ASSESEMENT ON CONTAINER HANDLING SERVICE PERACTICE AND ITS AFECTING FACTORES;

THE CASE OF MODJO DRY PORT

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DECLARATION

I, the under signed, declare that this thesis entitled "**ASSESEMENT ON CONTAINER HANDLING SERVICE PERACTICE and ITS AFECTING FACTORES**: A case study on Modjo Dry Port", is my original work and to the best of my knowledge has not been presented for a degree by any other person, and that all the sources of material used for the thesis have been duly acknowledged.

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Amare Tigabu Yigzaw

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This is to certify that, the thesis prepared by Mr. Amare Tigabu Yigzaw entitled. "**Assessment on Container handling service practice and its affecting Factors** : A case study on Modjo Dry Port". a thesis submitted to Addis Ababa University, school of commerce, department of logistics and supply chain management in partial fulfillment of the requirements for the award of the degree of master of art in logistics and supply chain management is complies with the regulation of the university and meets the accepted standards with respect to originality and quality.

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Table of content

Contents **Page**

List of Abbreviation and Acronyms

ASYCUDA – Automated System For Customs Data

C& F– Clearing & Forwarding

CFS - Custom Freight Station

CCC - Customs & Clearance Charges

CDT- Container Dwell Time

EDMTA Ethio-Djibouti Multi Modal Transit, Transport Agreement

DO – Delivery Order

DEA- Data Envelopment Analysis

ESLSE- Ethiopian Shipping and Logistics Services Enterprises

EDI – Electronic Data Interface

FEU – Forty Equivalent Unit

GRT- Gross Registered Tons

GDP – Growth Domestic product

ICD - Inland Container Depot

IMF- International Monetary Fund

ICD - Inland Container Depot

KPIs - Key Performance Indicators

LLDCs Landlocked Developing Countries

LPI Logistics Performance Index

MOT – Ministry Of Trade

NRT Net Registered Tons

NVOCCs -.Non –vessel Operating Common Carriers

RMG – Rail Mounted Gantry Crane

SPSS – Statically Package For Social Science

SPSS- Statistical Package for Social Sciences

TEU- Twenty foot Equivalent Unit

UNESCAP- United Nations Economic and Social Commission for Asia and the Pacific

UN-OHRLLS- United Nations Office of the High Representative for the Least Developed Countries, landlocked Developing Countries and Small Is island Developing States

ABSTRACT

Previous studies published thoughts that dry port container handling service Practice can be affected by many factors and this study revealed that factors such as insufficient port yard equipment, dwell time, container cargo volume and truck turnaround time, custom clearance, limited storage capacity, poor logistics connections to hinterland and infrastructure directly influencing performance of container handling service in the port yard. Datche (2015) ,and Nyma (2014)

This study has been tried to assess container handling practice and Its affecting factors at Mojo port and terminal. To undertake the study primary and secondary data had been collected secondary data is collected from mojo operational data base and the enterprise statistical bulletin publishes on (2011EFY) and primary data is collected using questionnaire survey that had been built taking into account all the considerations expected to be factors and contributors to performance of container handling service specially on container yard capacity , container dwelling time on the dry port , port machinery equipment productivity and availability , port infrastructure, custom processing time, of the dry port data will be Tangible, Reliability, Responsiveness, Assurance, and Empathy. Further, customer's perceptions were considered to assess Customer looking on the dry port container handling service time performance. A sample of customers, employee and custom employees at mojo port were selected using purposive sampling technique. In addition, the data was analyzed using descriptive statistics research design approach Marczyket.al. (2005). The statistical methods of analysis included a descriptive statistics (frequency, mean, percentage) and text explanation , factors of analysis and the results are presented in different way, i.e.;- chart , graph, figures , table some other mechanism to show the real impact and factors of the variables on performance of container handling service. Finally we found from the study magnitude of the problem and gap , identify the real factor affecting performance of container handling service.

Key Words:- *Dry port , Dwell time , custom processing time, port yard capacity , port machinery productivity , container handling service , performanc*

CHAPTER-ONE

INTRODUCTION

1.1 Background of the Study

Today in the global competitive world Logistics service providers as a business company facing difficulty with regard to maintaining and improving profitability with the base of business continuity . The leadership of these companies are being forced to seek and implement innovative strategies with which to advance their company's competitive improvement as well as their profitability. (Stock & Lambert, 2001).Improved and efficient logistics service will make a country's products more attractive from a cost and customer service point of view in the global village and becomes one competitive advantage of the nation's economy in the global market.

The concept of integrated and interrelated logistics arrangement and management is key to the success of a particular supply chain, where integrated logistics management is the administration of the various logistics activities as an integrated system, moving cargo through a constant and consecutive chain/network of value-added steps, with it arriving when needed in the proper quantity and form, at the customer. (Gattorna & Walters, 1996; Stock & Lambert, 2001)

Improved and efficient logistic activity performance as separate functional activities and there integration effect is the critical factor in the total effectiveness of the logistic service. From this logistic activities efficient dry port container handling service performance is one of them expected to be achieved .

Ports are well known as playing an important role in integrated logistic service specially on multimodal transport systems on the international supply chains, apart from their traditional role as clusters of economic activities. Ports engage in various activities: stevedoring (loading/discharging)cargo onto/from tracks , train or track at ports ; providing value- added services like labeling, packaging, consolidating , and acting as warehouse and distribution centers (World Bank, 2007). Ports add more value to shipments that are in the port area by further integrating themselves into value chains. Many ports are increasingly being perceived as integrated and inseparable nodes in their customers' supply chains. Ports play a critical role in the effective and efficient management of the industry.

A dry port container terminal is a zone of the port where containers are loaded, unloaded and stored in a buffer area called yard. Inbound containers are unloaded from container careers train; track by cranes or reaches stacker and then transported by internal trucks to storage yard where

they are stacked by yard cranes to their allocated positions waiting for the consignees to pick up. Since 1990s, world container traffic has been growing at most three times world GDP growth, due to the offshoring of manufacturing operations in world. Port throughputs increased even faster because an increasing number of containers are transshipped. Efficient port operations that maximize the throughput (ports are paid by a handling charge per container) are essential for port operators' profits. With advancements of quay side equipment and technologies (e.g., twin 40-ft quay cranes, indented berths, etc.), the bottleneck of the port operations has moved from quay side to yard side.

The yard management of a port has significant influences on the competitiveness of the port in global logistic service and. Performance of container Terminal at the dry port that can be reflected in the longer cargo dwelling time and its manifestation of higher port handling service cost to pay by customer reduce the attractiveness for them to be a hub for the supply chain at a port.

Tongeon and Ganesalingam (2009) acknowledged several indicators of terminal productivity and pigeonholed them into two broad categories , that are namely: operational view efficiency measures and customer-oriented view measures. The first set of measure deals with capital and labor productivity as well as asset utilization rates. The second set includes direct charges or cargo or goods handling costs , container or goods waiting time, minimization of delays in inland transport (Tongzon and Ganesalingam, 2009).

Ethiopian shipping and logistics' service enterprise (ESLSE) is offering integrated logistic transport services to shippers and consignees, whereby cargo delivery and pick up can take place at one of the dry ports in Ethiopia. These dry ports act as an extension of the seaport and are customs bonded areas. Modjo Dry Port is the biggest one and one of the most important dry port at the moment that handle most of the country foreign trade import and export containerized cargoes , but ESLSE, also by order of the Ethiopian Maritime Affairs Authority (EMAA), developed other seven dry ports to set setting up a network of dry ports in the country to ease congestion at Modjo Dry Port .

As per operational manager of Modjo Dry Port (Mr Solomon) Even if , Mojo dry port is exceling its capacity development through time by developing additional terminal area to handle growing imports and exports containers , and The port is operating at maximum capacity for containerized cargo, but it is suffering progressive declines in operational effectiveness unless terminal efficiency issues are urgently addressed.

In term of efficiency, several key issues need to be addressed for both imports and exports that relate to movement of containers through the port, and inefficiencies caused by the management of trucks loading and unloading , processing of custom duties, man power productivity ,port machinery productivity and storage dwelling time , etc

The operational capacity for container cargo is particularly relatively acute with the growing demand in containerized cargo; even if mojo entry Port has faced serious capacity problems (ESLSE, 2010). Short-term immediate impact is an increased port congestion surcharges, un necessary cargo resifting work and slower throughput of the port (when congested) thus causing significant cargo delays or long cargo doweling time and higher costs to importers.

Exporters also experience increased costs because of possible unscheduled delays at the port, inefficient consolidation work, and those disappointing customers who have based their own business decisions on fixed delivery schedules.

Due to this the study cared out to identify and evaluation factors affecting performance of the container handling service for the import and export containers, in order to carry out the container handling operations in the most efficient way.

1.2 Statement of the Problem

According to World Bank's Logistics Performance Index and Ease of Doing Business(2016) reports that demonstrate the severe difficulty Ethiopian importers (and exporters) experience when it comes to making logistic arrangements that is characterized by poor logistics service provision and lack of coordination of goods transport, low level of development of logistics infrastructure and inadequate fleets of freight vehicles in number and capacity , inefficient cargo management at both sea and dry ports that leads to damage and quality deterioration of goods while handling, transporting and during at the storage yard .

As a result of the governmental multimodal transport arrangement, ESLSE has a more than significant influence on the logistic arrangements within in the country. The logistics chain, ranging from the Port of Djibouti, to inland transport, to Ethiopian dry ports and all the way up to the end user, comprises of many activities. ESLSE performs many of these activities and can be regarded to be a full range logistics service provider.

Many landlocked and developing countries are facing the challenge of supply chain related barriers from the sea and to high costs of trading with the rest of the world (United Nations Economic Commission for Africa, 2011). to counter the challenges of absence of sea port , the dry port concept and new insight is emerged . Dry ports also evolved out of the challenges that faced existing sea ports i.e., due to the increase in caring capacity of container vessels, sea ports increasingly faced inability to handle import and export cargo in a regular manner. This resulted into creation of congestion at different sea ports that also a Couse of long waiting time of trucks and haulage vehicles (Woxenius , Roso, & Lumsden, 2004).

The major Couse for the establishment of multi-modal transportation system in Ethiopia are the problems of freight transit coast, freight delays and safety of freights leaving absence sea port of the country . Ethiopia, as a landlocked country, used Ethio-Djibouti corridor as major trade route along . The Ethio-Djibouti corridor is a main outlet to the seaport. It is the main route for Ethiopia's import and export trade which is dominated by freight transport. Ethiopia has moved to establish various inland dry ports. This move will help the country save foreign currency by mitigating demurrage charge that are paid at sea port. ESLSE also offers on carriage possibilities to inland dry ports such as Modjo/Adama, Semera, Kombolcha, Dire Dawa, Mekele, gelan and Comet (Addis Ababa) and customer's bonded warehouse for containers cargo .

Mojo Port and Terminal operational director mr Dereje Mideksa said that, 80% of the national import accommodated at this port. The holding capacity of the Modjo Port has also improved

from 950 to 22000 containers. The port is under massive expansion work on additional 88 hectares of land to meet international standard. Currently, the port covers 31.s hectares of yard capacity.

Even if , Mojo dry port has exceeded its design capacity and yet it is exceling its capacity development through time by developing additional terminal area to handle growing imports and exports containers in addition to operating at maximum capacity for containerized cargo; the mojo entry Port had faced serious yard capacity problems on container handling service (ESLSE report , 2010). That has an impact on increasing of port congestion surcharges, un necessary cargo resifting work and slower throughput of the port (when congested) thus causing significant cargo delays or long cargo doweling time and higher costs to importers. Exporters also experience increased costs because of possible unscheduled delays at the port, those cumulatively disappointing customers who have based their own business decisions on fixed delivery schedules.

All these are some of the major problems that customers and the enterprise have faced in the dry port on container handling service provision. In order to implement effective and efficient dry port container handling service it is necessary to assess the existing challenges , and improvements on container dwelling time together with factors affecting for existence of long dwelling time and constitution to the low level performance of container handling service .

Therefore the study is concerned at mojo dry port on assessment of factors affecting performance of container handling service practice , hence to identify and address some major gaps on service delivery time and factors affecting for existence of long dwelling time in the port within the container handling service process.

1.3 Research Questions

The study is design to provide answers to the following research questions:

- ✓ How does dwell time affect performance of container handling services?
- ✓ How does port equipment productivity affect container terminal efficiency?
- ✓ How does infrastructure capacity influence performance of container handling service?
- ✓ How does work force competency influence performance of container handling services?
- ✓ How custom processing time does affects performance of container handling services?

1.4 Objectives of the Study

1.4.1. General Objective

The general objective of this study is to assess contributing factors that affect performance of container handling service at mojo container terminal .

1.4.2. Specific Objective

The specific objectives of the study will be:

- ✓ To assess the role of dwell time plays on container terminal efficiency.
- ✓ To assess the impact of port machinery productivity on performance of container handling service at in Modjo Dry Port.
- ✓ To examine the impact of infrastructure on container handling service.
- ✓ To assess the effect of clearance procedures has on container terminal efficiency of container handling service.
- ✓ To assess human competency factors related to container handling service .

Justification

This study is indeed significant because the effective logistic service provision plays a major role toward the economic growth and development of a country. The Port of Mojo has a strategic importance far beyond the borders of Ethiopia and port Djibouti. Moreover, the study seeks to benefit all stakeholders and players within the logistics service especially container handling service operators and policy makers because the findings from the research will provide an in-depth knowledge on practical implications on factors affecting container handling service on the container yard . The findings will also be a direction for future research and practical implications as well, especially to those who want to do similar research by assess factors affecting container terminal efficiency within industry.

1.5 Significance of the Study

Despite its significance to dry port container handling service performance improvement as a dry port study it is a new phenomenon to the country there are few studies conducted in the area. Hence, in view of the important role, those dry ports have to the whole supply chain and to entire economy of the country; it is worthy to study factors that affecting the performance of containers handling service in the dry ports.

