DRY PORT LOGISTICS PERFORMANCE OF MODJO DRY PORT

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Thesis for the Partial Fulfilment of the Requirements of Master of Arts Degree in Logistics and Supply Chain Management

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Declaration

I, **Sileshi Alebachew**, the under signed, hereby declare that the work contained in this thesis is my own original work and that I have not previously in its entirety or in part submitted at any university for a degree.

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This is to Certify that the thesis prepared by **Sileshi Alebachew**, entitled: **Dry Port Logistics Performance of Modjo Dry Port** submitted in partial fulfillment of the requirements for the Degree of Master of Arts in Logistics and Supply Chain Management complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

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Tariku Jebena (PhD)	_____	_____
Research Advisor	Signature	Date

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List of Acronyms and Abbreviations

ASYCUDA	Automated System for Customs Data
CCTV	Closed-Circuit Television
ESCAP	Economic and Social Commission for Asia and the Pacific
ESLSE	Ethiopian Shipping and Logistics Service Enterprise
GDP	Gross Domestic Product
LLDCs	Landlocked developing countries
LPI	Logistics Performance Index
MDP	Modjo Dry Port
SEZ	Special Economic Zone
SPSS	Statistical Package for the Social Sciences
TEU	Twenty foot Equivalent Unit
TOS	Terminal Operating System
UNCTAD	United Nation Conference on Trade and Development
UNESCAP	United Nations Economic and Social Commission for Asia and Pacific
UN-OHRLLS	United Nations Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and the Small Island Developing States.
WCO	World Customs Organization

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Abstract

The purpose of this researches study is evaluating the dry port logistics performance of Modjo dry port. Dry port logistics performance measurement has become more complex due to the fact that ports work today as nodes of global logistics chains. One of the great challenges of ports it is how to measure their performance. The major problem observed in MDP is cargo delays and waiting times at dry port. Ethiopia is one of landlocked country in Africa. Dry ports are important for landlocked country to minimized transportation cost and competitive their export product throughout the world. The country develop the dry ports for adequate supply chain routine for end to end speedy trade facilitation, to increase the competitiveness of local products , and to increase economic development.

In this paper present the inland Modjo dry port logistics performance. The study uses some logistics activities and performance indicators for dry port logistics performance these are Customer response, Inventory Planning & management, Transportation, Warehousing, Customs, Port Infrastructures, Quality of logistics service, and Timeliness. Since the dry port is currently used as one of facilitate international trade of the country product, to conduct this research the research objective has study the logistics performance of Modjo dry port operation. The research is descriptive and explanatory in its type the data was collected by distributing questioner for 83 sample port worker of Modjo dry port by random sampling technique. The data was analysed using SPSS, EXCEL and the findings was presented by table, graph and chart. This research is study on Modjo Dry port and future research study considers other dry ports of the country.

***Key Words**: Dry port, Performance Indicators, Port Infrastructure, throughput, logistics*

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CHAPTER ONE

INTRODUCTION

This section presents the development of the concept of dry ports, the problem the research attempt to investigate, the basic research question to be addressed, the objective of the study, significance of the study, the scope of study covered and finally organization of the study.

1.1 Background of the study

In today competitive and globalization trade fast and reliable facility of goods are important. To help country import and export trade better and cost effective way are using of dry ports. Ethiopian is one of landlocked country, the country use only Djibouti port for international trade. Currently there are seven dry ports and terminals owned constructs and operate by public enterprise of Ethiopian Shipping and logistics Service Enterprise (ESLSE). As one of the landlocked developing countries Ethiopia continuously face the challenge of physical isolation, supply chain related barriers from the sea and the high costs of trading with the rest of the world (UN Economic Commission for Africa, 2011).

Currently, the landlocked developing countries (LLDCs) are a group of 32 countries found in Africa, Asia, Europe and Latin America. In Africa 16 countries: Botswana, Burkina Faso, Burundi, Central African Republic, Chad, Ethiopia, Lesotho, Malawi, Mali, Niger, Rwanda, South Sudan, Swaziland, Uganda, Zambia, and Zimbabwe. In addition to the location and the characteristics of their economy, dependency on transport infrastructure to some extend depends on the importance of international trade in the national economy. Overall, LLDCs are more trade dependent than their transit developing neighbours as their trade share of GDP is about 3 percentage points higher. LLDCs have, on average, higher import, but lower export and total trade as a percentage of their GDP than the global average, but there are important differences between the trade dependence of LLDCs by region. (UN-OHRLLS, 2018).

The LLDCs face development challenges related to their geographical disadvantages. Lack of territorial access to the sea, remoteness and isolation from world markets, multiple border crossings, cumbersome transit procedures, inadequate infrastructure and high transit costs continue to impose serious constraints on the overall socio-economic development of landlocked developing countries. Overall, the level of development in LLDCs is about 20 per cent lower than it would have been if they were not landlocked (UN-OHRLLS, 2019).

For Ethiopia the idea of dry port is emerging in the country to tackle the constraints related to ports and for cost effective use of the transport infrastructure and to improve trade logistics of the country. The need for freight and logistics system is, therefore, to and from ports, and logistical activities at dry ports (Fekadu, 2013). Ethiopia dry port and terminals range from small loading/unloading platforms to large freight centers offering a wide range of trade and transport related services.

Some 80 per cent of international trade is channeled through ports. Thus, ports play a key role in connecting the many developing countries that have port communities to international trade. Ports as critical nodes in the ever-more complex and sophisticated logistics networks that drive the transport of goods around the globe are made up of a number of subgroups that together constitute the port community. (UNCTAD, 2016).

Competition in the 21st century is no longer a competition between enterprises, but the supply chain and supply chain competition. With the era of the supply chain management, modern port logistics shows features of integration, intensification and aggregation. Port logistics marketing based on supply chain management tends to maximize customer value as well as supply chain value with the arrival era of supply chain management, port holds a very important strategic position in the global supply chain system, and it’s playing an increasingly active role. (Lei Wang, 2011)

Traditionally, ports have been in the focus as logistics center of maritime logistics chains, but changes in production patterns are supported by the development of the rapid transport of goods over long distances. As a result, the relevance of port hinterland transport, high

utilization of transport resources and infrastructure through the consolidation of goods lows and extending the influence of ports in their hinterlands to increase their competitiveness has become even more important.(Rickard B., Gordon W., and Kevin C., 2012)

Inland logistics centres, and dry ports are playing an increasingly pivotal role in the multimodal transport network that sustains economic activity by delivering key inputs to local enterprises and facilitating their exports of raw materials, semi-manufactured products, and finished goods (Heaver, 2002; Notteboom and Rodrigue, 2005)

Ethiopia accounts for more than 80% of all Port traffic. The key link is to Addis Ababa and the surrounding area where about 90% of inbound containers are processed at the Modjo dry port. (World Bank, 2017a).

In this study focus on dry port logistics performance of Modjo dry port. Its facilitate most of country international trade goods under this port. Dry port and terminal can speed the flow of cargo between sea port and major land transportation networks, creating a more central distribution point. To get the highest benefit from those dry ports, the efficient and effective logistics performance of the dry ports is necessary and to do that it is important to identify factors which influence the logistics performance of dry ports. Therefore, study on the logistics performance of MDP.

1.2. Background of the Organization

The first dry port in Ethiopia was established at Modjo, nearly 75 km East of Addis Ababa, and started operations in the first half of 2009. Modjo dry port gets within Ethiopian Shipping and Logistics Service Enterprise (ESLSE) under port and terminal sector. Modjo dry port has been identified by the government as the key node for the emerging Ethiopian intermodal trade logistics system. The port of Modjo is the first and the largest operational container dry port in Ethiopia.

The Modjo dry port and terminal facility is on expansion and development activities. Since the launch of multi-modal operations, the volume of cargo handled at Modjo has increased on progress. Currently the port has a capacity to handle 18,000 containers in measuring 20-

ft TEU. Modjo dry port is connect to Djibouti and were built with the purposes of providing and delivering the following services :- receiving and delivering cargoes, cargo loading and unloading, stuffing and unsnuffing of container goods, temporary storage for import and export cargoes, container cleaning and maintaining, weight bridge, customs control and clearance, banking and insurance, container depot service and engage in other related activities conducive to the achievement of its purposes. And this move has helped the country to save the foreign currency and increased its efficiency in import and export operation.

Now the dry port has reached the capacity of accommodating more than 18,000 containers at a time, with 1000 containers in and out per day ESLSE annual report 2018. The port occupies a total area of 150 hectare while 31.7 hectare land area is used for container terminal services, Out of this 85% area used for container and trucks service and 15% of land used for operational activity. One time container handling capacity of Modjo dry port is more than 18,000 TEU and its annual container handling capacity has reached up to 136,038 TEU. It lies on the "Ethio-Djibouti corridor." It is the first and multifunctional inland port where all types of freight are loaded, unloaded, stored and handled in the appropriate way. (World Bank, 2017a).

Modjo dry port handles more than 78 % of the nation's import-export destination of Ethiopia, which was established in 2009 with the capacity of accommodating only 700 containers at once. As a landlocked country, Ethiopia is using Djibouti's and other neighbouring countries ports. In addition to the challenges with trade imbalance and the dearth of foreign currency, the payment for ports with additional cost of containers was a heavy burden for this developing country. Thus Modjo dry port is great important for country international trade logistics chain of trade.

The MDP endeavours to make the services more efficient, fast and convenient to port user importers, exporters and play a crucial role in the logistics value chain of the country.

1.3. Statement of the Problem

The development of a Dry port concept in Ethiopia is to provide effective and efficient foreign trade cargo movement to and from the sea ports, to promote competitiveness of the Ethiopian international trade through reduced corridor costs and save foreign currency for country. The logistics performance of dry ports and terminals can significantly affect a country's trade competitiveness.

The World Bank (2017) reports states that "The main bottleneck on the logistics supply chain for containerized imports is currently the dry port at Modjo. There are significant operational constraints at the Modjo dry port including:- a)insufficient cargo handling equipment b) lack of facilities for stuffing of export containers and unsnuffing of import containers, c) lack of proper systems for the management of the facility, leading to delays in locating containers and necessitating increased moves of boxes; the port is operating without a proper TOS(Terminal Operating System) and gate system d) increased congestion around the facility due to poor traffic flow patterns and lack of parking spaces for trucks; e) Poor port security as evidenced by the absence of CCTV; and f) lack of facilities and readiness to handle inbound and outbound railway traffic when commercial operations start in early 2017.

Under investment in facilities and equipment, poor operational procedures and control, and lack of Yard management systems are responsible for the excess time for truck turnarounds and for 35%-40% of the container dwell time. For bulk imports the key weakness is the lack of storage and handling facilities in Ethiopia."

According to the report of enterprise May, 2018 Modjo operational performance, the enterprise (ESLSE) showing that the dry port problems broadly. Such as utilization of resources, absence of control, procedures while delivering services, poor ICT infrastructure and communication system. The port user customers are strongly complain and led to decreasing customer satisfaction for the services delivery by port. Thus the port services are unable to meet performance criteria of the prompt delivery and reliable services.

The poor performance of port management and operations, together with other procedural inefficiencies along the logistics chain, and imbalanced freight rates that shipping lines charge because of empty backhaul cargo, are all contributing factors to high transport costs (Bofinger *et al*., 2015).

Modjo dry port is the largest and the main dry port of the country is problem related with performance. Modjo dry port face continued pressure to handle higher throughput, improve productivity, and adopt new technology and ICT systems that can meet the increasingly demanding service standards expected by importers, exporters, logistics companies, freight forwarders and shipping operators.

The purpose of this research is to evaluate the dry port logistics performance of Modjo dry port. Focus on some logistics activities and performance indicators of the dry port logistics performance.

1.4. Research Questions

Particularly this research explores the following questions, and analyzed the dry port logistics performance.

1. What is the transport management logistics performance of MDP?
2. What is the inventory planning and management performance of MDP?
3. What is warehouse management logistics performance of MDP?
4. To what extent customer's service responses are practice by MDP?
5. What are the dry port logistics performances of MDP?

1.5. Objectives of the Study

1.5.1. General Objective

The general objective of the study is to evaluate the logistics performances of Modjo dry port.

1.5.2. Specific Objectives

The specific objectives of study are:

1. To determine the transportation management performance of MDP.
2. To measure inventory planning and management performance of MDP.
3. To measure the warehouse management performance of MDP.
4. To assess the customer response management practice of MDP.
5. To evaluate dry port logistics performance of MDP.

1.6. Significance of the Study

In today competitive and globalized world the business enterprise evaluate their performance to be competitive. Thus performance measurement is important to identify the enterprise level and to improve the problem related with operational. The Modjo dry port is one of the large and the major trade logistics chain of the country. Its logistics performance affected not only the organization also affect the country economy at all. Hence, this research is to have the following importance.

- The study will importance to port authorities and other concerned body by providing information on logistics activities to support their decision regarding performance of MDP.
- Assess what are major factors for the MDP poor logistics performance and will suggest solutions for the problem related with operation.
- The study can also be useful for academicians to study further in the area.
- The finding assists dry ports to improving the quality of their services and logistics performance.

1.7. Scope of the Study

The study tries to see some logistics activity and indicators factors of performance of dry ports and how to affect their logistics performance operations. Currently there are seven operational dry ports in Ethiopia; these are Modjo, Semera, Kombolcah, Mekelle, Dire Dawa, Kality, and Gelan. Each dry port there are difference in sizes of dry port terminal areas, in TEUs handled a year, infrastructure, or in range of services offered and so on;

however this research is limited to study the logistics performance of Modjo dry port only. MDP is under port and terminal sector in Ethiopian Shipping and Logistics Service Enterprise (ESLSE).

1.8. Limitation of the Study

The study is focuses on dry port logistics performance of Modjo dry port and terminal. The study estimated encounters the following constraints and limitations:

Firstly, this study focuses only in Modjo dry port workers and hence the result from this study cannot be showing all dry ports logistics performance of the country.

Secondly, due to finance and time constraints the study data is not collected from the entire population. The study also investigates only some parts of logistics activities and indicators of dry port performance.

Finally, the study based on available information from primary and secondary sources. However, some respondents were unwilling to fill the questionnaires and unhappy due to fear of Coronavirus disease.

1.9. Definition of Terms

Dry port: A dry port is also known as an inland intermodal terminal directly connected to seaports with high capacity transports means, where customers can leave and pick up their standardized units as if dealing directly with a seaport (Roso, 2009).

Multi modal transport: means the carriage of goods by two and more different modes of transport on the basis of the multimodal transport contract from place in origin country at which the goods are taken in charge by the multimodal transport operator to the place designated for delivery situation in a different country.

Logistics: is the function responsible for the flow of materials from suppliers into an organization, through operations within the organization, and then out to customers. (Waters, 2003)

Logistics Performance Index (LPI): is a crucial part of global efforts to better understand logistics performance in the context of increasingly complex supply chains. Provides insight into the drivers of overall logistics performance (Jean *et al*., 2018)

Port dwell time: is the total time elapsed form when the cargo arrives at the port to when it leaves. (Merckx, 2005)

1.10. Organization of the study

The research paper comprises five chapters. The first chapter outlines the introductory part including with the general background, statement of the problem, significance and objectives of the study and questions that would answered by the study.

The second Chapter tells us the relative literature review of the study, which is mainly focuses on the dry port logistics performance, which deals with the subject matter of the issue and related concepts essential to the study. The third chapter is about research design and methodology, which tells us about the research design, sampling techniques, the source of data, data collection method, and data analysis techniques.

The fourth chapter is the core part of the research which deals with the analysis of the collected data and its findings. Finally, the fifth chapter deals with the summaries of key findings concluding remarks and recommendations suggested for solving the problem stated in the introduction part.

CHAPTER TWO

RELATED LITERATURE REVIEW

This section contains various literature views presented by different scholars in relation to dry ports benefits, roles, functions and performance. The literature has tried to assess logistics performance of dry port.

2.1 Theoretical Literature Review

2.1.1 Definition, Operation & Purpose of Dry ports

The word dry port has been defined by many authors and the definitions reflect the broad view of the concept from different perspectives. The definition suggested by United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP, 2006) describes as*:*

Dry port refers to a defined inland location for the consolidation and distribution of goods that has functions similar to those of a seaport, and which includes customs clearance services. Seaport functions that could be expected to be typically present at these Dry ports include container (and possibly bulk) handling facilities; intermodal infrastructure connections; a geographical grouping of independent companies and bodies dealing with freight transport (including, for example, freight forwarders, shippers and transport operators); and the provision of accompanying services such as customs inspections, tax payment, storage , maintenance and repair, bank and information communication technology connections.