Therefore, this study cared out to identify the major factors that affect the performance of

container handling service of Mojo dry port. In addition , it will have practical importance to others concerned unites by providing information and guidelines for the implementation of port policies development and organizational reforms which enhance service improvement, in turn reduce avoidable costs like storage and demurrage meantime increase the performance of the dry ports container handling service .

1.6. Scope of the study

The scope of the study conducted on Mojo dry port because out of the sight inland dry ports Mojo covers from 75 to 80 percent of multimodal container throughput. The study engaged in identifying users' perceived factors that could affect performance of containers handling service specially on service delivery time that is dwelling time and impact of port machinery equipment productivity , customs process , man power competency, factors to the long dwelling time of the Mojo dry port .

1.7 Limitations of the Study

The study is focus on mojo dry port container terminal handling practices on factor affecting performance of container handling service. Therefore, it has note gave any general information about mojo terminal other service like warehouse service and other terminal service of the enterprise and had not assesse the enterprise.

In addition, the study has faced challenge to get secondary data on container weighting time of the current year that drives the researcher to focus on correctional survey method that made researcher to collect container data on specific date that has relatively accurate data on container waiting time.

1.8 Definition of Terms

The definition of terms related to the topic is significant in helping readers to easily understand the concepts of these terms; they're interrelated elements, and relationships to each other, implications to circumstances and their impact to each other and other related variables. The following key terms will be are defined : logistic service ,dry port , container yard , container terminal , Key Performance Indicators (KPIs) , Yard capacity , Container dwell time and other relevant terms of the container handling service sector is defined on the study from this the major ones are presented below

Logistics:- plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services, and related information between the point of origin and the point of

consumption in order to meet customers' requirements " Council on Logistics Management

Port are well known as playing an important role in integrated logistic service specially on multimodal transport systems on the international supply chains, apart from their traditional role as clusters of economic activities. Ports engage in various activities: loading/discharging cargo onto/from tracks, train or vessels at sea and at dry port ; providing value- added services such as labeling, packaging, consolidation , and acting as warehouse and distribution centers (World Bank, 2007)

Dry Port: Defines a port as an intermodal interface. It is an area where there are facilities for handling cargo and where there is equipment for the transfer of goods from truck/train to yard or vice versa.

Container terminal:- is a zone of the port where containers are loaded, unloaded and stored in a buffer area called yard. Inbound containers are unloaded from container careers train track or vessel by cranes and then transported by internal trucks to storage yard where they are stacked by yard cranes to their allocated positions waiting for the consignees to pick

Containers: Containers are large boxes used to transport goods from one destination to another. They are designed to facilitate movement of goods without intermediate reloading. Goods in containers require less packaging, are less likely to be damaged and result in higher productivity as compared to conventional bulk cargo (Huynh and Walton, 2005).

Transit container: Container destined for a transit state. The transit state is defined as a country through which container passes en route to destination country.

Dwell time: Manalytics (1979) as cited by Merckx (2005) defined dwell time as the average time a container remains stacked on the terminal and during which it waits for some activity to occur. According to this definition, dwell time also refers to the efficiency of terminal operations. The shorter the dwell time the more efficient they performed operation and vice versa.

Free storage period: Kgare et al. (2011) defined it as the time from when the vessel completes discharge/cargo arrived in dry port and the container is stored in the port area until collection for a specified period without incurring any port storage charges. Import: Goods brought into the country from oversees as final destination or transit to other countries.

1.9 Organization of the study

The paper organized by five chapter's portions. Chapter one discusses the introductory part which comprises Background of the Study, Statement of the Problem, Research Questions, Objectives of the Study, Delimitation/Scope of the Study , Significance of the Study, the study definition of Terms.

The second chapter included review of related literature that contains the relevant literature compiled as related to the study. The third chapter describes the Methods of the Study, which covers the research paradigm, research approach and design, the population and sampling techniques applied, types of data used and the tools/ instruments adopted to collect the data, the procedure of data collection and methods of data analysis.

The fourth chapter contains about demographic data, the dissemination of the research results/ findings and discussion of those results.

Finally, chapter five addressed about the summery and conclusion of the research findings recommendations which aimed at addressing the research questions on the statement of the problem and the researcher advice for further future study on the study area.

CHAPTER-TWO

LITERATURE REVIEW

2.1. Introduction

The second chapter asses and reviews relevant literature both about the topic of the research with specific focus on other related issues with the study area like dry port and container handling service concepts and mainly on factors affecting performance of container handling service . Some number of existing papers and previous studies on factors affecting performance of container handling service and related issues were reviewed for this study. The frame reference of this research project was guided by the problem and contributors approach . Hence, it was considered relevant in this research to review theory related to factors affecting container handling service . empirical literature review shown numerous theoretical perspectives on performance of container handling service and its hypothesized variables factors that affecting its , empirical review ,conceptual framework, summary.

2.2 Definitions of logistics, port and, Dry port concept.

Ports are the link between land and sea. Port terminals includes port yard , port particular equipment and machinery needed to perform cargo operations (Alderton, 2009) and port operation stuff in addition to port infrastructures like management system , office facility and working structure . It is also importance that port terminals can support logistic supply chain with the cargo handling services needed in a reliable and flexible way and with executable low cost .

According to (Panayides, 2006). Dry port terminal includes: supporting systems for port entry; stevedoring (loading and unloading); transit; storage and inland transport connection. As well as economic sector grow larger and amounts of cargo to be handled increases so must also port terminals develop to support the trade (Institute of Chartered Shipbrokers, 2013a). To be able to compete a port terminal needs to apply strategies to create operational effectiveness and service effectiveness. Port terminals compete by advancements in technical, logistical and operational management (Steenken et al. 2004).

There are many definitions of dry port, from this according to UNCTAD (1991) dry port is “An inland terminal to which shipment companies issue their own import bills of lading for import

cargos assuming full obligation of costs and conditions and from which shipping businesses issue their own bills of lading for export cargos."

Dry ports could also be defined as inland terminals within a country that has a gateway port or they could be located in adjacent land-locked countries in the hinterland of one or more sea ports. The concept came into wide spread use in conjunction with containerization and this is the context in which the term is used here.

Dry Port or Inland Clearance Depot (ICD) defined port as: " A common user facility with public authority status, equipped with fixed installations and offering services for handling and temporary storage of any kind of goods (including containers) carried under customs transit by any applicable mode of transport, placed under customs control and with customs and other agencies competent to clear goods for home use, warehousing, temporary admissions, re-export, temporary storage for onward transit and outright export." (UNCTAD, 2002) .

Another definition of Dry port states that; "an inland intermodal terminal directly connected to seaport(s) with high capacity transport mean(s), where customers can leave/pick up their consistent units as if directly to a seaport." Rosoet al. (2009) . and also A dry port can be agreed as an inland setting with cargo-handling facilities to allow several functions to carry out, for example, cargo consolidation and distribution, temporary storage of containers, custom clearance, connection between different transport modes, allowing agglomeration of institutions (both private and public) which facilitates the communications between different stakeholders along the supply chain, etc (Ng and Gujar, 2009).

By simple expression, dry ports are explicit zone or site to which imports and exports can be consigned for inspection by customs and which can be specified as the origin or destination of goods in transit accompanied by documentation such as the combined transport bill of lading or multi-modal transport document to facilitate the logistic supply chain .

Dry ports are sited inland from sea ports but are connected directly to the sea port(s) or, in the case of worldwide land arrangements, are in contact with the sources of imports and destinations of exports. Dry ports may be used whether a country has sea ports or is land-locked, but only surface modes of transport are involved in giving access to them. In general, a dry port conducts functions very similar to contemporary seaports, especially its role as the distributional nodal points along intermodal supply chains (Meersman, et al. 2005).

As a major part of the worldwide transportation systems, ports are not solely independent and natural area for the transfer of physical goods, but also a systematic element of (often multimodal) logistical supply chain (Gujar, 2011). Therefore, the role of a dry port and container handling service within this system is becoming particularly important. Due to the roles of dry ports in the organization of materials and information flows; minimization of costs; as well as reliable cargo handling which is becoming critical as a practical part of the global logistics and supply chain administration.

Merits and potential benefits of dry ports are summarized by UNCTAD (1991) as follows:

- ✓ **Facilitate trade flows:** beneficial to a region or to the country as a whole.
- ✓ **Reduce door-to-door freight rates:** the consolidation of consignments and the greater use of containerization can contribute significantly to the introduction of lower through-rates. Containerization offers numerous advantages.
- ✓ **Reduce of clearing and forwarding agents' fees at sea ports:** These fees may be completely avoided where a dry port allows the use of combined transport bills of lading or multi-modal transport documents. This is so when such documents are issued by a shipping line because the shipping line takes responsibility for the passage of goods through the maritime port. Hence the importer or exporter does not need to employ a clearing and forwarding agent.
- ✓ **Reduce or Avoidance of storage, demurrage and late documentation fees:** In traditional transit systems, goods are frequently held up at maritime ports or at land borders owing to the absence of documentation (such as ocean bills of lading or commercial invoices), minor irregularities in existing documentation, prepayment of handling charges in foreign
- ✓ **Increase communications:** Simple, rapid transfer of documentation and information, important to efficient cargo transit, may be achieved by linking the introduction of high-tech freight tracking or customs clearance to the provision of a dry port.

2.3 Theoretical Literature Review

Ports have continuously had an important role in the economic development of national and international trade of countries, currently challenged by globalization, with implications for sustained economic development of their regions (Gaur, 2005). Globalization, emerged from trade growth between continents, regions and countries, has led to an expansion of global sea trade with huge impacts for ports. Increasing competition between transport modes and growing capacity per unit of transport demand for higher performance level in ports, which largely depend on their characteristics, such as infrastructure, equipment, governance structure and integration in logistic networks (Caldeirinhaet al. 2011).

With the development of global supply chains, dry ports have been assumed increasing importance to suit the need for market development, smooth integration and closer collaboration between the different participants of the supply chain and transport network. Thus, it is a natural outcome for the ports to extend the services to locations situated further hinterland by either condescending, forming planned alliances or buying out existing dry ports so as to enhance the supply chain (Lee and Kim, 2003).

The capability of nations to deliver and/or receive goods and services on time and at the lowest probable cost is a key factor of combination into the world economy today. Logistics services which include activities required for the transportation, storage and handling of manufacture inputs and finished goods from manufacturers to customers(or intermediary producer), play a vital role in global trade (Caldeirinhaet al. 2011). Consequently, the efficient supply of logistics services helps to facilitate international trade. Hence, the more timely, reliable and efficient the logistics supply chain, the more efficiently and reliably goods can be delivered from the point of manufacture to the point of consumption (Tilahun, 2014).

Thus as inter land logistics service centers, dry ports are playing an increasingly pivotal role in the multimodal transport network that sustains economic activity by delivering key inputs to local companies and simplifying their exports of raw materials, semi- produced goods , and completed goods (Sanchez et al., 2003).

In a modest business environment, the presentation of a container terminal is determined by several factors, such as the market of the region where it is located, the physical and

organizational capacity, the integration in the logistic networks, the level of competition, maritime and inland accessibilities, the type of handling equipment used at the quay and parking areas, the liner shipping services and inland networks to which they are connected (Tongzon&Heng, 2005).

Port performance measurement is a challenging issue for most ports. The improved use of containerization and supply chains, the development of new production-distribution-consumption systems and increased specialization of the different port markets have all affected port association organization and operation (Notteboom and Rodrigue, 2005). Sympathetic the levels of performance achieved is at the core of the strategy of port authorities and operators, in order to deploy strategies that address the needs of port users, increase competitiveness, and thus market shares.

According to Khalid & Richard (2004) measures of port efficiency or performance indicators use a diverse range of techniques for assessment and analysis. UNCTAD (1982) suggests two categories of port enactment pointers: major performance indicators calculating aggregate port impacts on economic activity, and minor performance indicators evaluating input/output ratio measurements of port operations. As per Khalid and Richard (2004) there are many ways of quantifying port container handling service productivity, which could be classified in to three broad categories which are: physical indicators, factor productivity indicators, and financial and monetary indicators.

- **Physical indicators** generally refer to time measures and are mainly concerned with the container (e.g. track turnaround time, yard occupancy rate, co-ordination with other factors like transport is measured, e.g. cargo dwell time or the time elapsed between cargo being unloaded from a ship until it leaves the port.

- **Factor productivity** pointers also tend to focus on the maritime side of the port, for example to measure both labor and capital required to load and unload goods from a ship. Similarly, economic and financial indicators are usually related to the sea access, for example, operating surplus or total income and expenditure related to gross registered tons (GRT) or net registered tons (NRT), or charge per twenty foot equivalent unit (TEU).

Most port authorities and operators have made significant infrastructure investments in order to reduce operational costs and improve service quality, which are important factors that impose terminal performance (Cullinane and Wang, 2009). Additionally, investments in inland accesses

are very important to expand the hinterland and contribute to improve port performance. Inland accessibility and terminal hinterland are driven by transport costs, alternative modes, capacity and quality of inland connections and transport service quality, as well as integration on the main land transport networks or at the crossroads of inland trade routes.

Moreover, De Langen (2004) argued that coordination between the active players of both hinterland network and port is necessary. The port service quality depends on the performance of many players, including port operators, freight forwarders, container operators and port authority and that influences the overall port performance. Port terminals increasingly seek to improve service quality and hinterland connectivity in order to meet the logistic network demands (Notteboom and Winkelmans, 2004). Besides improving the service quality, ports and terminals should also contribute to improve competitiveness and performance of the supply chains in which they are integrated (Tongzonet al., 2009).