FDT (2007) use a broader definition for a dry port, including also the services that are typically provided in the seaport (e.g. customs clearance, container maintenance and repair, empty depot): *A dry port is a port situated in the hinterland servicing an industrial/commercial region connected with one or several ports by rail, road or inland water transport and is offering specialized services between the dry port and the overseas destinations. Normally the dry port is container and multimodal oriented and has all logistic services and facilities needed for shipping and forwarding agents in a port.*

Dry ports are located inland from seaports but are linked directly to the sea port(s) or, in the case of international land movements, are in contact with the source of imports and destination 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. (UNCTAD, 1991)

A dry port is an intermodal terminal situated in the hinterland servicing a region connected with one or several ports by rail and/or road transport and is offering specialized services between the dry port and the overseas destinations. Normally the dry port is container oriented and supplies all logistics facilities, which are needed for shipping and forwarding agents in a port. (Lina, 2009)

An Inland port is located inland, generally far from seaport terminals. It supplies regions with an intermodal terminal or a merging point for traffic modes- rail, air, and truck routes- involved in distributing merchandise that comes from water ports. An inland port usually provides international logistics and distribution services, including freight forwarding, customs brokerages, integrated logistics, and information systems. Normally the dry port is container and multimodal oriented and has all logistics facilities, which is needed for shipping and forwarding agents in a port. (Andrius J. and Aidas V., 2007)

Lina T. (2009) describes a transport chain, based on the shipping, does not contain a dry port, then the operational procedure can be the following: the chain starts from the cargo being either containerized or palletized at shipper's warehouses. Then it is transported to the consolidated warehouse by truck where cargo is placed into containers if it is not containerized yet. Afterwards containers are transported to the customs via rail or road and to the port of departure, where all port related operations are accomplished and the cargo is shipped to another port. At the cargo at a port of reception is unloaded and transferred to the storage yard where the customs clearance is provided. After that the containers are moved from the port to transshipment facility or to the consignee's warehouse (Tsilingiris, 2006)

However, when a dry port is a part of the transport chains (see Figure 2.1); the possible scheme of the operations is the following. For exports, the goods are either containerized or

palletized at the shippers' warehouses and transported to a dry port where cargo is placed into containers in the case it is not done previously. The formalities of export customs are completed and containers are loaded on the train and dispatched by rail to the port of departure. All charges are collected at the dry port, also all customs procedures are completed at this point and the exporters or importers do not need to do anything at sea port (UNCTAD,1991)

For imports, containers are unloaded from the ship at the port of reception, certain operations are being carried out and containers are being moved to a dry port. In a dry port the customs clearance is executed, afterwards, other services are carried out. Finally the containers are dispatched to consignee's warehouse. (Lina, 2009)

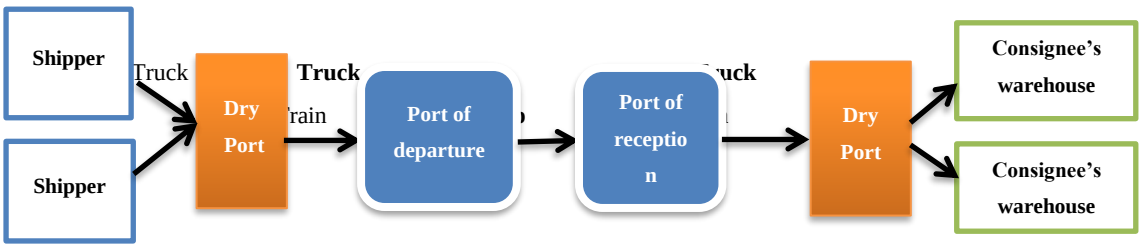

Figure 2. 1 Transport Chain with Dry ports.

Source :- (Lina, 2009)

2.1.2 Dry Port Facilities

A dry port provides services for the handling and temporary storage of containers, general and /or bulk cargoes that enters or leaves the dry port by any mode of transport such as road, railways, inland waterways or airports. A dry port of international importance shall refer to a secure inland location for handling temporary storage, inspection and customs clearance of freight moving in international trade. As per the roles of dry ports in economic corridors issued by the transport division, UNESCAP, they have many purposes like: Help bring economic development from coast area to

hinterland (particularly for LLDCs) and Dry ports can grow to SEZs. (G.S Dwarakish, and Akhil M. Salim 2015).

The range of value adding services that a dry port can provide reflects an evolution by which dry ports no longer serve necessarily a determined maritime port exclusively but are also embedded into the supply chain that governs trade between specific areas or countries. Significantly, this is important in view of dry ports serving landlocked countries. While dry ports are essential in providing these countries with efficient sea access, they are also bound to play in the future an important role in enhancing trade between them. (United Nation, 2014). The main function of dry ports is to support the movement of international trade between inland points of origin or destination and seaports. (ESCAP 2018)

The basic function of ports is transport, transshipment, loading and unloading, storage and distribution, which are closely related to port activities. With the advantage of location, many important ports have adopted the concept of –front port, back factory to provide processing, assembling and cargo sorting and other value-added services, which can not only reduce the transport cost and the packaging damage during the handling and transport, but also ensure the quality of products. Ports function as distribution or dedicated areas for both global logistics services and value-added logistics (VAL) (Harding and Juhel 1997). They can evolve from a transshipment center to a complex of functions within a logistics system (Notteboom and Winkelmans 2001)

The concept of dry port was firstly proposed by the European Commission in 1991. In terms of its functionality, it provides four fundamental tasks. The first one is to reduce costs of export by foreign trade enterprises. The second one is to improve the efficiency of logistics service. The third one is to provide smooth logistics channel .And the last one is to promote economic development in the hinterland (Roso, 2006).

The core function of dry port is to expand the seaport function to the hinterlands and achieve the “big clearance” mode. This simplifies and standardizes inter-customs declaration processes by optimizing the checking process within the clearance

procedures. The cargoes of importers or exporters can be declared and released at the dry ports, and no further checking is required at the seaport. It is called 'One Checking' system. The public sectors include customs, inspection and quarantine, port agents, while private sectors include the shipping lines, more specifically inland freight transport companies, seaports, shipping lines, freight forwarders, and Container Freight Station (CFS) operators. The dry ports' functions are completed by these public and private sectors. (Yunhua *et al*, 2015)

Activities in the Dry port can be divided in the following main groups:- Receipt and dispatch of cargo, Truck operations, Loading/unloading of cargo/containers to and from trains, Customs clearance, Gate checks and security, Storage of cargo and containers, Information flow and communication, Record keeping and data storage and Billing and cash collection. (FDT, 2007)

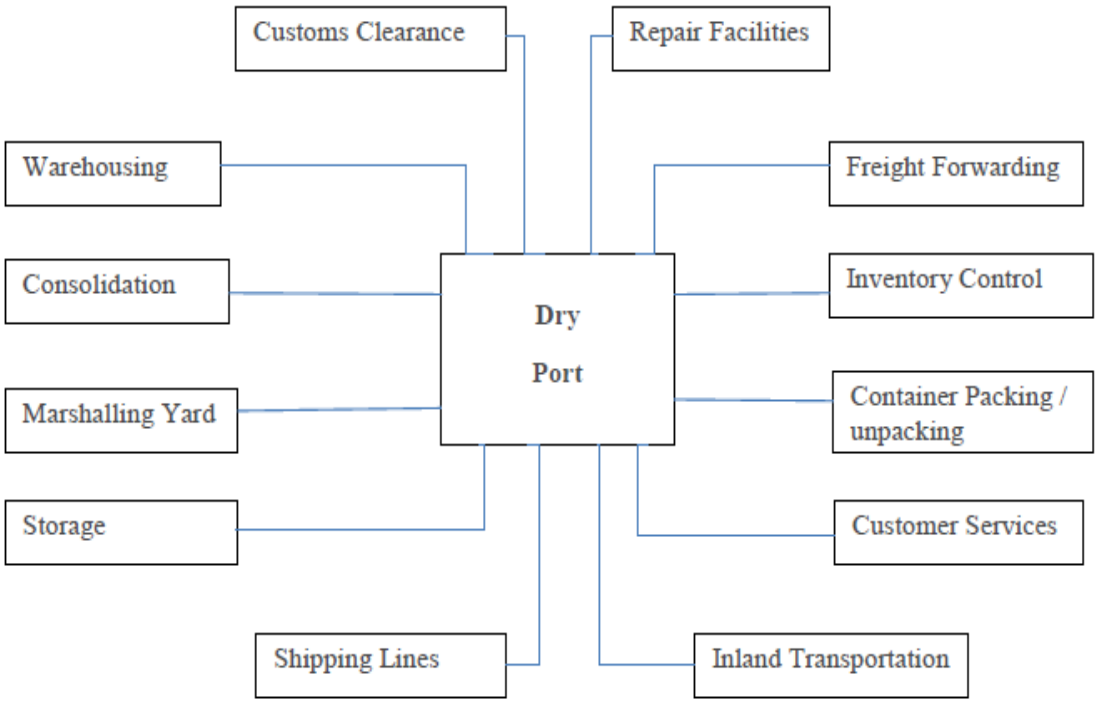

Figure 2. 2 Functional structures of Dry Ports

Source :- (UNCTAD 1991)

2.1.3 Potential Benefits of Dry Ports

The benefits associated with dry ports and intermodal transport usually fall within the categories of cost-efficiency, environmental performance and logistics quality (Bergqvist 2013). Dry ports could significantly contribute to the development of an international integrated intermodal transport and logistics system. (ESCAP 2018) Conventional inland terminals provide the transshipment of goods between modes as a basic service. (Rickaard B., Gordon W. and Kevin C.2012*)*

Ports are a key component of the logistics chain and, therefore, their operation has a direct effect on relevant economic variables such as export competitiveness and final import prices, thus affecting economic development according to Tovar *et al*. (CCRP Working Paper No.7)

With the development of global multimodal supply chains, dry ports have assumed increasing importance in facilitating market development, seamless integration and closer collaboration between the different stakeholders of the supply chain and of transport networks. (Gujar Girish Chandrakant 2011)

Dry port is very convenient for all the participants of the transport industry. Firstly, it allows unloading the sea terminal. Secondly, storage of containers (as well as other goods) in the dry port is much cheaper. Thirdly, significant savings on customs payments paid directly before the export of goods from the dry port, where the goods can be stored for a long time. Fourth, it improves the logistics of goods (the possibility of formation of consignments) and has many other advantages. (Natalia L., Milos P., Alexander O., 2019)

The benefits arising from setting up dry ports and related developments differ for each case considered, depending upon the existing procedures, charges levied, routes used, facilities provided and local conditions. The benefits and potential benefits may be summarized as follows (UNCTAD, 1991):

a) *Increased trade flows*: beneficial to a region or to the country as a whole.
b) Lower 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. Greater use of containerization, with boxes routed through dry ports, encourages a reduction in handling costs reroute, as well as less ship time and port costs. Most transport tariffs taper off with increasing distance; hence the cost per unit of distance normally decreases as the length of the haul increases. In traditional transit practice, it is usual for each leg within a through haul to be charged separately. With door to door transport of goods via a dry port, it may be possible to negotiate lower movement costs when the quoted rates apply to the whole length of the haul, there by yielding advantages as a result of the "taper" effect, thus reaping economies of scale in terms of transport distance.

c) *Avoidance 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 loading 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 the goods through the maritime port. Hence the importer or exporter does not need to employ a clearing and forwarding agent.

d) *Avoidance of storage, demurrage and late documentation fees:* In traditional transit systems, goods are frequently held up at maritime ports or at land borders 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 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.

e) *Possible avoidance of the need to extend the period of marine insurance*: The validity of the period of marine insurance usually extends to 60 days after completion of discharge over side of the goods insured from the sea-going vessel at the final sea port of destination. With a dry port, delays in excess of 60 days should not occur, and the payment of any additional premium is thus averted. The marine insurance could end at the dry port itself if it has been designated at the final, destination. Such coverage could also cease at the dry port if long-term storage takes place there or if the goods are kept there for distribution. An extension of coverage may be required, however, if goods are consigned to a dry port.

f) *Optimal use –road and rail transport*: If substitution of existing long-distance road haulage by rail transport can be encouraged, there may be savings to be gained in transport costs. This possibility can be assessed by finding the difference between rail and road through-transport costs.

g) *Use of national rolling stock*: Benefits may also be gained when a dry port enables cargo to be transshipped more readily from foreign-owned to domestic –owned rail wagons, if necessary, such that the demurrage or hire-rate on foreign wagons is avoided when wagons are returned quickly to the foreign railway. It should be noted, however, that the purpose of the dry port and the combined transport document is to reduce transshipment with its attendant handling costs to a minimum.

h) *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.

i) *Greater use of containers:* The establishment of a dry port with container-handling facilities can encourage greater use of containers.

j) *Lower customs staff costs:* As dry ports allow customs clearance to be concentrated at a few sites, it may be possible to affect the same volume of clearance with

reduced customs involvement, especially where a dry port is accessed by two or more gateway ports.

k) *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 cargoes, maritime ports also gain the advantage of higher berth through-puts, thus reducing the cost per unit of cargo handled.

l) *Inventory savings*: One of the main purposes of the dry ports is to speed up the movement of cargo and to increase the predictability of arrival times. Therefore, dry ports have implications for the volume of goods in transit at any one time, the level of stocks held with in a country and the timing of payments for imports and exports. The date on which domestic exporters receive payment for their goods will depend upon the negotiated terms of trading deals. Owing to uncertainties in transit times and the way in which exchange rates fluctuate, purchase prices of exports from land-locked countries tend to incorporate a risk premium to cover exchange rate fluctuations while the goods are in transit. More reliable delivery and shorter transit time will reduce this risk premium. Rapid and reliable transit enables importers or exporters to hold lower stock levels of commodities. Savings will also be made through the interest that can be earned on the working capital released when lower stock levels are maintained.

m) *Benefits of unit trains*: Dry ports encourage the operation of unit trains. The major sources of benefits of introducing unit train operations in place of traditional goods trains are that shunting costs at the terminals and at the intermediate marshaling yards can be avoided and higher wagon and locomotive utilization rates achieved. The introduction of unit trains is most appropriate when fright flows between two points are substantial, fairly continuous and relatively balanced.

n) *Improved communications*: simple, rapid transfer of documentation and information, fundamental to efficient cargo transit, may be achieved by linking the

introduction of computerized freight tracking or customs clearance to the provision of a dry port. The benefits are strictly attributable to the introduction of computerized procedures. With the introduction of a computerized customs charging and recording system, such as UNCTAD's ASYCUDA, incorporating the dry port, benefits may be reaped in the form of a higher ratio of duties collected, fewer unintentional errors through using the wrong calculation factors quick and accurate automatic summary data compilation for statistical purposes and probably less scope for avoidance of customs duties or malpractice in collection. The computerized information system can also be suitably programmed to furnish important commercial, financial and other informative data needed by customers using the dry ports.

o) *Additional benefits*: Many of the benefit of dry ports may be of such a nature that a monetary value cannot be attributed. Benefits which are difficult to quantify, isolate or measure in monetary terms include the following: -

Dry ports enable greater national control to be exercised over transit operations, with reduced paperwork and more accurate documentation, there is less scope for confusion or lost papers, fewer delays, reduced cargo loss and better flow of information, importers and exporters may recognize the advantages of greater reliability in the transit routes. (This may be translated into a tangible benefit when importers and exporters switch to the cheaper transit route, or exporters can avert monetary penalties connected with late delivery, or if lower inventory levels can be maintained, finer tuning of cargo-delivery schedules, the fewer the transit-transport difficulties, the greater the likelihood of gaining entry into overseas markets with its potential stimulus to other sectors of the economy, creation of a more stable domestic investments climate with reduced transit-transport difficulties for manufacturers depended on imported cargo or already exporting overseas, simplified procedures associates with a dry port and containerization mean fewer steps and fewer officials involved in processing the required documentation. with fewer control points, there is less scope for malpractice. If queries arise in regard to documentation, these can be readily sorted out at a dry port by all parties represented on the site and introduction of simplified work practices at the maritime port.

Different actors can benefit from the implementation of the Dry Port. The following table illustrates the advantages for different actors of the transport networks.

BENEFITS	Freight Forwarder	Shippers	Port Authority	Society	Road Operator	Rail Operators
Balance between road and rail transport				+		+
Shorter waiting time in port	+	+	+		+	
Reduced road congestion	+			+	+	
Prevention from increase in environment pollution				+		
Strengthening the sea ports role in transport chains		+	+			
Reducing the use of expensive areas in the port			+			
Creation of jobs				+		

Table 2. 1 The advantages that different actors can gain from the Dry ports.

Source: (Lina, 2009)

2.1.4. Logistics Activities

Logistics is the positioning of resource at the right time, in the right place, at the right cost, at the right quality. (Chartered Institute of Logistics and Transport (UK), 2012)

Logistics: is the function responsible for the flow of materials from suppliers into an organization, through operations within the organization, and then out to customers. Logistics is an important activity making extensive use of the human and material resources that affect a national economy. (Waters, 2003)

Logistics management is that part of supply chain management that plans, implements, and controls the efficient, effective forward and reverses 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. (CSCMP, 2012)

Logistics is comprised of five interdependent activities: *customer response, inventory planning and management, supply, transportation, warehousing*. (Frazelle, 2002)

2.1.4.1. Customer Response

Customer response links logistics externally to the customer base and internally to sales and marketing. Customer response is optimized when the customer service policy (CSP) yielding the lowest cost of lost sales, inventory carrying, and distribution is identified and executed. (Frazelle, 2002) The logistics of customer response includes activities of developing and maintaining a customer service policy, monitoring customer satisfaction, order entry, order processing, and invoicing and collections. Therefore, customer service goes with the way we respond to customer order to fulfill per the required quantity, quality and time. (Matiwos, 2015)

2.1.4.2. Inventory planning and management

The objective of inventory planning and management (IP&M) is to determine and maintain the lowest inventory levels possible that will meet the customer service policy requirements stipulated in the customer service policy. (Frazelle, 2002)Today, inventory investment is viewed as a supply chain cost driver rather than a material asset. Holding stock for inventory requires investment of large capital. Any decisions about stock have direct relation to support the business and logistics strategies. Logistics strategy focuses on low costs to make stock holdings as efficient as possible. Stocks have a clear strategic effect on an organization influencing long-term options. But the strategic effect on of stocks has a clear effect on the organization's profit, margins, return on assets, and other financial measures of performance, such as lead time, availability, and reliability (Waters, 2003)