Robinson (2002) reported that port choice has become a decision made within the entire network and therefore the competition is no longer between ports but rather between supply chains, which calls for a wider approach beyond port and terminal selection criteria. This means that shippers tend to choose the logistic networks which fulfill their requirements in terms of costs, transit times, efficient handling, productivity and reliability, connectivity and interoperability (Tongzonet al., 2009).

The notion of port performance is notably accompanying with operational issues, i.e. the efficient use of infrastructure, superstructure, and all other resources used. This association has for long affected the structuring of port performance measurement frameworks. The majority of the indicators, or relevant exercises, applied are constructs dealing with the operational productivity of the assets, equipment and productivity factors available (Brooks et al, 2011). Contrary to what is observable in other service industries, attention on the demand side reflections, i.e. the users point of view, has been a recent phenomenon (Brooks and Pallis, 2008; Brooks and Schelling, 2013).

Revising its strategy in 2007 the European Commission (CEU, 2007) mentioned that port users and their views are important elements in the whole process and deserve further attention – endorsing in essence that port performance is a construct of two components, namely efficiency and efficiency (Brooks and Pallis, 2008; Brooks et al, 2011; Brooks and Schelinck, 2013).

The World Bank's study "Logistics Performance Index" is broader than a study of ports alone, and measures logistics instead. Yet the study is interesting as it includes port users' evaluations on specific factors dealing with logistics performance, as well as a framework on how to measure them. The Logistics Performance Index measures on-the ground trade logistics performance based on six dimensions: timeliness, international shipments, tracking and tracing, customs, infrastructures and services quality.

In doing so, World Bank (2012) developed two standardized questionnaires as a means to gather the data needed. The first one is the international questionnaire which request for an assessment of six key areas of logistics performance and more specifically:

- Efficacy of the clearance process by border control agencies (including customs).
- Quality of trade-and transport-related infrastructure
- Ease of arranging competitively priced shipments
- Competence and quality of logistics services
- Ability to track and trace consignments
- Frequency with which shipments reach the consignee within the scheduled or expected delivery time.

Apart from the international questionnaire there is also a domestic one, in which the respondents are requested to provide qualitative and quantitative data on the logistics environment in the countries they work. The respondent has to provide data for 5 major categories of factors related with quality, cost and efficiency. Each category has some sub-indicators.

The customer focus is a critical issue for container terminal performance, because terminals need to show flexibility/agility in adapting new requirements and market changes, making the necessary adjustments to meet increased customer demands. In addition, a well-organized terminal layout can improve the terminal productivity and capacity and, consequently, affect performance and service quality, particularly when large vessels call demanding for large space areas.

2.4 Empirical Literature Review

Understanding performance is a concept essential to any logistics business, whether it is the measuring of accomplishments against set goals and objectives or, against the competition. Ports are no exception and it is only by comparison that performance can be evaluated. Ports are, however, a complex business with many different sources of inputs and outputs which make direct assessment among apparently homogeneous ports seem difficult (Valentine and Gray, 2002).

According to Sanchez et al. (2003) ports are a major determinant of shipping costs, proving the rank and the strong impact of efficiency on unit costs and competitiveness. Caldirinahaet.al (2011) on their study they focus on analyzing the impact of characterizing factors on the port performance, using operational, financial and efficiency indicators. Considering the multidimensional nature of port performance, the study aims to analyze which characterizing factors are relevant and what measure the relationships.

Nyema (2014) assess factors affecting container handling service with a case study of the Mombasa Entry Port using a descriptive survey design. This study revealed that factors such as inadequate cargo handling equipment, reducing berth times and delays of container ships, dwell time, container cargo and truck turnaround time, custom clearance, limited storage capacity, poor multi-modal connections to hinterland and infrastructure directly influencing container terminal performance .

Ruto and Datche (2015) study logistical factors influencing port performance taking Kenya port Authority as a case study. The study use survey research design and employs descriptive statistics analysis and summaries the causes of poor performance in the port of Mombasa according to the findings are: lengthy customs clearing procedures, rapid growth of container trade, frequent break down of Kenya Revenue Authority (KRA) and Kenya Ports Authority (KPA), IT Systems, slow gate out process and slow container off-take to Container Freight

Station, inadequate yard capacity and lengthy KRA clearing procedures, poor yard planning and in adequate usage of IT in yard planning, poor working corporate culture by the corporate staff and poor hinterland connectivity.

Currency, lapse of a bond, non-availability of onward transport, etc. in all such circumstances, storage charges beyond the permitted free periods allowed may accrue, or demurrage charges

and late documentation fees may arise. With a dry port and combined transport bills of lading, customs inspection at the maritime ports and at the borders of transit countries should be unnecessary or at least greatly minimized and many of the usual causes of delay at maritime ports will be removed. Storage costs, demurrage and late documentation fees will thus not occur.

- **Better utilization of capacity:** A dry port can reduce empty rail wagon or truck movements by acting as a consolidation center for return loads of export cargo. The consignment increase in load factor may enable some savings to be made in overall transport costs.
- **Greater use of containers:** the establishment of a dry port with container-handling facilities can encourage greater use of containers. In containerization cargo is carried in boxes of standard dimensions allows these containers to be handled mechanically, transferred from one mode of transport to another efficiently and without disturbing the actual cargo inside; owing to high unit volume and weight handled per move, the productivity of handling equipment and throughputs is many times greater than if the same volumes of cargo were handled in break-bulk fashion. This advantage, coupled with standardization of the dimensions of containers, has revolutionized general cargo transport and handling methods.
- **Lower customs staff costs:** As dry ports allow customs clearance to be concentrated at a few sites, it may be possible to effect the same volume of clearance with reduced customs involvement, especially where a dry port is accessed by two or more gateway ports.
- **Benefits to sea ports:** apart from lowering congestion, the establishment of dry ports also results in reduced handling of goods at related maritime ports. There is a reduction in demand for storage space owing to faster onward transit, saving in both capital costs of providing handling equipment and warehousing as well as in equipment maintenance costs. With greater containerization of transit cargos, maritime ports also gain the advantage of higher berth throughputs, thus reducing the cost per unit of cargo handled.

Tongzon (1995) tried to specify some factors that could influence port efficiency. He focused on determinants of port throughput, including as key parameters the location of the port, the frequency of ship calls, port charges, the economic activity and the terminal efficiency (which is in turn affected by container mix, the work practices, the crane efficiency and the vessel size and cargo exchange). The study employed multiple regression model and the result showed that

terminal efficiency, occurrence of ship calls and economic activities are important factors in influencing port performance.

Yeo et al. (2008) in their study tried to identify and evaluate the competitiveness of major ports in Korea and China and their study identifies the components influencing their attractiveness and presents a structure for weighing them. Based on the literature related to port selection and competition, a regional survey of shipping companies and owners employed factor analysis to reveal that port service, hinterland condition, availability, convenience, logistics cost, regional center and connectivity are the determining factors in these regions.

Rajasekar and Deo (2014) tried to identify the contributing factors for port performance of major ports in India during 1993 – 2011. For recognizing the factors panel data models like pooled normal least square method, fixed effect model and random effect model are used. The results of the study indicated that berth output, operating expenses, number of employees, cargo equipment's and idle time showed significant effect on port performance.

Scholars examined with several explanations of performance, with users perception emerging as part of the relevant debate in the recent past. Ng (2006) asserted that, targeting the container ports in Northern Europe, shipping company considered the effectiveness of port, terrestrial location, and service excellence more significant than the cost of port. Also, Ng (2006) proposed that individual groups of port users showed different priority ranks for the significance of the select factors. Besides this, this study points out the fact that the select factors for port depend on the qualitative factors such as reliability, proximity, frequency, security, and reputation and cost factors.

Panayides and Song (2009) also recognized information systems, communication and informal relations in the supply chain as essential to performance, productivity and competitiveness of container handling service and entire supply chains and port networks. Information and communication systems can improve performance of the container handling service performance and operations contributing to achieve its purposes (Cachon and Fisher, 2000). Furthermore, information sharing is regarded as an effective way to contribute to improve container terminal integration in the supply chains. It allows companies to improve safety, reliability in a faster synchronized process with impacts in terms of costs and service quality (Zhao et al., 2002)

because information systems avoid duplication of documents, maintain data integrity along the transport chain and reduce costs.

Turner et al. (2004) examined the impact of hinterland and maritime accessibilities on performance and Gaur (2005) identified factors that affect the container terminal performance, including maritime access and hinterland connectivity.

In general, the performance of a container handling service in dry port has a multivariable behavior. According to Brooks and Pallis (2008) port performance research can be divided into effectiveness research and efficiency research. Efficiency has been noted as 'doing things right' while effectiveness is 'doing the right things'. The right things are those that are important to the customer. If a negative and significant gap exists between the importance of those right things and the performance of them, dissatisfaction is the by product. In combination, these two port performance components also provide government policy-makers with the essential feedback for assessing the governance structure of ports in meeting national strategic objectives.

2.5. Factors affecting Port Performance of container handling service

In order to study the factors that have contribution on determination of performance for container handling service , we should first identify the major indicators of port performances of container handling service . Since the environment in which ports operate has changed dramatically, ports are affected by various new forces driving global competition, including the far reaching unitization of general cargo, the rise of mega-carriers, the market entry of logistics integrators, the creation of network linkages among port operators, the development of inland transport networks, and so on (Notteboom and Winkelmans, 2001). In this context, seven key determinants of port performance of container handling service are proposed based on the existing literature. These determinants include: cargo handling equipment, port infrastructure, customs operation, size of dry port, competences of the port operating staff and port operations service time performance result that determined from together or partly, separately or all together results of the above factors that is long dwelling time that is also another factor and performance indicator of container handling service .

2.5.1. Terminal yard capacity and container volume

Containers should not be transferred directly between the quayside and inland transport. A storage yard has to be provided at the terminal for in-transit storage of containers while all the

administrative procedures are involved. Up to 70% of the terminal area is assigned to stacking, while the other terminal areas occupy only about 25%. The amount of space needed for handling and storage is not only related to the number of containers throughput but also the time that a container can expect to remain in the stacking area; this is caused the Dwell Time which is obviously a very important factor influencing the land requirement of a CY. Dwell Times are not easy to establish, then, and it is not wise to predict an optimistically low value for the mean time spent in the port. It is best to be estimated on the basis of experience as far as possible. Dwell Times for imports, exports, LCLs, FCLs, empties, transshipment containers should be estimated separately.

However, all terminals have peaks and troughs in the container flow, so the average value conceals days when demand is lower than the calculated number of TEUs and others when it is higher. To overcome this problem, planners apply a Peaking Factor to cover these routine fluctuations in trade. Normally, some rule-of-thumb is applied, allowing perhaps 20% or 30% TEUs slots above those calculated as the mean daily demand. In practice, containers need to be separated into groups in the CY by type, by size, by ship call, etc, to allow easy access for in-terminal moves and operational flexibility. This extra space is allowed for by applying a Separation Factor. Usually, a figure of 20-30% is allowed as reserve. i.e., a Separation Factor of about 1.25.

After establishing stacking capacity in terms of the number of TEU slots, the space in the CY must be calculated, for containers are not normally spread out one high. The land area actually needed (expressed as Twenty-foot Ground Slots, TGS) will be calculated by dividing the stacking capacity by the stacking height. Thus, TGS required for the container terminal can be calculated by using the formula below:

Therefore A number of research articles consider the size of the container yard as one factor that influences their performance (Gujar, 2011; Nyema, 2014 and Calderinhaet al, 2011), since the land size determines the total storage capacity of a terminal . It is especially important in the peak season. Consequently, the size of a dry port is taken as one of the factors when we consider its performance.

2.5.2 . Port handling equipment availability and productivity

Port Equipment productivity: The value that is of interest is the number of container moves made per working hour, either for an individual machine or for the stock of a particular type of machine. And port Equipment utilization: one of the affecting factors in container handling service since the terminal's investment in cargo-handling equipment is very costly, equipment utilization is an exceptionally important performance measure. The utilization of any item or type of equipment is defined as the proportion of time that it was effectively deployed over a specified period.

Similar to seaports, container handling equipment are used in dry ports, which include rubber-tired gantry cranes, mobile cranes, top handlers, side handlers, reach stackers, forklifts and so forth. Usually container handling equipment are viewed as the main machines for dry ports as well as seaports, and they can greatly influence both the container handling capacities and, in turn, the performance of the dry port (Gujar,2011).

APM Terminals (2016) define productivity as an average of number of gross moves per hour for each cargo handling equipment. A move is considered to be a lift of a container either for loading, discharging or repositioning. The gross moves are explained as the sum of these three types of moves per hour. Gross Moves Per Hour, GMPH, are the gross moves handled divided by the hours for cargo operation as presented below.

$$\textbf{Gross Moves per Hour} = \frac{\text{Gross moves}}{\text{Total hours worked}}$$

This indicator does not deal with the factor several cranes can be used and therefore alter the result which can double if using two cranes instead of one. The indicator Crane Productivity takes this into consideration as presented below.

$$\textbf{Crane productivity} = \frac{\text{Number of containers handled by one crane}}{\text{Total hours worked with the crane}}$$

2.5.3. Infrastructure

According to Liu (1995) both speculation in port infrastructure and the capital-intensity level are other factors that can explain the differences in performance and efficiency between ports,

because without infrastructures or the ability to offer services, a port could not be able to handle an increasing number of cargo.

The quality of access to a dry port and the quality of the road/rail interface determines the productivity of terminal performance therefore it is necessary to have scheduled, reliable, transport by high capacity means to and from seaport (Rosoet al., 2008). Thus dry ports are used much more consciously than inland terminals with the aim to improve the situations caused by increased container flows, focus on security and control by use of information and communication systems.

2.5.4. Customs process time and procedure

Dry port can play a supportive role as it is a logistics center which can provide services such as handling, storage, stuffing/un-stuffing, consolidation, customs clearance and container maintenance. As customs practice involved in the premise of the dry port the customs procedure in the clearance of the goods have impact on the performance of the container handling service in the port.