2.1.4.3. Transportation

The logistics of transportation includes network design and optimization, shipment management, fleet and container management, carrier and freight management. (Matiwos, 2015) The objective of transportation is to link all pick-up and deliver-to points within the response time requirements of the customer service policy and the limitations of the transportation infrastructure at the lowest possible cost. (Frazelle, 2002)

2.1.4.4. Supply

Supply is the process of building inventory (through manufacturing and/or procurement) to the targets established in inventory planning. The objective of supply management is to minimize the total acquisition cost (TAC) while meeting the availability, response time, and quality requirements stipulated in the customer service policy and the inventory master plan. (Frazelle, 2002)

2.1.4.5. Warehousing

The logistics of warehousing includes receiving, put away, storage, order picking, and shipping. The objective of warehousing is to minimize the cost of labour, space, and equipment in the warehouse while meeting the cycle time and shipping accuracy requirements of the customer service policy and the storage capacity requirements of the inventory play. (Frazelle, 2002)

2.1.5. Performance Measurement

Performance measurement is the process of quantifying the effectiveness and efficiency of actions through a specialized set of indicators. The four key competencies that characterize logistics are positioning, integration, agility and measurement. Of these, measurement (organized into a coherent system) must provide to management the necessary and sufficient information's related to financial issues, internal processes of customers, innovation and improvement. To analyze the level of performance in logistics can be used Logistics Performance Index. (Florin *et al*., 2015)

Port performance assessment is an important issue for most ports. The increased 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 organization management and operation and it is also challenging issue measuring the performance of ports.(Notteboom and Rodrigue, 2005)

Many researchers (such as Bougheas *et al*, 1999; Limao and Venables, 2001; Francois and Manchin; 2006 and World Bank report 2013) suggest different reasons for the logistic performance inefficiency in developing countries. Some of these are poor government policies, cumbersome bureaucracy, poor infrastructure, institutional inefficiency and landlockedness. However, there is no argument on which one of these factors is the most influential causes for countries like Ethiopia.

Logistics is understood as a network of services that support the physical movement of goods, trade across borders, and commerce with in borders. It allows products to be moved to the end customer, satisfactorily and efficiently. It comprises an array of activities beyond transportation, including warehousing, brokerage, express delivery, terminal operations, and related data and information management. The international Logistics Performance Index (LPI) provides insights into the drivers of overall logistics performance. The LPI is best used as a snapshot of where a country stands on logistics, and it can serve as an entry point to a more comprehensive assessment of a country's logistics performance. Logistics performance is strongly correlated with the quality of service and it's more than income. (Jean *et al*., 2018)

The World Bank's Logistics Performance Index (LPI) 2018 ranks countries on six dimensions of trade:-

1. *Customs* : efficiency of customs and border management clearance
2. *Infrastructure* : quality of trade and transport infrastructure
3. *Ease of arranging shipments* : ease of arranging competitively priced shipments
4. *Quality of logistics services*: competence and quality of logistics services-trucking, forwarding, and customs brokerage.
5. *Tracking and tracing*: ability to track and trace consignments.

6. *Timeliness* : frequency with which shipments reach consignees within scheduled or expected delivery times

Logistics performance is based largely on reliable supply chains and predictable service delivery for traders. (Jean *et al*., 2018)

One of the key indicators of the success of dry ports is the extent to which they can contribute to the minimization of the total logistics cost between cargo origins/destinations and seaports, or in the case of domestic intermodal freight terminals, between ultimate cargo origins and destinations. Logistics costs are the costs (or charges) associated with the entire logistics chain, payable by cargo owners or shippers for

a) Local delivery b) Terminal handling and storage, c) Line hauls transport (i.e. transport between dry ports and seaports or between domestic intermodal freight terminals) and d) Other intermediate costs (such as those related to customs clearance) of these components, the level of terminal handling and storage costs will reflect the operational efficiency of terminals, but also the effectiveness of streamlining customs and other border control procedures in order to accelerate the turnaround of containers and cargo in terminals. (ESCAP, 2015).

2.1.6. Dry port performance indicators

Performance evaluation plays an important role in all areas of business management, both in private and public sectors, because it explains how much and how organizations have reached their goals besides providing subsidies about how they can promote improvements. Forslund (2007) defines the steps of performance management as follows: set objectives and strategies; define metrics; set targets; measure; analyze; evaluate; and then act to improve the process. The common purposes of performance management are to reduce cost and to improve efficiency and effectiveness. Fatimazahra B., Charif M., Alami S., (2015). *"If you cannot measure it, you cannot control it. If you cannot control it, you cannot manage it. If you cannot manage it, you cannot improve it" (Harrington, 1991)*

The efficiency of port operations has a direct impact on the efficiency of the entire logistics chain along domestic and international freight corridors-and hence on transport

costs. Efficient ports have shorter turn around (loading and unloading) times and lower handling costs. Port efficiency is an important determinant of transportation costs: doubling port efficiency reduces costs by as much as halving the distance between countries (Wilmsmeier, Hoffmann, and Sanchez 2006). Well-functioning logistics, both domestically and internationally, is a necessary precondition of national competitiveness (Arvis *et al*, 2014). To improve port performance and competitiveness, it is therefore necessary to have a better understanding of the various components of cargo delays in ports and address the underlying causes (Raballand *et al*., 2012).

International transport costs directly depend on port efficiency. Port efficiency is considered as the most important factor among other port characteristics, such as port infrastructure, private sector participation and inter-port connectivity (Wilmsmeier, Hoffmann, and Sanchez 2006)

The performance of ports and terminals is not a simple issue to address because there are several determinants that affect port performance such as worker-related issues, number and type of cargo handling equipment used, quality of port support areas, land access, customs efficiency and concessions (UNCTAD, 2015)

Performance indicators are very useful measures that quantify and simplify the critical success factors of a firm (Kaplan and Norton, 1992). Neely *et al*. (1997) argued that performance measures are a somewhat mechanistic view to represent a behavioral impact.

De Langen *et al* (2007) suggested the main functions of performance indicators (PIs) are as follows:

-PIs provide management for organization.

-PIs serve to compare (the organization and other units, such as countries).

-PIs are used to communicate with relevant stake holders.

To indicate the importance of the operations function to the business it is useful to identify five key performance indicators for any operations system. These are quality, speed, dependability, flexibility and cost, where:

1. *Quality* reflects the extent to which operations are performed in line with specifications and/or satisfy the customer (i.e. *getting things right*);
2. *Speed* reflects how quickly and responsively we supply and deliver our products and services (i.e. *doing things quickly*);
3. *Dependability* indicates our reliability to the customer or recipient of the product or service *(i.e. doing things consistently and on time):*
4. *Flexibility* reflects our ability to adapt and respond to differing needs *(i.e. being able to change what we do): and*
5. *Cost* reflects the expense we have incurred in a financial sense to deliver the product and/or service to the recipient (i.e. doing things cheaply).

In the simplistic sense, and in the 'ideal world', we might argue that an operation should seek to optimize all five of these performance objectives. (David B. and Paul L., 2010)

A country's logistics performance plays a vital role in facilitating transportation of goods to the international market. "Inefficient logistics services impeded trade by imposing an extra cost in terms of time as well as money" (Korinek and Sourdin, 2011)

The construction of the desired model implies the key domains selection for it which means highlight critical success factors that are essential to the port competitiveness particularly in the logistical performance. With this a careful selection of domains and indicators is necessary in order to the model can represent port reality in their multiple dimensions with relevance to the logistics performance the best possible. This model was based in part on the World Bank Logistics Performance Index (LPI) seeking to transpose their criteria into the port context. Five of six components were used as starting points in the choice of the domains to the designed model .these are Customs, Infrastructures, Ease of arranging shipments, Quality of logistics services, and Timeliness. (Vale, F. 2017).

Several indicators are just measurement indicators they are considered the same because they have influence in the port logistics performance. As per literature review the study use for port performance indicators as follow: - *Customs, Port Infrastructures, Ease of arranging shipments, Quality of logistics service, and Timeliness.*

2.1.6.1. Customs

The World Customs Organization (WCO) defines Customs as "the government service which is responsible for the administration of Customs law and the collection of import and export duties and taxes and which also has responsibility for the application of other laws and regulations relating, inter alia, to the importation, transit and exportation of goods." Customs operations involve the administration of customs law relating to the importation, exportation, movement or storage of goods and the collection of duties and taxes. In this regard, customs operations are a key factor for trade facilitation and economic development of a country. The customs clearance component of the LPI measures the efficiency and effectiveness of customs dispatch procedures in terms of speed, simplicity and predictability. Improvements in customs clearance performance are tied to overall trade policy environment. (International Transport Forum 2015)

2.1.6.2. Port Infrastructure

In context of port operations, infrastructure consists of hardware and software. Hardware infrastructure includes land for road and rail modes, and the layout for entry and exit of cargoes. Software infrastructure refers to port operating systems. To support the improvement of port operations, powerful infrastructure represented by information systems to link with other players is required. (Cheng, 2010)

2.1.6.3. Ease of arranging shipments

The dry port providing all value added service on ease of arranging competitively priced shipments. It is important to identify the exact location and the route of each consignment up to its delivery to the end customer. Traceability is a product of the logistics sector as a whole, since all parties in the supply chain contribute to this component. Improved traceability creates more reliable distribution channel processes, provides a better risk management system and helps improve international and external business. (International Transport Forum 2015)

2.1.6.4. Timeliness

The frequency with shipments reaches consignees within the scheduled delivery time. (Jean *et al,* 2018). The shipper went to know the status of their cargo and reliable port service on time. Timeliness of the shipments mainly is an indicator of supply chain reliability. A long lead time is not necessarily a problem if delivery is predictable and demand is stable. However, if there is uncertainty about future demand, long lead time is costly. Frequency with shipments reaches the consignee within the scheduled or expected time. (International Transport Forum, 2015). The time to complete trade transactions is useful outcome measure of logistics performance. (Jean *et al*., 2018). By minimizing the time that containers are in port, a port is able to handle more containers and thus increase its container throughput. (Wayne K., 2009)

Merckx (2005) defines the container 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 Monde A., Yang J., and Stephen O., (2018) Average dwell time is a 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. Operational dwell time is the time to unload vessels 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. The single most important factor, according to recent studies on dwell time in sub-Saharan African ports, is the use of the port as storage warehouse by importers or their agents.

2.1.6.5. Logistics service quality

The result received comparing customers' expectations with customers' perception of service quality. Clients, prior to ordering the service, already have expectations of what the service provider should offer them. Therefore the quality of logistical service perceived by the client is the difference between the perceived service and expectation (Campos & No'brega, 2009). It is very vital to note here that, service quality is not only assessed as the end results but also on how it is delivered during service process and its

ultimate effect on consumer's perceptions (Douglas & Connor, 2003). The demand for fast delivery, as well as supply chain predictability and reliability are strong incentives for shippers and logistics providers to improve the speed and quality of their services. (Kirstein, 2018). Quality logistics services play an important role in facilitating the transportation of international trade in goods: inefficient logistics services impede trade by imposing an extra cost in terms of time as well as money.

2.2. Empirical Literature Review

The World Bank study of logistics sector (LPI) (2018) for the period 2012-2018, place Ethiopia on 131th out of 167 participating countries in 2008. It was indicate the poorest performance on the overall logistics performance.

Rakant (2011) describes dry port as critical nodes in global supply chains. In the study evaluate the performance of dry port, measured by identify key factors to successes. His findings suggest that key elements affecting the performance of dry ports measured in number of TEUs handled annually are tariff, number of employees and container handling equipment while the other factors such as size of the dry port, service quality etc. do not have a significant impact on the performance. One of the objectives of this behaviour of the service providers is to increase reliability of commitment towards the shipper/consignees.

The UN Review of Maritime Transport (2019) study explain Performance indicators are important analytical tools that can facilitate an understanding of the nature and scale of issues facing the shipping industry and ports, and help assess the potential impact of alternative policy options. Indicators are also necessary for self-evaluation and benchmarking, two factors that are integral to policymaking, as they help assess progress towards set goals and targets. Bearing in mind the strategic and practical usefulness of performance indicators, indicators with multidimensional metrics spanning a range of factors, such as efficiency, cost-effectiveness, productivity, profitability, connectivity, access, social inclusiveness and environmental sustainability, are increasingly considered necessary for maritime business and its users, as well as for Governments and

policymakers. Performance monitoring, measurement, reporting and evaluation are attracting more and more attention and interest.

Jie (2006) describes port logistics is a special product of logistics, and has an important position at the whole logistics service chain. Port logistics has been being an important step in the development chain of modern logistics. Port is an engaging in discharging, storage, and processing place. Port logistics has become a motivate of developing a port and the growth of cities' foreign trade and economy, especially having higher level economic export-oriented port cities which are importance place for import and export and highly connect with global economy.

Abdurezak (2016) his study described some dry port performance determinates. He focuses on the following dry port determinant's Cargo handling equipment, port infrastructure, customs operation, and size of dry port, quality of logistics service, port staff and reliability of port operations. The study assesses Modjo dry port user customer's perceived on performance determinates. The study use survey research design and analyze by descriptive statistics. The study result show customs operations, cargo handling equipment, and port infrastructure get highest scores. However, quality of logistics services and reliability of port operations are scored lower.

Munters (2019) study focus lies on evaluation of the alternatives by carefully integrating the interests of stakeholders in the process, to achieve the three layers of sustainable Dry port development: social, environmental and economy. The goal of the research is to determine the most sustainable expansion direction for MDP in Ethiopia. This study proposes a framework to evaluate dry port expansion and development in Ethiopia, and possibly in a wider African context. The study also describe operational efficiency should improve to decrease the current dwell time of 50 to 60 days. In his study indicate two reasons for high dwell time these are i) Processes at the dry port take a long time in general, and for regular containers the dwell time is already up to 23 days on average.

ii)Importers “store” their containers at MDP as storage is expensive in the capital of Ethiopia.

Girma (2016) study describes and focused on the analysis of existing measures of port performance and efficiency, the association of ports with logistics and supply chain management, and appropriate measures of logistics and supply chain management efficiency in general and humanitarian operations and its effect in particular. The variable uses for study was port service availability, port service cost, port service demand, and port service satisfaction level.

Blessing (2014) in his study Unlocking the landlocked describes challenges for LLDCs when implementing dry ports. Firstly, the dry port might increase transport costs in the logistics chain if charges are too high or institutional barriers are not revised, resulting in operational inefficiencies. Inefficiencies eventually decrease the total throughput, leading to dry port failure. LLDCs must minimize both physical and non-physical barriers to trade. If not, the dry port may fail to attract customers and promote the modal shift of cargo from road to rail. Therefore, the quality of institutions is import for dry port success. Poor infrastructure and logistics at dry ports will eventually result in long lead times in the supply chain.

Therefore, dry port logistics activities and performance indicators are different and more complex they related with port logistics performance. The measure of the port logistics performance is great challenges for ports. Thus the measurement of dry port logistics performance was important for the port and the country economy at all.

2.3. Conceptual Framework

The country logistics performance is poor and low level, it's affected by many factors one of the bottleneck is dry ports logistics performance in landlocked country like Ethiopia. Different methods for measurement of logistics performance of dry port has been proposed and recognized in previous literatures. It is difficult to find and use one single dimension of dry port logistics performance, there is no one general measurement or model to measure container port/ terminal performance. The study measure some logistics activities on the dry port logistics performance these are Customer response, Inventory planning and management, Transportation, Warehousing, and performance indicators namely Customs, Port Infrastructures, Quality of logistics service, and Timeliness. Hence, the conceptual framework of the study can be show as the following figure.