2.5.6. Competency and number of staff

The competency and numbers of staff or the labor costs are also considered as a potential factor that may influence the performance container handling service of dry port (Guar, 2011). The number of employees is usually taken as a critical factor influencing businesses of dry ports as more staffs can handle the inbound and outbound containers or bulk cargos more efficiently especially in peak hours. Dry ports should have sufficient middle-level and front line managers as well as workers to handle the businesses.

2.5.7. Dwell Time (DT)

Dwell Time (DT) is defined as “the total time a container spends in one or more terminal stacks. (Ottjes, et al., 2007). Containers dwell time must be influenced by several factors as gate operations, availability and efficiency of hinterland connections and customs regulations. Consignee, namely the receiver of the cargo can be identified as one of the key stakeholders who determine dwell time (DT) since he decides when to pick-up import containers or when to deliver export containers.

Container dwell time is one of the many performance indicators to assess the productivity of terminal operation. As compared to standard indicators such as ship turnaround time or productivity indicators it is however not yet widely used for global benchmarking purposes. It is therefore challenging to define average limits above which dwell time would be considered too long in any given seaport. Maritime industry sector experts tend to agree however on a 3 to 4 days representative average value (Goardon, 2003).

Long dwell times don't just have a negative impact on container terminal operations, the inefficiency cascades down the line, contributing to inflated storage fees, greater inventory holding costs, tied up working capital, and an inability to set up reliable Just-in-Time (JIT) procurement and manufacturing operations for importers. And Container dwell time in storage yards or ports is an old but persistent operational issue for global logistics operations. Dwell times vary from facility to facility and so do the factors that lead to them. Most issues, however, usually boil down to one or more of the following reasons:

2.5.8 Components of Dwell time and its deterministic factors

Average dwell time is a combination of three Dwell time named operational, transactional and storage dwell times.

Operational dwell time is The total time for the physical transfers only plus the necessary idle time between operations is defined as operational dwell time (UNCTAD, 2003). It is affected by

- **Infrastructure;** Extensive researches have so far been done on this as single most determinant factor of higher dwell time at container terminals. Issues looked into include:
- **Inadequate Port Capacity**: The volume of the cargo being handled at the port has been increasing especially with emergency of containerization while the infrastructure has remained the same over time. This leads to congestion and difficulty in handling cargo in time.
- **Poor transport system within the Port and immediate hinterland**: Very few ports are directly connected with reliable railway system. Those lucky enough to have intermodal link, the railways have been ailing; forcing customers to opt for trucks. Trucks pose another challenge in the hinterlands and the ports alike.
- **Inadequate cargo handling equipment**: cargo handling equipment like gantry cranes, reach stackers and Gottwaldov cranes are very expensive and most terminal operators

cannot afford them adequately. This causes delays due to waiting for handling equipment (India Secretariat for the Committee on Infrastructure, 2007).

Transactional dwell time. Transactional dwell time mainly concerns the transaction activities processing time between the importers/port services and customs procedures affected by

- **Custom Clearance :-** The imposition on operations of custom clearance procedures at ports and in transportation is well established (Clark, Dollar and Micco 2004, Haralambides and Londoño-Kent 2004), and One of the first definitions of dry ports, Inland Clearance Depot, (UNECE 1998) specifically accounted for the provision of customs clearance services. These facilities are defined as inland intermodal terminals dedicated to the handling and storage of goods under custom transit. The typology of operations performed in dry ports differs globally but typically include good clearance for temporary storage for onward transit, export, warehousing or import. The provision of custom clearance and quarantine services imposes high security procedures for retrieving the dry port, similarly to seaports, and subject on the country may include high fencing, cameras and guards (Roso and Lumsden 2010).
- **Paperwork & Container Transfer** It can take a while to complete processes to secure clearance for imported containers, arrange for customs dues and clearance charges, and complete an intermodal transfer. Additional time is required for container ports with inland container depots or "off dock" container storage yards (referred to as ODCYs) to transfer containers from a port to the secondary storage yard.
- **The Cost of Release — Customs & Clearance Charges** Container dwell time is sometimes due to issues with liquidness. Transporters are often short of cash, and they tend to reduce financial exposure as much as they can, disbursing customs and clearance fees only after they've secured a buyer for their cargo, or borrowing capital only when necessary, usually after a container arrives. Shippers are willing to leave cargo containers in terminals or off dock container yards if they can't pay all port clearance charges and fees in advance. Local cargo at the Port may remain on the terminal site longer if shippers determine that the Port's container yard is a cheaper or more convenient storage location for their inventory than their own property thus they may delay to clear the import.
- **Port Policies and Management:-** Moiniet al., (2012) argue that Port policy and management can have a direct impact on container dwell time. For example, agreements

between container terminals and shippers specify the allowable free period for a container before demurrage fees are incurred. The amount of demurrage fees to be paid after elapse of the free time can also determine whether the customer leaves the container as the cheaper alternative as opposed to taking out the cargo to a private warehouse. Other factors related to port policies and management include intricate clearance procedures, statutory inspection of containers and degree of computerization for documents transfer (India Secretariat for the Committee on Infrastructure, (2007).Again here the questions of free storage and discretionary behavior are insinuated as suggested in the first theory of warehouse-derived terminalisation of supply chain.

Storage dwell time. :- storage dwell time is the use of the port as storage warehouse by importers or their agents and affected by

- **Lower Storage Costs at Ports or Terminals:** Container terminals offer a "free time" for storage, usually between 3 – 15 days, depending on the facility's congestion and usual throughput, and shippers take full advantage of this free time. Even after the free time expires, storage, demurrage, and congestion fees levied can still be far lower than the cost of transferring and storing containers at private or third party container storage facilities. The lower overall cost for storage is a compelling incentive to use ports or container terminals as cheaper storage to lower total logistics costs.
- **Infrastructure:** The critical role that container infrastructure plays in favoring the economic development of a country or region is well established. Infrastructure is the necessary condition for efficient cargo handling operations and adequate infrastructure is needed to avoid congestion, foster trade development as well as securing deep-sea container connectivity for economies heavily dependent on international trade. Container infrastructure, however, needs to be complemented by efficient hinterland transport connections if the port is to fully exploit its potential as growth catalyst and supply chain node (Suykens and van de Voorde 1998).

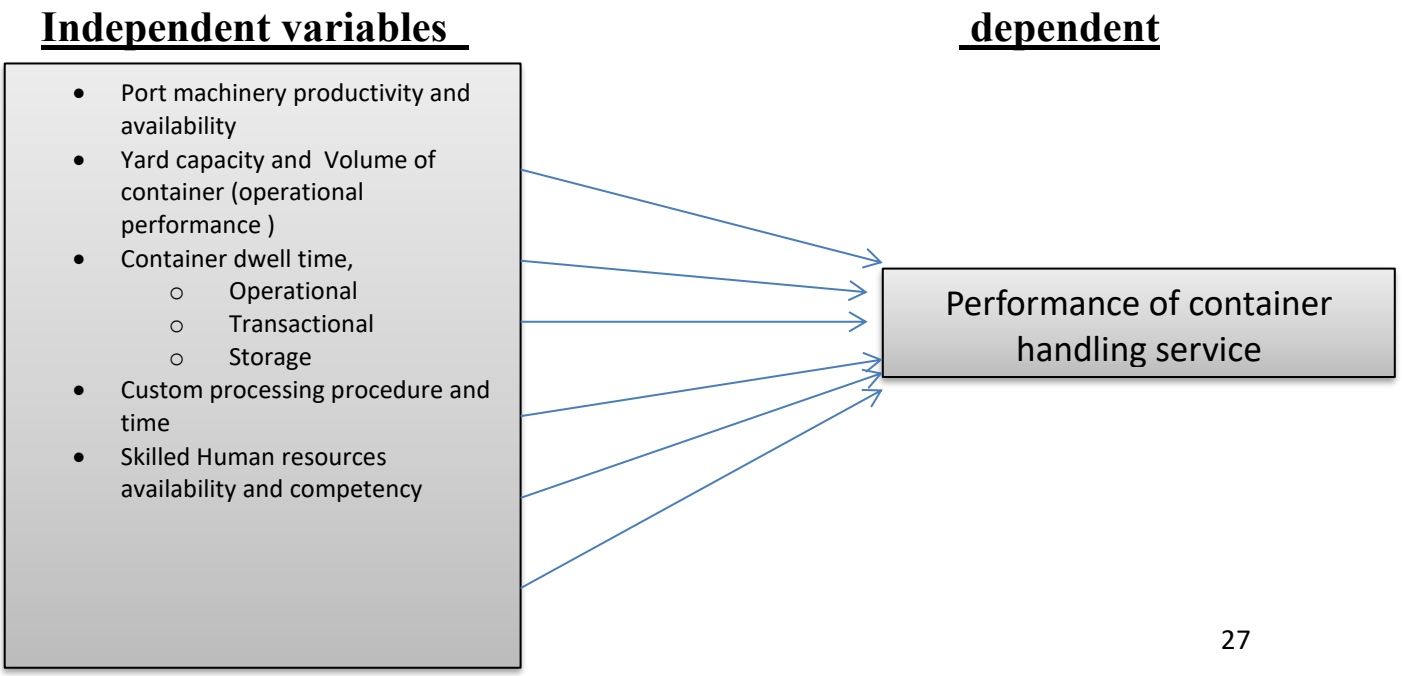
2.6 Conceptual Framework

Cultivating performance of container handling service in dry port is the sign of competitive logistics performance existence that is at the one of core of the economic growth and competitiveness agenda (Arviset al. 2014). Policymakers globally recognize the logistics sector as one of their key pillars for development. Indeed, inefficient container handling service as part

of logistics service raises the costs of trading and reduces the potential for global integration. In international trade besides other factors the logistics performance of ports are very important for the competitiveness of countries. Hence, identifying those factors which influence the performance of ports on container handling service have vital role . For the purpose of this study, the conceptual framework is developed based on the research works of Ng (2006) and Vaggelas and Pallis (2015).

Therefore, the research will be guided by the conceptual framework that is indicated in below diagram. The variables in the left sides that are; yard capacity that is resulted by yard occupancy rate and accommodation of the container volume on demand , container handling equipment that is expressed through port machinery productivity , port infrastructure shown in the form of communication system better track and rail facility and good working structure , customs operations and processing time , competency of man power stuff and reliability of port operation, Dwelling time that is the manifestation of the above and other factors , are determinants of port performance on the container handling service which are identified from the literature. The determinant variables are believed to affect the performance of container handling service either directly or indirectly and the arrow showed that the activities and interaction of those variables affect port performance of container handling service .

Conceptual framework of the study that is on factors affecting performance of container handling service depends on the dependent and independent variables of the service process



2.7 Summary

This paper has overviewed factors affecting performance of container handling service. The review of the study has been concentrated on theories and empirical studies that have made an effort towards establishing factors affecting performance of container handling service within the logistic world. Some of these factors discussed were: turnaround time of track and cargo dwell time, size of dry port and yard capacity, port infrastructure, port machinery productivity and availability ,custom clearance processing time and procedures , and other like infrastructure of the port yard together with working system .

CHAPTER THREE:

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the research paradigm, approach, methods and design being used by the study, while underlining the population and issues related to sampling technique, sample size determination, and data collection instrument. Besides, the chapter outlines the approach to data collection and analysis.

3.2 Research Paradigm, Approach and design

3.2.1 Research Paradigm

The study of the research will be conducted on Mojo dry port on the assessment of performance of terminal container handling service from the perspective of service time efficiency and factors affecting the performance of the service time.

3.2.2 Research Approach

The research apply mixed research approach of qualitative and quantitative perform data analysis in the study . Qualitative approach is used to identify the behavioral characteristics' of the study area and to increase our understanding of why things are the way they are and people act the way they do on the other hand quantitative approach used to identify numeric measurements on current performance of the port efficiency and quantitative techniques to the examination of casual relationship using a deductive process.

3.2.3 Research design

The nature of this study is **descriptive and explanatory** design which involve precise procedure & data source specification, to discover the degree of association/correlation among variables and the aim to test the answer research questions. Quantitative and Qualitative research method used to draw inferences about relationship of variables from survey data. A deductive approach is applied to draw the research problems, research questions, on the research topic

3.3 Population and Sampling

Target Population Sekaran (2010) refers to population as the entire group of people or things of interest that the researcher aims to assess. Population as defined by Mugenda and Mugenda

(2003) is an entire group of individual or objects having common observable characteristic. The study therefore took

First; Container volume at mojo port of both imports, transshipment and exports, in twenty-foot equivalent units (ETU) handled by a container terminal of the current year is selected as one of the primary and main target of population to identify the container handling dwelling time performance of study time .

Due to data availability factor from the entire container volume population representative samples of containers was selected based cross-sectional survey method on a specific date that the researcher collected on the port based on data availability and accuracy .

Secondly ; The study also took all person involved in the operations of container terminal container handling service in Modjo dry ports has taken as stakeholders who have direct involvement on container handling service operation and who have expeties knowledge on the study area . As target a target population included 60 Employee of Modjo port those are included as operators , 55 Employee of Modjo custom & regulatory office that are working on operation , and 240 customer of Modjo dry port that expected they have expertise knowledge like(traitors , forwarders). The number of these people when put together is approximately 355. Therefore the study will target 355 people.

Table 3.1 summer of target population for primary data sources

TOTAL STRATUM	**TARGET TOTAL OPULATION**	**PERCENTAGE**
Employee who are operators of Modjo port	60	21%
Employee of custom & regulatory office	55	19%
Customer of Modjo dry port container handling service	240	60%
TOTAL	355	100%

3.3. 1 Sample Design

To achieve the objectives of the study, both primary and secondary data collected. Primary data collected from the respondents' using sampling frame based on purposive sampling technique. The target populations of the study that are employees and clients of Modjo Dry port including customs employees of mojo dry port branch that have direct involvement on container handling service operation . The main reason for using purposive sampling is simply to get relevant data from those who are presumed to have the expertise knowledge on the issues addressed in this study. Not all persons in the population may have equal insight about the challenges and prospects of dry port container handling service performance. Due to this background reason from

- The total population of 518 mojo port employees the researcher used 60 employees those who are working on port operation as target population ,
- The total population of 484 customs employees 55 employees are selected as target population from port operation department
- Finally from 1500 mojo port customers 240 customers are targeted as target population target population with consideration of those who have expertise knowledge on the issues(like traitors and forwarders) . and from the selected sample from the required sample size is determined and questioner is distributed randomly

Secondly on selection of representative sample from target population of Container volume at mojo port in twenty-foot equivalent units (ETU) handled by a container terminal of the current year, Due to data availability factor the researcher used cross sectional survey sampling method and collect container row data on January 25 2020 that full information is available to calculate dwelling time

3.3.2 Sampling Size

Sampling and Sample size Keller (2009) indicates that a sample is a set drawn from the entire population. A stratified sampling technique was employed to stratify three (3) units at the Modjo dry Port Employee of Modjo port with 518; Employee of Modjo custom & regulatory office with 484 and Customer of Modjo dry port with 1500.

Although Kothari (2004) expresses a sample size between 10% and 20% is considered adequate for in-depth studies, the researcher adapted Sloven's sampling method used.

Based on this in order to determine the required sample size at 95% confidence and with level of precision of 10%. this formula is used **$n= N/1+N(e)^2$** , **n=Sample size N=Target population(purposive sample frame)**

Therefore, the sample size for this study is 250, with sample margin of error 05 %. That is 90 % of confidence interval, However during data collection 24 of the respondents was not respond on the given schedule.

Table 3.2 Sampling Frame

Total population	**Purposive target population**	**Actual Sample size with (95% Confidence Interval)**	**Missed/not responded/**
From 518 = Employee of Modjo Dry port/	60	52	5
From 484= Employee of Modjo custom & regulatory office	55	48	4
From 1500= Customer of Modjo dry port who are traitors and forwarders	240	150	15
2502 = TOTAL	355	250	24

Based on cross-sectional survey sampling method secondary data on container volume the entire container existed on January 25 2020 that is 30189 container data was collected the main reason of selecting the method is the sample shall determine the population size using reliable secondary data availability .

3.4 Data collection

Data gathering tools and Sources

I would argue that using more than one data collection instrument would help obtaining richer data and validating the research findings. Though to achieve the objectives of this research, the researcher has collects both primary and secondary data. For the sake of collecting primary data's the researcher has uses questionnaires and little interview. The interview has been conducted on the interviewee's work place. Interview conducted until information has reached saturation and no additional information could be generated from the interview.

Raw data from the data base of Modjo dry port on container transactions more on container volume, port machinery performance, and yard capacity used as secondary data source. Data from Newspapers, Published books, Journals, Magazines, articles, internet, report provided by the government, research conducted by research agencies.

Data Collection Procedure

In this study, both primary and secondary data were used. For primary data collection purpose, survey questionnaire was used. 250 respondent from mojo dry port customer and employees of custom and mojo port , customers of mojo port was approached personally and asked to fill the questionnaire . The questionnaire has three sections. First section is about general information of the participant and the company. In the second section participants were asked to factor affecting performance of container handling service and associated effects . In the final section respondents were requested to indicate the significance level of this factors and there impact on the container handling service performance .

For secondary data based on correctional survey method and consideration of data availability and validly to reduce biasedness the researcher collected all container data that existed on Jan 25 2020 from the terminal operational data base

3.5, Data analysis and presentation

The study used **descriptive** design and the analysis was done with the help of Statistical Package for Social Sciences (SPSS) and Microsoft Excel version 2013 l. To analyze the data this study used descriptive statistics. According to Marczyket.al. (2005) descriptive statistical procedures allow researchers to describe groups of individuals and events, examine the relationships between different variables, measure differences between groups and conditions, and examine and generalize results obtained from a sample back to the population from which the sample was drawn. Furthermore, descriptive statistics of frequency tables are used to describe the data collected in research studies and to accurately characterize the variables under observation within a specific sample. The responses in the questionnaire were coded into common themes to facilitate analysis. Data was presented in descriptive form supported by tables, frequency distributions, graphs and percentages.

The issue that arose from the analysis will be grouped by factored variables on the conceptual frame work : investigate the current dry port container handling operational performance output,

dwelling time, look at the factors affecting this performance more on dwell time, port equipment performance, human factor, custom process procedure and time. And Presentation will be done on tabular, chart and statistical data. In addition to this the researcher provide clear explanation based on the result get from the analysis.

3.6 Scale Validity And Reliability

On the data collection of primary data based on questioner in this research . the research used A – D and A-E -point Likert scale questionnaire to mange the respondent response .Indeed, issues of validity and reliability of research instruments are great significance to the findings of any scientific research. Moreover, as Dörnyei (2007) adds, validity and reliability issues serve as guarantees of the results of the participants' performances. Two types of validity are discussed in social science literature: internal and external (Berg, 2007). Internal validity refers to the extent to which an investigation is actually measuring what it is supposed to measure. while external validity answers the question: Can the findings be generalized ? Yet, in order to maintain this, the research will consider a number of factors.

On the other hand, reliability refers to the extent to which a research instrument yields the same results on repeated trials. In sum, this research will follow techniques that would help maintaining the validity and reliability of research.

Performance variable	**Reliability Statistics**	
	Cronbach's Alpha	N of Items
Operational performance or yard capacity Variable	0.878	3
Dwelling time variable	0.875	7
Port equipment availability and productivity Variable	0.833	3
Competency of terminal Operators Variable	0.866	1
Custom processing time and impact Variable	0.799	1
Average	0.857	

Cornbach's alpha is a measure of internal consistency, that is, how closely related a set of items are as a group. It is considered to be a measure of scale reliability. A "high" value for alpha does not imply that the measure is one-dimensional. If, in addition to measuring internal consistency, you wish to provide evidence that the scale in question is one-dimensional,

additional analyses can be performed. Exploratory factor analysis is one method of checking dimensionality. Technically speaking, Cronbach's alpha is not a statistical test – it is a coefficient of reliability (or consistency). Finally as reliability statistics score (0.857), it is categorized under Cronbach's alpha measure of internal consistency is good or better which indicates the questions are reliable and acceptable.

3.7. Ethical Consideration

Ethical Issues According to Leedy et al (2005), there are a number of key ethical issues that protect the rights of research participants. These are protection from harm, informed consent, the right to privacy and honesty with professional colleagues. The principle of informed consent requires that respondents not be forced to participate in research. In this study, the participants were well informed about the nature of the study and participation was on voluntary basis.

CHAPTER FOUR

ANALYSYSE RESULTS AND DISCUSSION

4.1 Introduction:

This chapter is a presentation and discussion the empirical findings and results of the research. The data presented includes response rate, background information of the respondents and the presentation of research findings against each individual specific objective. Descriptive statistics was also employed in analyzing the findings.

4.2 Response rate and demographic data

Response Rate

From the data collected, out of 250 questionnaires administered, 226 were filled and returned which represents 90% response rate. Such a response rate is considered adequate according to Mugenda and Mugenda (2003) who mentioned that a 50% response rate is adequate, 60% good and above, while 70% is rated very good. This also collaborates with Bailey (2000) assertion that a response rate of 50% is adequate, while a response rate greater than 70% is very good. This infers that the response rate in this case of 50% was an adequate representation of the entire targeted population for questioner survey .

Demographic data

The demographic characteristics on respondents in this section include age, gender, highest education levels obtained, marital status; number of year's worked in the organization and Employment group (Dry port, Custom/regulatory office and Customer). From 250 sampled data 226 respondents were conducted which gives a response rate of 90.5

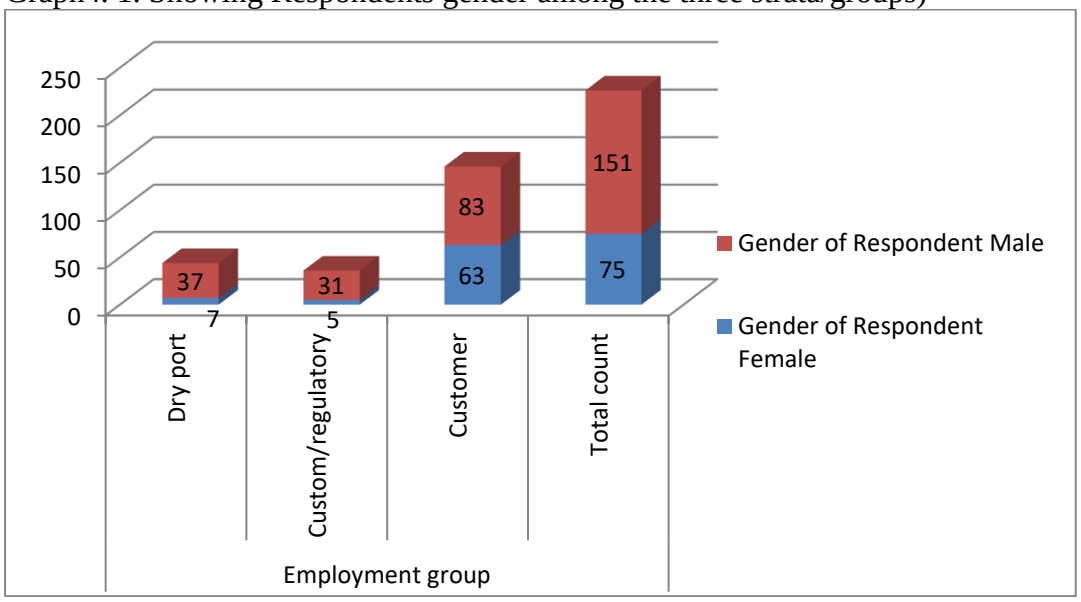
Table 4.1 Age of Respondent

Age of respondent		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Between 18-25 years	64	28.3	28.3	28.3
	Between 26-35 years	117	51.8	51.8	80.1
	Between 36-45 years	35	15.5	15.5	95.6
	Above 46 years	10	4.4	4.4	100.0
	Total	226	100.0	100.0	

As the above Table, indicated that the biggest numbers of respondents were in the age range of

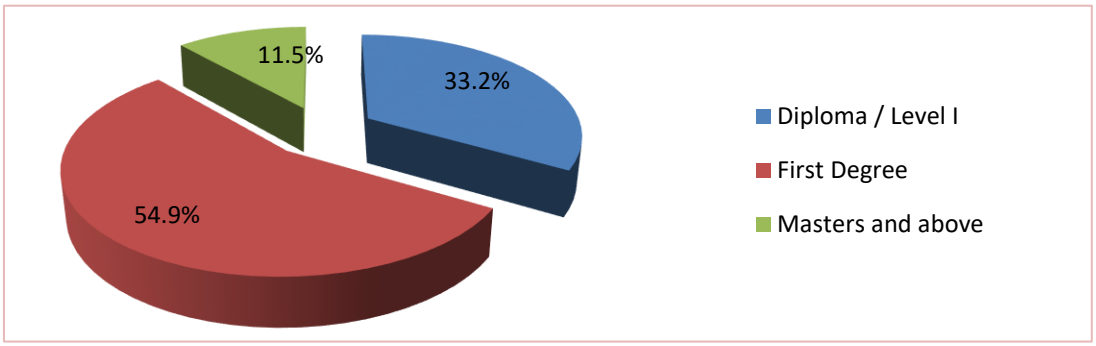
26-35 years share 51.8% of the total respondents. 28.3% were in the age range of 18-25 years, 15.5% were in the age range of 36-45 years and 4.4% of them are above 46 years. This implies that our respondents are highly productive age due to 51.8% is categorized in 26-35.

Graph4. 1. Showing Respondents gender among the three strata/groups)



From graph 1 above, it's indicated that 66.8% of the respondents were male, while 33.2% were Female. This implies that male respondents dominate female.

Graph 4.2. Education level of Respondents



From the above pie chart, it's indicated that 54.9% of the total respondents are first degree holder, 33.2% were diploma holders and the rest11.5 % were Masters and above.

The majority had degree that implies the respondents were higher education than with lower education.

Table 4. 2. Showing Number of years worked/experience/

Employment group	**below 2 years**	**between 2 to 4 year**	**between 4 to 6 years**	**Above 6 years**	**Total**
Dry port	5	18	11	10	44
Custom/regulatory	2	16	6	12	36
Customer	20	63	35	28	146
Sum	**27**	**97**	**52**	**50**	**226**
Percentage (100%)	**12%**	**43%**	**23%**	**22%**	**100**

From Table 2. Above it's indicated that Majority of the respondents were categorized between 2-4 years of experience which comprise 43% of the total respondents. 23% of the respondents were 4-6 years of experience. Furthermore 22% of the total was above 6 years' experience and less than 2years were 12%.This implies that the respondents were youngster and experienced.

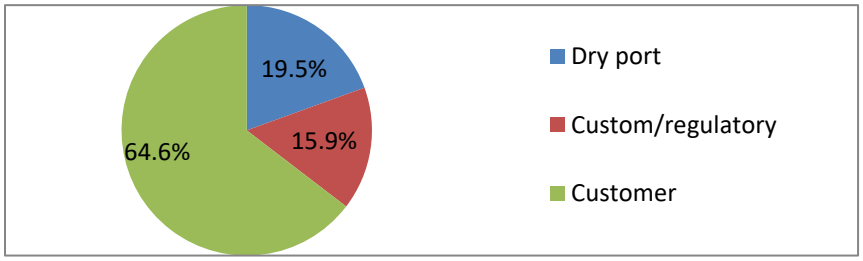
Table 4. 3. Showing Respondent marital status

Marital Status

Categories		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Single	108	47.8	47.8	47.8
	Married	111	49.1	49.1	96.9
	Divorce	5	2.2	2.2	99.1
	Widow	2	.9	.9	100.0
	Total	226	100.0	100.0	

From Table 4.3 above its indicated 49.2% were married, while 47.8% were single,2.28% were divorced and 0.9% were widowed. This implies that married and single respondents were nearly proportionated by marital status.