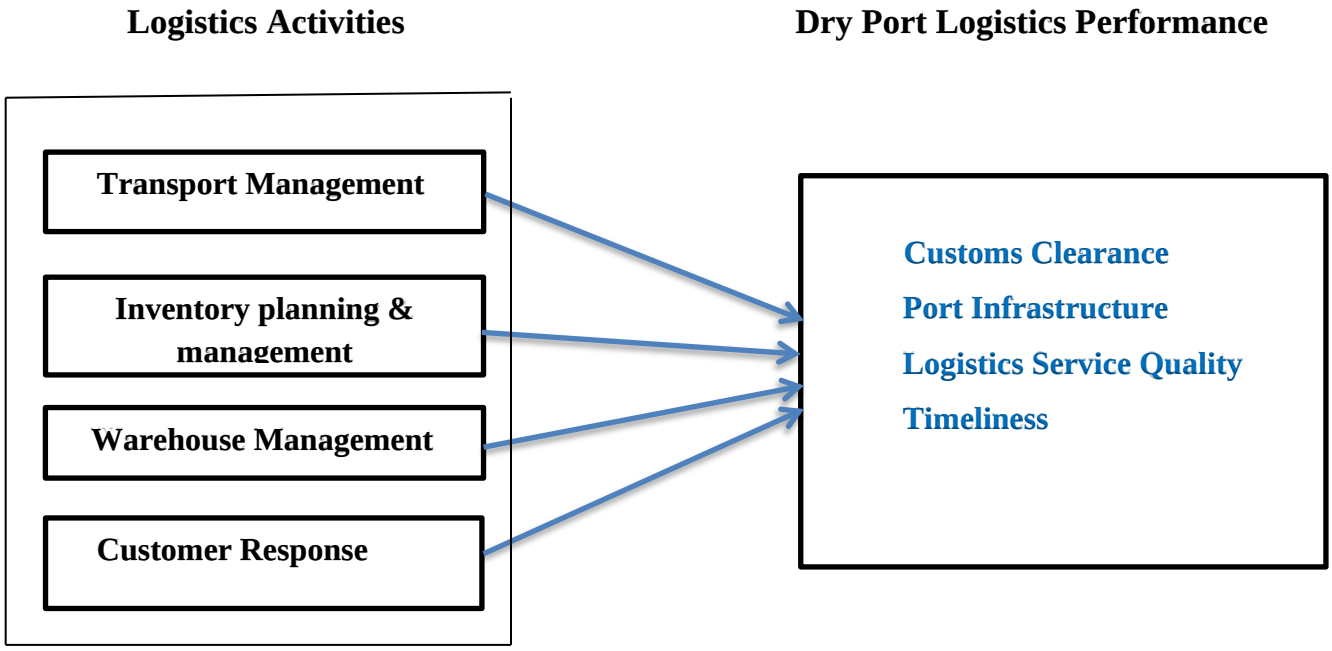

Figure 2. 3 Conceptual Frame work of study (Developed)

CHAPTER THREE

RESEARCH METHODOLOGY

3.0. Introduction

This chapter presents the research approach, methods and design being used by the study. Mainly deals with the whole issue of the research framework, including research strategy and design, sample size, research methods, data collection and analysis techniques.

3.1. Description of Study Area

This study was conducted on Modjo dry port and terminal. MDP is under Ethiopian Shipping and Logistics Service Enterprise (ESLSE). The Modjo dry port and terminal is one of the first and largest inland dry ports in Ethiopia, which was established in 2009. It is located roughly 80km south of Addis Ababa, the capital, and close to the largest consumers, producers, importers and exporters (World Bank, 2017a).

3.2. Research Approach

The research used a mixed research involving both qualitative and quantitative approaches. A mixed methods study refers to the collection or analysis of both quantities and /or qualitative data in a single study. (Creswell *et al*., 2003). In other words, what we generally consider qualitative data- "words, pictures, and narrative"-can be combined with quantitative, numerical data from a larger-scale study on the same issue, allowing our research results to be generalized for future studies and examinations.(Sharlene N.Hesse-Biber 2010). These approaches are appropriate when your purpose is to describe, explain, or evaluate, and are particularly useful for studying complex problems or issues. (Patricla, 2017)

Qualitative research involves studies that do not attempt to quantify their results through statistical summary or analysis. Qualitative studies typically involve interviews, and observations without formal measurement. The main focus in qualitative research is to

understand, explain, explore, discover and clarify situations, feelings, perceptions, attitudes, values, beliefs and experiences of a group of people. (Ranjit 2011)

Quantitative research involves studies that make use of statistical analyses to obtain their findings. Key features include formal and systematic measurement and the use of statistics. (Geoffrey Marczyk, David DeMatteo, and David Festinger 2005)

Quantitative Research approach is used to quantify the respondent's assessment of Modjo dry port logistics performance by generating numerical data or data that can be transformed into useable statistics. Qualitative research is used to gain an understanding of staffs and manager's experience, opinions, and perceptions by use of unstructured or semi-structured data collection techniques i.e. open ended questionnaires, interview, and the enterprises report. The integration of both qualitative and quantitative researches provided a more complete and comprehensive understanding of the key account management practice and it offset the weaknesses inherent to using each approach by itself. (Geoffrey M., David D., and David F., 2005). Mixed methods research may result in a comprehensive understanding of the phenomenon under investigation because of the integration of quantitative and qualitative data. Mixed methods research is generally appropriate when your purpose is to describe, explain, or evaluate. (Patricia 2017)

The study was followed inferential statistics for quantitative approach and descriptive statics for qualitative approach. So, the study uses both qualitative and quantitative research approach.

3.3. Research Design

Designing a study helps the researcher to plan and implement the study in a way that will help the researcher to obtain intended results, thus increasing the chances of obtaining information that could be associated with the real situation (Burns & Grove 2001)

Based on the purpose of research, scientific research is classified into three types: exploratory, descriptive and explanatory .This study is used descriptive and explanatory to

assess the dry port logistics performance of Mojo dry port. The research is intended to describe the impact of dry port logistics performance on country.

Descriptive research is used to assess the dry port logistics performance of Modjo dry port, the demographic and background information of the respondents and the overall questioners. Descriptive used to assess how dry port logistics performance of MDP by each determinate and logistics activities. The research purpose was to assess the logistics performance determinate of dry port and hence the researcher use descriptive research, whereas explanatory study to examine the relationships between variables. According to Kothari, (2004), those two research designs may facilitate research to be as efficient as possible yielding maximum information. On the other hand, explanatory research designs, emphasis on studies of the discovery of ideas and insights

3.4. Population and Sampling

The study was conducted on Modjo dry port. According to Patricia (2017), "the study population is the group of elements from which you actually draw your sample". The target populations of the research are those workers in Modjo dry port directly involved to study on the dry port logistics performance. The Modjo dry port workers randomly selected. The HR data of Modjo dry port and terminal indicates that the total dry port worker number of Modjo dry Port and terminal is 475.

3.4.1 Sample Design

To select the needed number of individuals from workers simple random sampling used. In simple random sampling each member of population is equally likely to be chosen as part of the sample.This technique permits the research to have complete freedom of selecting equally likely to be chosen as part of the sample individual that can provide data. The researcher took a sample of 83 Modjo dry port workers with simple random sampling method. Simple random sampling , also referred to as a probability sampling technique where the researcher selects units to be sampled the study is gathered in a process that does give all of the individuals in the population equal chance of being selected and included.

3.4.2 Sample Size

Sampling is the process by which you select a number of individual cases from a large population. Sampling addresses the questions "*Who* or *what* is in your study? Where are you getting your data or content?" typically, discussions of sampling centre around .*who* is in your study- the subjects, respondents, participants, or collaborators; however, in studies that involve the use of non-living data (e.g. contain analysis of text or images), it's a question of what is in your study. Therefore, a sample is the number of individual cases that you ultimately draw and from which/whom you generate data. (Patricia, 2017)

To determine the sample size from the number of people working at MDP used simple formula to include in the survey. The employees are considered to be homogenous in their nature and also influenced by the operation of the system. To calculate the sample size use developed by Mugenda and Mugenda, (2003) Based on this formula confidence level is 90% and level of precision is 10%, 10% margin of error was used due to the homogeneity of the population. Where e^2 is the marginal error

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

n - The sample size
N - The population size
e - The acceptable sampling error

Using this formula $n = \frac{475}{1+475(0.1*0.1)} = \mathbf{83}$

Therefore, based on the above formula the sample size is determined by 83 respondents.

3.5 Data Collection

Gathering data is an important part in the research. There are several different ways to gather information, however in this study the main sources have been through questionnaires, and secondary source (See Appendix I). There are two major approaches to gathering information about a situation, person, problem or phenomenon. When you undertake a research study, in most situations, you need to collect the required information;

however, sometimes the information required is already available and need only be extracted. (Ranjit, 2011)

To achieve this, the relevant data has been obtained through two main approaches:

i) **Primary data** is the data that will be collect mainly from workers of Modjo dry port. Other information from informal discussion and interview held with practitioners in the sector and expert opinion. To collect primary data (from primary sources) the study is going to use Questionnaire.

ii) **Secondary data** is the data that will be gathering from written materials of enterprise documents and reports and other like –books, other researcher, and internets. To get secondary data, different documents from concerned bodies of the enterprise will be referred and in addition other secondary source like books, internets and other research will be used.

3.6 Data Analysis

After collecting the data through questionnaires, the researcher has organized and prepared the various data depending on the sources of information. Moreover, in order to ensure consistency of data, editing was carried out by the researcher. Once editing has done, data were analyzed qualitatively and quantitatively. The quantitative data analysis was done by the use of SPSS (Version 20) software packages and EXCEL. For the analysis of the primary data, two statistical techniques were employed. These are descriptive and inferential statistical analysis techniques.

It will be further described by using tabulation, percentage and figures so that finding will be easy to be understood by everyone. And inferential stastics analysis by Spearman's correlation was used to show the relationships between independent variable on dependent variable.