Graph4. 3 .The three Employment Group



As it was explained on proposal plan the target population included in the study was Employee of Modjo port, Employee of Modjo custom & regulatory office, and customer of Modjo dry port. As shown on the above chart since the number of Employee is higher than Modjo port and terminal customer and Modjo Customs workers which encompasses 64.6%, the second one were Modjo port customers by 19.5% and 15.9% were Employee of Mojo custom & regulatory office.

4.3 ANALYSIS RESULT

The analysis results describes the respondent response to the survey questioners and secondary data statistical results on operational performance of the port with yard capacity ,dwelling time , port handling machinery availability and productivity , human competency ,custom processing time , communication system ,factors that affects performance of container handling service presented as follows

4.3.1 Assessment on yard capacity and container volume operational performance factors

The assessments on the capacity of the container yard to the demand volume of container were made on three indicators: Container Terminal yard capacity as performance indictor and determinate factor , on Throughput of Container Cargo at the Port of Mojo and Current aver all Performance of Container Terminal at the Port of Mojo . The results on these indicators were presented on Table 4. 3.1.

Operational performance or yard capacity Variable		Respondent	Respondent		mean of mean
sub variable	scale	**frequency**	**present**	**mean**	
Container Terminal yard capacity as performance indictor and determinate factor	Strongly agree	23	10%	4.14	3.8
	Agree	34	15%		
	uncertain or No opinion	79	35%		
	Disagree	52	23%		
	Strongly disagree	38	17%		
		226	**100%**		
Throughput of Container Cargo at the Port of Mojo	Very Fast	15	7%	3.8	
	Fast	120	53%		
	Average	90	40%		
	Slow	0	0%		
	Very Slow	0	0%		
		226	**100%**		
Current Performance of Container Terminal at the Port of Mojo	EXCELLENT	11	5%	3.6	
	GOOD	81	36%		
	AVERAGE	113	50%		
	POOR	14	6%		
	VERY POOR	7	3%		
		226	**100%**		

Table 4. 3.1. Source: Own compilation, 2020

Respondent perceived that the port yard capacity at Modjo dry port is an important determinant of port performance. Table above indicated that the mean value of the respondents on Container Terminal yard capacity as performance indictor and determinate factor was 4.14 which indicate respondent believed that yard capacity of the port is important in determining the performance of container handling service . Similarly the response on Throughput of Container Cargo at the Port of Mojo showed that more than 93 % of the respondent believed that current aver all performance of container terminal is average and fast and more that 86% of the respondent perceived that the current aver all performance of the port yard is average and more in terms of accommodating the demand container volume

Which leads to conclude that the yard capacity utilization rate is at average level and yard capacity is one determinate factor that influencing performance of container handling practice.

The research works of Nyma (2014) and Ruto and Datche (2015) also indicated that size and yard capacity of ports are important factor in determining container handling service performance.

4.3.2 Assessment on port machinery productivity and availability factors

The assessments on port handling equipment were made on three indicators namely Performance of Reach stacker in terms of loading and unloading from Rail/trucks at the port of Mojo? yard port equipment operational performance efficiency?. Respondents were asked to Port equipment availability and productivity as one factor to affect performance of container terminal service . The result is presented in Table 4.3.2 .

Port equipment availability and productivity Variable		Respondent	Respondent		mean of mean
sub variable	scale	frequency	present	mean	
Performance of Reach stacker in terms of loading and unloading from Rail/trucks at the port of Mojo?	VERY GOOD	18	8%	3.0	3.05
	GOOD	68	30%		
	AVERAG	140	62%		
	POOR	0	0%		
	VERY POOR	0	0%		
		226	100%		
yard port equipment operational performance efficiency?	Very effective	0	0%	3.1	
	Effective	23	10%		
	Average	140	62%		
	Ineffective	45	20%		
	Very ineffective	18	8%		
		226	100%		
Port equipment availability and productivity as one factor to affect performance of container terminal service	Strongly agree	113	50%	4.1	4.3
	Agree	90	45%		
	No opinion or uncertain	23	5%		
	Disagree	0	0%		
	Strongly disagree	0	0%		
		226	100%		

From Table 4.3,2 Source: Own compilation, 2020

On assessment of respondent Port equipment availability and productivity as one factor to determine performance of container terminal service , the result indicates that The mean value of the respondents was 4.11 which indicated that availability of cargo handling equipment is a significant factor in determining the performance of Mojo dry port.

Similarly, on the assessment of ranking the performance of Reach stacker in terms of loading and unloading from Rail/trucks at the port of Mojo?, findings concludes that the performance of the Reach stacker in terms of loading and unloading of train/trucks at the port of Mojo is on

average statues. And On measuring yard port equipment operational performance efficiency? Finding indicates that from the 226 respondents, 57% say satisfactory, 36% of the respondents measure it good.

Generally survey question on the assessment of port equipment productivity is on average statues by scoring 3.1 mean value and by it is one determining factor for performance of container handling service .. Likewise, the research works of Gujar (2011), Nyma (2014) and Tongzon (1995) also indicated that cargo handling equipment are important determinant of port performance. In addition, the number of cargo handling equipment are an important determinant as it directly affects the speed with which container loaded trucks may be served (more cranes may increase the number of containers handled per hour or day), and in effect, the turn-around time as well. Besides the number of container handling equipment, a well-organized procedure to ensure adequate spare parts are kept in stock is important, as surveys of ports, particularly in developing countries, have shown that delays have too frequently been caused by the lack of spare parts.

4.3.3 Assessment on dwelling time factor and its effect on performance of container handling service

On the assessment of dwelling time as deterministic factor and performance indicator the survey question assessed respondent samples response on The extent of agreement or disagreement as to whether dwell time is one factor that affect container terminal performance at the Port of Mojo?, average dwelling time performance of the port container handling service that is summarized in table 4.3.3

Dwelling time variable		Respondent	Respondent		mean of mean
sub variable	scale	frequency	present	mean	
Operational Dwell Time	Very Fast	23	10%	3.2	3.1
	Fast	34	15%		
	Average	79	35%		
	Slow	52	23%		
	Very Slow	38	17%		
		226	100%		
Storage Dwell Time	Very Fast	0	0%	3.0	
	Fast	23	10%		
	Average	79	35%		
	Slow	108	48%		

	Very Slow	16	7%		
		226	100%		
Transactional Dwell Time	Very Fast	0	0%	3.3	
	Fast	25	11%		
	Average	151	67%		
	Slow	50	22%		
	Very Slow	0	0%		
		226	100%		
Dwell time as one factor to affect performance of container terminal service	Strongly agree	113	50%	4.11	3.95
	Agree	90	40%		
	No opinion or uncertain	23	10%		
	Disagree	0	0%		
	Strongly disagree	0	0%		
		226	100%		

Table 4.3.3 Source: Own compilation, 2020

The result indicates that the average dwelling time of container have average position with a mean value of 3.1 that indicates average performance dwelling of lower value .

Similarly when we measure the sample response on dwelling time as deterministic factor to container handling service it resulted that more that 90% of the response agreed with mean value of 3.95 that indicates majority of respondent believes that dwelling time is a deterministic factor on container handling service performance .

In addition to the average dwelling time level determination assessment on the effect of long dwelling time on port being the Couse of port congestion the study assessed three questioner survey How do you assess the congestion of container operations at the port of Mojo?, How would you describe the nature of congestion at the port currently?, and Suggestion on the Couse of congestion is Infrastructure , Terminal container free time , Storage charge cost , Operation inefficiency, or other at the port of Mojo? That shown on table 4.3.4

Dwelling time effect on congestion		Respondent	Respondent		mean of mean
sub variable	scale	frequency	present	mean	
Congestion of Container Operations at mojo terminal	VERY GOOD	5	2.00%	3.5	3.55
	GOOD	23	10.00%		
	AVEARAGE	95	42.00%		
	BAD	97	43.00%		

	VERY BAD	7	3.30%		
Total Sum		226	**100%**		
Nature of congestion at the Port of Modjo	HARDLY EVER	0	0.00%	3.6	
	OCCASIONALLY	81	36.00%		
	SOMETIMES	136	60.00%		
	FREQUENTLY	9	4.00%		
	ALMOST ALWAYS	0	0.00%		
Total Sum		226	**100%**		

Table 4.3.4 Source: Own compilation, 2020

The result show that A 5-point Scale was used to assess the congestion of container operations at the port of Mojo. Finding reveals that of the 226 respondents, 42% of the respondents assess it on average, 43% of the respondent mention it to be bad, 10% of the respondents assess it as being good, 3% of the respondents assess the congestion problem of container operations to be very bad, 2% of the respondents assess it to be very good,. This infers that the congestion problem of container operations at the port of Mojo is on the bad side and average statues. And The study to assess the current nature of congestion occurrence at the port. The finding showed that 36.7% of the respondents describe the current nature of congestion occurring occasionally, 60% of the respondents describe it occurring sometimes, 3.3% of the respondent describe it occurring frequently, while hardly ever and almost always were unanswered. Therefore, this suggests that the current nature of congestion at the Port of Mojo occurs sometimes. We can co - relate that effect of long storage dwelling time reflected through the occurrence of congestion with sometime frequency occurrence that increase storage cost , reduce port yard space utilization and port machinery productivity.

Likely literatures indicate that dwelling time is the major factor for existence of congestion and inefficient space utilization that reduce machinery productivity .Dwell time is an indicator of how efficient the ports are operating and how quickly the containers are flowing through the terminals (Jul 26, 2019 - Michelle Grubbs)

4.3.4 Assessment on Human competency factor

On the assessment of competency of terminal operators significance and impact on container handling service performance at Mojo dry port ?. Finding reveals that out of 226 respondents, 50% of the respondents asses Very Significant ,10% of the respondents assess Significant 30% of the respondents assess Slightly Significant , 10% of the respondents assess Not Significant , and Moderately Significant were unanswered..

Competency of terminal Operators Variable		Respondent	Respondent		mean of mean
sub variable	scale	Frequency	present	mean	
Competency of terminal Operators	Very Significant	113	50%	3.89	3.89
	Significant	23	10%		
	Moderately Significant	0	0%		
	Slightly Significant	68	30%		
	Not Significant	23	10%		
		226	100%		

Table 4.3.5 Source: Own compilation, 2020

The result on that the mean value of respondent con competency of terminal operators was 3.89 that means majority of respondent customers considered them as an essential factor to determine performance of container handling service . The study report of Gujar (2011) and Rajasekar and Deo (2014) also indicated that number of employee and their quality important factors which influence the performance of dry ports.

4.3.5 Assessment on Customs operations processing time and procedure factor

The study sought to assess the effect of Custom Clearance time on port performance at the Port of Mojo .Finding reveals that out of 226 respondents, 62% of the respondents assess to be Moderate,20% of the respondents assess customs clearance process time to have low effect , 10% of the respondents assess to high effect , 8% of the respondents assess to be very low effect , 0% of the respondents assess to be very high effect , This infers that custom clearance time have average effect on container terminal performance with the mean value of 3.99. that leads to conclude that custom processing time one of the deterministic factor on performance of container handling service time

Custom processing time and its impact (Variable)		Respondent	Respondent		mean of mean
sub variable	scale	Frequency	Present	mean	
Custom processing time and impact	**Very high**	0	0.00%	3.99	3.99
	High	23	10.00%		
	Moderate	140	62.00%		
	Low	45	20.00%		
	Very low	18	8.00%		
		226	100%		

Table 4.3.6 Source: Own compilation, 2020

According to the study of port performance determinants by Nyma (2014) and Ruto and Datche (2015) customs operations at port are an essential determinants of port performance. One of the focal issues in international trading is the performance of customs and their efficiency in clearing goods. In the modern business environment of just-in-time production and delivery, it has become ever more important that traders are guaranteed fast and predictable release of goods. Therefore, streamlining and simplifying clearance procedures are beneficial to importers, exporters, and national economies

4.3.6 Comparison on Determinants of Port Performance

Table 4.7 presents the comparison between factors which determine the performance of Modjo dry port. In the above sections each determinants were treated separately and in this section mean of mean value of the variables were compiled in order to determine the comparative level of importance of each factors.

Table 4.7 - Average score for the determinants of port performance

Performance variable	Average Score of mean
Operational performance or yard capacity Variable	4.14
Dwelling time variable	3.95
Port equipment availability and productivity Variable	4.2
Competency of terminal Operators Variable	3.8
Custom processing time and impact Variable	3.99

The result in table 4.7 can be used as a point of comparison on different factors which determines performance of Modjo dry port. According to table 4.7 , Port equipment availability and productivity Variable and Operational performance or yard capacity Variable get the highest scores Custom processing time and impact Variable, Dwelling time variable and Competency of terminal Operators Variable. Have impact based on sequential scores . therefore the result indicates All factors are important determinants of container handling service practice and efficient performance of Modjo dry port container handling service practice .

4.3.2 Analysis Results on secondary data

The study also assesse secondary data sources and analyzed the data to get performance level of container volume yard capacity accommodation , dwelling time , productively of Reaches stalker , and compare ti with international service standard

4.3.2.1 Operational Performance by container volume factor

There are many factors that affect performance of a container terminal. One indicator of the terminal's performance is the terminal container handling capacity and development in line with the container volume demand to be stored in the terminal when we see mojo terminal capacity development for the last 5 years the is presented below

No.	Activities	measure ment	Last five years				
			2008	2009	2010	2011	2012 six month
			Performance	performance	performance	performanc e	performance
1	Full in	TEU	124,949	133,070	130,747	128,791	70,975
2	Full Out	TEU	120,704	134,408	132,267	125,862	68,156
3	Empty in	TEU	119,759	133,643	128,696	127,391	73,056
4	Empty Out	TEU	118,761	133,234	128,882	125,661	69,983
Throughput		**TEU**	**484,173**	**534,355**	**520,592**	**507,705**	**282,170**
throughput deference			base line	50,182	-13,763	-12,887	28,317.50
Average increment in %			base line	10%	-3%	-2%	11%
Average increment Mean in %			4%				

Table 4.3.7 **The last six month container handling volume for modjo**

No.	Activities	Indicators	2012 performance of ESLSE and MOJO port		percentage share
			ESLSE six month	mojo port six month	
			performance	performance	%
1	Full in	TEU	70,975	91,264	78%
2	Full Out	TEU	68,156	94,438	72%
3	Empty in	TEU	73,056	95,913	76%
4	Empty Out	TEU	69,983	91,844	76%
Throughput		**TEU**	**282,170**	**373,459**	**76%**

Table 4.3.8 The last six month container handling volume for modjo

From the table 4. 3.8 it is clear that the total volume performance of mojo dry ports is 282170 and total ESLSE 373,459 in the year 2012EFY last six month performance report . According it indicates that , 76% containers were operated at Modjo port and As it is indicated in table 7 8 . from 2008 EBY to 2012 EBY operational performance of Port and terminal sector increased by average mean of 4%. This means that as the volume of container served increased. That can be taken as a good performance

4.3.2.2 Productivity of Reaches stacker as one port equipment performance factor that affects performance of container handling service

Port Equipment productivity: The value that is of interest is the number of container moves made per working hour, either for an individual machine or for the stock of a particular type of machine. And port Equipment utilization: one of the affecting factors in container handling service since the terminal's investment in cargo-handling equipment is very costly, equipment utilization is an extremely important performance measure. The utilization of any item or type of equipment is defined as the proportion of time that it was effectively deployed over a specified period.

When we see the Reach stacker productivity of mojo terminal port that is one of the dominant applicable port equipment Under table 4.12 below described that the actual productivity of the Reach stacker is 20.9 in 2019/20 .From the data it could be observed that as quantity of container served increased, fuel consumption and time spent on work by the machinery increased. But From the given data on average, the productivity is 21 TEU containers per hours.

Table 4.12.:- Average Productivity of Reach stacker

Annual Reach stacker Productivity in 2008 EFY			
Fiscal Years	Average Working Hours	Average daily Container quantity in TEU	Productivity per Hr
2012 EFY	18	376	20.9

(Source: Mojo Port and Terminal six month Report of 2012EFY)

However, when this performance compared to international standard it is very low. Because the standard (ISO and Smith, Dan, 2012) estimated productivity of the reach stacker is up to 35 containers per hour (at maximum level); but in practical the score is found in the range 28 to 30 containers per hour on average.

4.3.2.3 Assessment on dwelling time factor

Dwelling time is one of the factor that affect performance of a container terminal. That is the average time a container remains stacked on the terminal from the moment it is offloaded from the track or rail to the time it gets out of the gate in the import cycle, and the converse in the export cycle. Merckx (2005) did extensive research on the impact of dwell time on terminal throughput.

Container dwell time As of Jan 25 2020				
S. No.	**Dwell time**	**contain in box**	**A.V. Dwell**	**Dwell time share**
1	0-5	1896	4	6.24%
2	5-10	4387	9	14.44%
3	10-20	7875	19	25.91%
4	20-40	7774	38	25.58%
5	40-60	3519	55	11.58%
6	>=60	4738	108	16.25%
Total Sum		**30,189**	**G.A.V.D. time 39 in day**	**100%**

Table 4.10 average dwelling time for the last six month

Even if as it is mentioned in table 8and 9 operational performance of sector increased annually; in terms of container volume however, the performance of container dwelling time is not interesting. From the annual report (2015/16), the dwelling time is 56 days on average. The international trend of dwell time is in grace period of 8 days which is free from warehouse cost. As the table 4.10 above shows the current grand average dwell time of modjo port and terminal is 39 days which initiate the researcher to study on factors affecting port performance on container handling service specifically with service time factor. This means that as the volume of container dwell time increased; container congestion in the terminal increased, become inconvenient for effective space utilization and management of the terminal, create work burden on port machineries and equipment, increased operational cost by limiting or consuming more space and hence decelerate the service provision. Generally the efficiency of the sector is decreased, as the dwelling time of container increased at terminal.

Service standard of mojo terminal

S.No.	Type of service	Measurement	Standard
1	**Full in receiving**	**Minute**	**18**

2	**Full con. Delivery**	**Hour**	**24**
3	**Empty con. Receiving**	**Minute**	**14**
4	**Empty con. Departed**	**Minute**	**13**
5	**Roro receiving**	**Minute**	**10**
6	**Roro Delivery**	**Minute**	**34**
7	**Export services**	**Minute**	**83**
8	**Stuffing & seal export con.**	**Minute**	**33**
9	**Receiving SSR & giving work order**	**minute**	**6**
10	**unstuff/ stuff at cfs**	**Hour**	**18**
11	**unstuff to warehouse**	**Hour**	**18**
12	**unstuff to truck**	**Hour**	**18**
13	**preparing D/O**	**minute**	**4**
14	**preparing GRR**	**minute**	**7**
15	**Billing**	**minute**	**10**
16	**GRO**	**minute**	**6**
17	**Loading**	**minute**	**10**

Table 4.10 average service time standard of mojo branch

The table shows secondary data taken from the last year trend that explain the operational standard of modjo port and terminal activities. This is one of the expected factors of dwell time by researcher.

Terminal Storage Tariff

S.No.	Dwell time	Measurement	20 ft container			40 ft container	
			Standard	Dangerous	oversize	standard	dangerous
1	1-8 days	ETB					
2	9-18 days	ETB	99	124	109	198	240
3	19-28 days	ETB	132	165	145	264	330
4	29-35 days	ETB	175	219	193	350	433
5	36-45 days	ETB	232	290	255	464	580
6	46-60 days	ETB	312	390	343	624	780
7	Above 60 days	ETB	418	523	460	836	1045

Table 4.11 average service cost of tariff for mojo branch

The table stated above shows Mojo port and terminal warehouse charge in the interval days. The first eight days or allowed grace period is free from warehouse cost. Although the tariff is progressive it is expected by the researcher that is very minimal cost followed abandoned container in Mojo port and terminal. This is relatively low cost comparing with private warehouse that the importer delays to clear port and customs

4.4 Interpretation and Discussion

In order to see the general perception of the analysis result regarding the selected factor affecting performance of container handling service in the subject organization, Doweling time factor that is **(**Operational Dwell Time, Transactional Dwell Time , storage dwell time) , port equipment effectiveness(machinery productivity) factor , yard capacity factor . Manpower competency level and custom processing time factor, based on the basic research questions will be stated below

Descriptive interpretaion and descution on yard capactity of container volume container volume factor

When we measure the performance of port container handling service performance measuring the container handling capacity is the First, it needs to know how effectively it is operating and How much cargo it handles every day? . When we see Mojo container terminal of operational performance on container volume for the last 5 years As it is indicated in secondary data analysis table 4.8 from 2008 EBY to 2012 EBY operational performance of Port increased by an average increment mean of (4%). This means that as the volume of container served increased, the number of machineries and equipment used increased so as to manage the volume of incoming, and outgoing full and empty containers.

From primary data analyses by questioner survey. On Determining to find out the extent of agreement or disagreement as to whether container terminal efficiency can be measured by the level of increase in inputs and throughput at the Mojo dry port . show that more that 60 % of the respondents agree that increasing the level of inputs and throughput in container terminal determines its performance efficiency. And the assessment on the current throughput of container cargo at the Port of Mojo. reveals that 40% of the respondents assess the throughput to be moderate, 53.3% assess it to be high, that implies that the throughput of container cargo at the Port of Mojo currently is encouraging, due to its high throughput.

Therefore when we measure the performance of mojo dry port by container volume and throughput it indicates that as the volume of container served increased, the number of machineries and equipment used required to be increased so as to manage the volume of incoming, and outgoing full and empty containers.

Descriptive interpretaion and descution on Selected Factor of dweling time to answer the reserch question What role does dwell time play on container terminal efficiency?

Dwell time is one of the dominant container terminal performance indictor .The average or mean dwell time has usually been the main target indicator from service time efficiency. The statistic is easy to compute and easy to understand. However ,average/mean dwell time is combination of three Dwell time named operational, transactional and storage dwell times. Storage dwell time seems to have greater contribution than others, which is caused by presence of huge free storage period at mojo . Operational dwell time is the time to unload track /or rail and store containers in yards. It mainly depends on the efficiency of the port and the availability of equipment combined with the level of occupancy of storage facilities. Transactional dwell time mainly concerns the transaction time between the importers/port services and customs procedures.

When we see the study analysis result of Mojo dry port performance on average dwelling time From secondary data analyses and compare it with international standard that is 8 days of free time mojo dry port container terminal is taking an average dwelling time of 60 day in (2018 EFY) , 57 day in (2019 EFY) and currently as per data analysis it is 39 day that shows there is major performance gap in container handling service with the perspective of international maritime standard that is 31 days deference

In addition the primary data analysis result from questioner survey on doweling time shows that 60% of the respondents strongly agree that dwell time is an indicator to assess the performance of container handling service and indicates that 58 % of the respondents Operational dwell time at the port to be on average and slow . 66.7% of the respondent's transactional dwell time at the port to be on average, this is the total time taken to complete clearance processes. Additionally, 83% of the respondents rate storage dwell time to be average and slow . This is the decision based on allowing cargo to stay longer time in the port terminal. That the total average dwelling time lays on slow and average states that shows there is a major gap on doweling time . and existence of poor performance on dwelling time is also is the cause of additional port charge cost and a Couse for existence of congestion on the container yard

Therefore Dwelling time plays major role in determining container terminal performance efficiency.

Even if Modjo dry port, for example, a company set an objective of 20 days at the end of this budget year, this indicates that there should be an improvement on the dwelling time performance .

Descriptive interpretaion and descution Selected Factor port machnery productivety to answer the reserch question How does Port Equipment productivity affect container terminals service performance?

Port Equipment productivity: The value that is the number of container moves made per working hour, either for an individual machine or for the stock of a particular type of machine. And Port Equipment utilization: is one of the affecting factors in container handling service since the terminal's investment in cargo-handling equipment is very costly, equipment utilization is an extremely important performance measure and affecting factor. The utilization of any item or type of equipment is defined as the proportion of time that it was effectively deployed over a specified period.

When we see the Reach stacker productivity of mojo terminal port that is one of the dominant applicable port equipment Under secondary data analysis described that the actual productivity of the Reach stacker is 20.9 in 2019/20 that is approximately 21 TEU containers per hours. From the data it could be observed that as quantity of container served increased, fuel consumption cost and time spent on work by the machinery increased .and when this performance compared to international standard it is very low. Because the standard (ISO and Smith, Dan, 2012) estimated productivity of the reach stacker is up to 35 containers per hour (at maximum level); but in practical the score is found in the range 28 to 30 containers per hour on average.

In addition when we see primary data results from questioner survey to answer on ranking the performance of Reach stacker in terms of loading and unloading from Rail/trucks at the port of Mojo. The finding shows that 62% of the respondents rank the performance of Reach stacker on average statues , that concludes the performance of the port machinery in terms of loading and unloading of train/trucks at the port of Mojo has and average performance . and when we measure the aver all average yard port equipment operational performance efficiency 57 % of the respondents measure it is say satisfactory or medium , that indicates based on the questioner survey the performance of port machinery efficiency is on average and have some gap to be filled.

Descriptive interpretation and discussion Selected Factor competency of port stuff to answer How does human (manpower) factor effects performance of container handling service at mojo dry port terminals ?

On the assessment of man power productivity and its effect on performance of container handling operation through assessing the competency of terminal operators at Mojo dry port ? Finding reveals that out of 226 respondents,30% of the respondents assess terminal operators to be competent, 10% of the respondents assess terminal operators to be highly competent, 50% of the respondents assess terminal operators to be not competent, 10% of the respondents assess terminal operators to be some competent and uncertain were unanswered. This infers that terminal operators are not well trained and three is some gap on human power productivity . The existence of incompetency manifest on port machinery productivity and cost of fuel that manifest on container handling service cost ineffectiveness from customer prospective and it has also negative contribution for emerging of container congestion problem

Descriptive interpretation and discussion Selected Factor custom clearance processing time to answer What is the effect of custom clearance process on container terminal performance efficiency?

The study sought to assess the effect Custom Clearance time in port performance at the Port of Mojo .Finding reveals that out of 226 respondents,30% of the respondents assess customs clearance process time to have very high impact , 15% of the respondents assess to have high impact ,54% of the respondents assess to be average impact , 2% of the respondents assess to be low impact, 0% of the respondents assess to be very low impact, This infers that custom clearance time have average impact on container terminal performance. That indicates clearance processing time have some impact on transactional doweling time

Therefore As it is mentioned on analysis and result that , operational performance of Majo dry port container handling increased annually; however, the performance of container dwelling time stated that is (39 days) is not interesting. This means that as the volume of container dwell time increased; container congestion in the terminal increased, become inconvenient for effective space utilization and management of the terminal, create work burden on port operators and decrease port machinery productivity that increased operational cost by limiting or consuming more space and hence decelerate the service provision. Generally the performance of container handling service is decreased, as the dwelling time of container increased at terminal.

CHAPTER FIVE

SUMMERY, CONCLUSION & RECOMMENDATION.

5.1 Introduction

The final part of your research work constitutes the conclusion and recommendations. The Introduction contains and presents a brief summary of the main substance of the chapter. In general Chapter five has to have Four major sections namely summary, Conclusion and Recommendations. Moreover, Area for further research.

5.2. SUMMERY

Finally at the end Generally the objective of this study is to Assess Factor that affecting container handling service performance from the perspective of effective service time and cost parameter : a case study of the Mojo dry Port container terminal . Previous studies have revealed that container terminal performance is influenced by many factors which include but not limited to: port yard Crain , dwell time, infrastructure, custom practices and security measures, truck turnaround time, logistic reliability and others etc. The study thoroughly assessed these factors and discussed the extent to which they affect container terminal efficiency within the industry . The study targeted population included mojo dry port employees /custom duty employees at mojo dry port branch and customers who have direct involvement on the container handling service

The study used both primary and secondary data and employed descriptive and explanatory research design method because it enables the researcher to explore issues with each structured questionnaire and insure reliability on Factor that affect performance of container handling service that is dwell time , port yard capacity and container volume operational thrgoutput performance , port machinery availability and productivity , infrastructure that includes communication channel, custom processing time and competency of stuff factor are well described. Based on the study the major findings were:

Operational performance of Majo dry port container handling increased annually with average of 4.5% annually ; however, the performance of container dwelling time stated that is (39 days) is not interesting. Additionally, port machinery performance specifically the actual productivity of

the Reach stacker is 20.9 in 2019/20 that is approximately 21 TEU containers per hours and in terms of loading and unloading of rail /trucks at the Port of Mojo is on average statues.

Moreover, findings indicated that .As it relates to the significance of both physical and soft infrastructure in terminal operation, findings revealed that it is very important. The results indicated that the congestion problem of container operations at the port is on average. While findings revealed that the nature of congestion occurred sometimes. In reference to improving the infrastructure at the port in order to decongest container traffic, findings revealed that need some improvement.

Also, findings indicated that terminal operators at the port of Mojo port is in medium competency level that shows human factor have some impact on the operational performance Furthermore, findings . Findings revealed that the effectiveness of custom clearance processing time at the port is on average Which is also one of the attributing factor the container handling service performance.

5,3 CONCLUSION

This study aims to assess factors affecting container handling service performance efficiency. A case study of the Mojo dry Port terminal. The study tries to answer Container dwell time, in Modjo port for multimodal containerized cargo is very significant. An aggregate analysis shows that cargo dwell time exceeds a year for a significant proportion of traffic and average dwell time has been consistently more than about 40 days in the last five years. which plays great role on affecting performance of container handling service . This means that as the volume of container dwell time increased; container congestion in the terminal increased, become inconvenient for effective space utilization and management of the terminal, create work burden on port machineries and equipment or on port machinery productivity , increased operational cost by limiting or consuming more space and hence decelerate the service provision

The study also tried to differentiate which factors plays great role for container dwell time in Modjo dry ports. Based on respondents , productivity and availability of port machinery equipment , competency of port operational employees , infrastructure, custom processing procedure and time

are found to be an important factors in determining the performance of Modjo dry port container handling service . Furthermore; among those determinants, the overall average score of the

variables showed that cargo handling equipment, customs operations and port infrastructure are very important determinants of Modjo dry port performance.

5.4. RECOMMENDATION

After the analysis of the research findings of all the collected data, the researcher is pleased to advance the following recommendations:

- The organization have to focus on reducing storage dwell time because it enable as saving money that they had been spending on demurrage because reducing dwell times and demurrage fees are just the tangible benefits of having better visibility into your import containers

- Transactional dwell time is the second factor of dwell time that needs further studying to the concerning of the potential finance of importers, exporters & investors and government may facilitate loan.
- As we reduce container dwell time at port as a result we minimize container demurrage that we pay for shipping linear by foreign currency USD the government has to revise policy and take measurement.
- Investment for improvement of quality of Physical/ port infrastructure, system quality and presence of cargo handling equipment, will have a significant impact on reducing dwell time. Therefore, Modjo dry port ESLSE should invest more on it.

- Raising Awareness through a workshop/seminar for the port community and consumers of port services could be useful in explaining the direct and indirect consequences of dwell time.
- Operational hours are important in managing congestion and in improving dwell times. For this, not only do government agencies need to function during these times, such as Customs, but economic operators need to adapt their hours of operation as well.
- Initiate regular meetings of stakeholders in the port at the decision-making level. The intention would be to identify, discuss and decide on the implementation of key measures that should be implemented to reduce dwell time and improve port efficiency and effectiveness.

- It needs further research and developmental studies regarding logistics

5.4. DIRECTION FOR FUTURE RESERCHE.

5.4.1 Area for further research.

Improving the performance of container handling service at mojo dry port by reducing container dwell time factor is strongly associated with the reliability of supply chains and the predictability of service delivery for producers and exporters. The role of every stakeholder has to be further investigated and detail planned work is required in terms of alleviating problems related with container dwell time. In this study and also the role of research studies to identify knowledge gap and solutions to the problems are critical & timely issues

The three component not the only factors furthermore it needs deep research; Further research should be undertaken on the following areas: The nature of cargo (consumable, inputs, project,), The type of the commodity (perishability, chemical nature, The owner of the cargo/consignee (gov't, public union, private),Seasonality of the cargo. (Summer/winter, hot/rain, holiday, school/vacation). These areas have been identified for future research so as to contribute to the academic debate in Maritime Logistics in Global Supply Chain.

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APPENDICES

ADDIS ABABA UNIVERSITY SCHOOL OF COMMERCE

SCHOOL OF GRADUATE STUDIES
DEPARTMENT OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT

Survey Questionnaire to be filled by

Modjo Dry Port Community

Dear/Sir;

My name is Amare Tigabu and I am a graduate student at Addis Ababa university school of commerce , Department of Logistics and Supply chain Management. For my final project, I am examining "Factor Affecting performance of Container handling service for the case of Modjo dry port". Because your esteemed company is among the customers of the dry port, I am inviting you to participate in this research study by completing the attached surveys.

The following questionnaire has three sections and will require approximately 10 to 15 minutes to complete. In order to ensure that all information will remain confidential, please do not include your name. If you choose to participate in this project, please answer all questions as honestly as possible and return the completed questioner promptly (I personally collect it from your office). Participation is strictly voluntary and you may refuse to participate at any time.

Thank you for taking the time to assist me in my educational endeavors. The data collected will provide useful information regarding factors affecting container dwelling time which determines the performance of Modjo dry port.

Completion and return of the questionnaire will indicate your willingness to participate in this study. If you require additional information or have questions, please contact me at the number listed below.

Thank you in advance for your time!!!!

Amare Tigabu
Phone number: +251911310681

General Instruction

. Answer close ended questions by putting (□) mark

. Answer close ended questions by putting ({ }) mark

. Write your answer in the space provided for open ended questions

Part I: Background Information of Respondents

1. Age : _____

2. Gender: □ Female □ Male

3. Highest educational level obtained: □ Diploma / Level IV □ First Degre
□ Masters and above

4. How long have you been in this organization /sector ? _____

5. Marital Status; □ Single □ Married
□ Divorcee □ Wwidow

6. Employment Group: □ Dry port □ Custom/regulatory office □ Customer

Part II: Questions regarding Factor Affecting Container handling service at Modjo port and Terminal

This section deals with customer perceived factors affecting container dwelling time of Mojo dry Port Therefore, based on your experience at the port please rate the significance of each component /factors which affects container dwell time of Mojo dry port . Please mark or encircle the value level of your perception in choice front .

To what extend do you agree or disagree with the following statement.

7) Container Terminal Efficiency can be measured by the level of increase in inputs and throughput.

1) = strongly disagree { }
2) = Disagree { }
3) = No opinion or uncertain { }
4) = Agree { }
5) = strongly agree { }

8) How do you assess the throughput of container cargo at the Port of Mojo currently?

1) = Very low { }
2) = Low { }
3) = Moderate { }
4) = High { }
5) = Very high{ }

9) How do you grade the current performance of container terminal at the port of Mojo?

1) = Very low { }
2) = Low { }
3) = Moderate { }
4) = High { }
5) = Very high{ }

10) How could you measure yard port equipment operational performance efficiency?

1) = Very poor { }
2) = Poor { }
3) = Average { }
4) =Good { }
5) = Excellent { }

11) The extent of agreement or disagreement as to whether dwell time is one factor that affect container terminal performance at the Port of Mojo?

1) = Strongly disagree { }
2) = Disagree { }
3) = No opinion or uncertain { }
4) = Agree { }
5) = Strongly agree { }

12) Haw do you evaluate the performance of operational dwell time at the Port of Mojo?

1) = Very slow { }
2) = Slow { }
3) = Average { }
4) = Fast { }
5) = Very fast { }

13) Haw do you evaluate the performance of Transactional dwell time at the Port of Mojo?

1) = Very slow { }
2) = Slow { }
3) = Average { }

4) = Fast { }
5) = Very fast { }

14) Haw do you evaluate the performance of Storage dwell time at the Port of Mojo?

1) = Very slow { }
2) = Slow { }
3) = Average { }
4) = Fast { }
5) = Very fast { }

15) How do you assess the congestion of container operations at the port of Mojo?

1) = Very bad { }
2) = Bad { }
3) = Average { }
4) = Good { }
5) = Very good { }

16) How would you describe the nature of congestion at the port currently?

1) = Hardly ever { }
2) = Occasionally { }
3) =Sometimes { } ‘
4) = Frequently { }
5) =Almost always { }

17) How do you assess the effect of congestion on container reshuffling work and cost of port charge at the port of Mojo?

1) = Very low { }
2) = Low { }
3) = Moderate { }
4) = High { }
5) = Very high { }

18) Suggestion on the Couse of congestion is Infrastructure , Terminal container free time , Storage charge cost , Operation inefficiency, or other at the port of Mojo?

1) = Infrastructure { }
2) = container free time { }
3) = Storage charge cost { }
4) = Operation inefficiency { }
5) = other { }

19) How do you assess the competency of terminal operators at Mojo dry port ?

1) = Not competent { }
2) = Some competent { }
3) = Uncertain { }
4) = Competent { }
5) = Highly competent{ }

20) How do you assess effect/ impact of Custom Clearance processing in the performance of container handling service at the Port of Mojo?

1) = Very low { }
2) = Low { }

3) = Moderate { }
4) = High { }
5)= Very high { }

21) What is the average number of days used in clearing containers at the port currently?

(1) Within 24 hours { }
(2) 1-3 working days { }
(3) 4 – 6 working days { }
(4) 7 – 9 working days { }
(5) 10 – 12 working days { }

22) How do you assess the significance of both physical and soft infrastructure in terminal operation

1) = Not important { }
2) = somewhat important { }
3) = important { }
4) = very important { }

Part 3: Open Ended Questions:

1. What are the basic reason that customer abandoned their cargo in the dry ports?

_____
_____
_____
_____

2. In your point of view what are the basic factors that can increase container dwell time?

_____
_____
_____
_____

3. What are your suggestions for future to reduce container dwell time of Modjo Dry Port?

_____
_____
_____
_____

4. If you have additional suggestion please explains here?

_____
_____
_____
_____

Thank you

Data validity and Reliability Statistics

Operational performance or yard capacity Variable		Total Respondent Count	Total Respondent present
Container Terminal Efficiency as performance indictor	Strongly agree	23	10%
	Agree	34	15%
	uncertain or No opinion	79	35%
	Disagree	52	23%
	Strongly disagree	38	17%
Throughput of Container Cargo at the Port of Mojo	Very Fast	15	7%
	Fast	120	53%
	Average	90	40%
	Slow	0	0%
	Very Slow	0	0%
Current Performance of Container Terminal at the Port of Mojo	EXCELLENT	11	5%
	GOOD	81	36%
	AVERAGE	113	50%
	POOR	14	6%
	VERY POOR	7	3%

Reliability Statistics	
Cronbach's Alpha	N of Items
0.878	9

Dwelling time variable		Total Respondent Count	Total Respondent present
Operational Dwell Time	Very Fast	23	10%
	Fast	34	15%
	Average	79	35%
	Slow	52	23%
	Very Slow	38	17%
Storage Dwell Time	Very Fast	0	0%
	Fast	23	10%
	Average	79	35%
	Slow	108	48%
	Very Slow	16	7%
Transactional Dwell Time	Very Fast	0	0%
	Fast	25	11%
	Average	151	67%
	Slow	50	22%
	Very Slow	0	0%

Reliability Statistics	
Cronbach's Alpha	N of Items
0.875	9

Port equipment availability and productivity Variable		Total Respondent Count	Total Respondent present
performance of Reach stacker in terms of loading and unloading from Rail/trucks at the port of Mojo?	VERY GOOD	18	8%
	GOOD	68	30%
	AVERAG	140	62%
	POOR	0	0%
	VERY POOR	0	0%
yard port equipment operational performance efficiency?	Very effective	0	0%
	Effective	23	10%
	Average	140	62%
	Ineffective	45	20%
	Very ineffective	18	8%

Reliability Statistics	
Cronbach's Alpha	N of Items
0.833	6

Competency of terminal Operators Variable		Total Respondent Count	Total Respondent present
Competency of terminal Operators	NOT COMPETENT	113	50%
	SOME COMPETENT	23	10%
	UNCERTAIN	0	0%
	COMPETENT	68	30%
	HAILY COMPETENT	23	10%

Reliability Statistics	
Cronbach's Alpha	N of Items
0.866	3

Custom processing time and impact Variable		Total Respondent Count	Total Respondent present
Custom processing time and impact	**Very high**	113	50%
	High	23	10%
	Moderate	0	0%
	Low	68	30%
	Very low	23	10%

Reliability Statistics	
Cronbach's Alpha	N of Items
0.799	3