Finally the outcome of the project will be presented on written material and detailed oral presentation

3.7 Scale Reliability

Reliability and validity are important factors when performing a research. Reliability aim to secure that the measuring instrument should not generate any random errors. Reliability refers to the quality of a measurement procedure that provides repeatability and accuracy. (Ranjit, 2011). According to Zikmud et al (2010) Cronbach's alpha is a measure for the internal consistency of items to the concept. Scales with coefficient alpha between 0.8 and 0.95 are considered to have very good reliability, scales with coefficient alpha between 0.7 and 0.8 are considered to have good reliability and coefficient alpha between 0.6 and 0.7 indicates fair reliability.

No.	Variables	No of items	Cronbach's Alpha
1	**Logistics Activities**	**20**	**.954**
1.1	Transport Management	5	.862
1.2	Inventory Planning & Management	5	.924
1.3	Warehouse Management	5	.865
1.4	Customer Response	5	.915
2	**Performance Indicators**	**20**	**.897**
2.1	Customs Clearance	5	.794
2.2	Port Infrastructure	5	.828
2.3	Logistics Service Quality	5	.801
2.4	Timeliness	5	.739

Table3 1. Cronbach's Alpha Reliability Test

Source: Survey 2020

From the above table all variables are reliable as the alpha is greater than 0.7. Thus it shows internal consistency of research instrument are very good reliable.

3.8 Validity

The validity is the measuring instrument should not generate systematic errors. According to Malhotra (2010), there are three types of validity in a study: content validity, predictive validity, and construct validity. This study addressed content validity through the review of literature and adapting instruments used in previous research.

3.9 Ethical Considerations

Ethical issues consideration on study was necessary for the purpose of ensuring the privacy as well as the safety of the respondent.

Since the researcher used the data from port workers which were collected through by questionnaire from Modjo dry port. The confidentiality of the participants was also ensured by not disclosing their names or personal information in the research question. Only relevant details that helped in answering the research questions were included.

Hence, this study fully considers the ethical matters of all the individuals involved in the study.

CHAPTER FOUR

RESULTS, DISCUSSION AND INTERPRETATIONS

4.1 Introduction

This chapter deal with data presentation, analysis, and interpretation of data obtained through survey questionnaire and secondary source of data together. To collect primary data 83 questionnaires were distributed for employee of the Modjo dry port as sample size. Out of total 83 questioners 75 respondents were returned and participate, however 3 rejected as a result of missing data and 5 not returned questioner. The result of the response rate was presented as 90 percent of respondents were returned the questionnaire filling properly. Therefore, the result obtained from the response rate implies the rate is a best representative of the sample size, and analysed using statistical software SPSS (Version 20) and EXCEL.

4.2 Demographic Profile of respondent

The study analyzed the background information of the respondents by using the following parameters: gender, age, education background, position in the organization, and work experience held by the respondents. Demographic data of respondents are presented and analyzed as show in the following tables.

Based on the following table 4.1 out of the total 75 respondents 48 (64%) of them were males while the rest 27 (36%) of them were females. As far as respondents' age is concerned, the distribution of frequency and percentage shows that, 4 (5.3%) of respondents found between the age groups of 18-25 years, about 60 (80%) of them found between the age groups of 26-35, about 8 (10.7%) of them found between the age groups of 36-46, about 2 (2.7%) of them found between the age groups of 47-55, the rest 1 (1.3%) were above 55 years. According the age distribution of the respondent's majority of them found at young and youth age group.

Variable	Category	Frequency	Percent
Gender	Male	48	64%
	Female	27	36%
Age	18-25	4	5.3%
	26-35	60	80%
	36-46	8	10.7%
	47-55	2	2.7%
	>=56	1	1.3%
Education Background	Diploma	2	2.7%
	First Degree	64	85.3%
	Second Degree	9	12%
Position in Organization	Senior Manager	6	8%
	Middle level Manager	21	28%
	Lower level	36	48%
	Other	12	16%
Work experience	1-5 year	39	52%
	6-10 years	31	41.3%
	11-15 years	5	6.7%
	Total	**75**	**100%**

Table 4. 1 Demographic data of respondents

Source: Research data, 2020

As per as table 4.1 concerning the educational level of the respondents the data show that, 64(85.3%) and 9 (12%) of respondents found education level of First Degree and Second Degree holders respectively. The rest 2(2.7%) was Diploma holder. According to the data level of education in Modjo Dry port dominated by First Degree holders, followed by Second Degree and Diploma holder respectively.

Concerning the position and status of the respondents the result indicate that 6 (8%) of the respondents were Senior Manager, 21 (28%) of the respondents were Middle Level

Manager, 36 (48%) of the respondents were Lower Level and 12 (16%) of the respondents indicated that other in junior position. The results indicate that the respondents were from different position and status of organization however most respondents were lower level.

With related to the employee work experience in organization 39 (52%) of them were found between 1-5 year, on the other hand 31 (41.3%) of respondent between 6-10 years and the rest 5 (6.7%) were above 10 years of work experience. As the data indicated majority of the respondents were found between 1-5 year experiences. With regards to the organization work experience condition, it can be show that most of the employee is well experienced.

4.3 Descriptive analyses the logistics activates of MDP

In this part of the study as it were revealed in the objectives articulated under section 1.5 to describe the respondent views on Modjo dry port logistics activities performance.

Accordingly, primary data were collected about the logistics performance of Modjo dry port under four major dry port logistics activities performance categories namely i) transport management, ii)inventory planning and management, iii)warehouse management and customer response

Considering the existing experiences with the port as a stakeholder, respondents were asked to indicate the extent of their agreement about dry port logistics activities from the alternative questions arranged in five point Likert scale method to measure logistics performance of MDP.

Based on this, respondents were personal evaluation the logistics activities performance of MDP using five point Likert scale responses namely; 1= strongly disagree, 2=disagree,3= neutral, 4=agree and 5=strongly agree. All respondents were workers from MDP directly engaged in dry port operation.

4.3.1 Transport Management in Modjo Dry port

The transport management of MDP evaluate in terms of fast delivery service, assurance of performance, efficiency, profitability and warehouse utilization of the port. The result as presented the following table.

Question Item	Frequency		Percent	Total	Mean	Std.Dev
Transport management has a role in achieving faster delivery service	Strongly Disagree	4	5.3	100%	3.95	1.089
	Disagree	5	6.7			
	Neutral	7	9.3			
	Agree	34	45.3			
	Strongly Agree	25	33.3			
Transport management ensure the port logistics performance	Strongly Disagree	2	2.7	100%	3.97	1.065
	Disagree	9	12			
	Neutral	4	5.3			
	Agree	34	45.3			
	Strongly Agree	26	34.7			
Transport management has a role in achieving efficiency in port operation	Strongly Disagree	2	2.7	100%	4.12	.958
	Disagree	2	2.7			
	Neutral	12	16			
	Agree	28	37.3			
	Strongly Agree	31	41.3			
Transport has a position in maximizing a profit of MDP	Strongly Disagree	1	1.3	100%	3.88	.900
	Disagree	6	8			
	Neutral	11	14.7			
	Agree	40	53.3			
	Strongly Agree	17	22.7			
Transportation management sometimes used as storage to utilizing warehouse cost	Strongly Disagree	3	4	100%	3.35	1.109
	Disagree	17	22.7			
	Neutral	17	22.7			
	Agree	27	3.6			
	Strongly Agree	11	14.7			
			Mean of Mean		**3.85**	

Table 4. 2 Analyses of transport management

Source: Own Survey, 2020

Given the information in Table 4.2 for the first question on transport management logistics activity has a role in achieving fast delivery service, 5.3 percent strongly disagree, 6.7 percent disagree, 9.3 percent neutral, 45.3 percent agree and the rest 33.3 percent strongly agree with a mean score 3.95. According to these responses, 45.3 percent of Modjo dry port employees were agree with role of transport management for achieving fast delivery services at Modjo dry port. Transport management plays a major role for fast and quick response for port user customers (importer, exporter, freight forwarder, and transporter)

The second question was asked to confirm transport management ensure the port logistics performance, 2.7 % strongly disagree, 12 % disagree, 5.3% neutral, 45.3% agree and 34.7% strongly agree with mean score 3.97 based on this result the largest proportion of response was agree and indicate that transport management ensure the port logistics performance of Modjo dry port.

The third question was asked transport management role in achieving efficiency in port operation, 27% strongly disagree, 27% disagree, 16% neutral, 37.3% agree and 41.3% strongly agree with a mean score 4.12 based on this result the largest number of response was strongly agree and indicate that transport managing play a major role for achieving efficiency in port operation .

The fourth question was transport management position for maximizing a profit of Modjo dry port, 53.3 % agree with mean score 3.88 the result show that to maximizing the profitability of the port transport management impact its performance. The last question was raised on transport management use as storage to utilization warehouse cost , most of respondent response 36% agree with a mean score 3.35 based on this result logistics of transport management is important to utilizing warehouse cost and container management of the port.

4.3.2 Inventory Planning and Management in MDP

The other important logistics activity of dry port logistics performance is inventory planning and management. Analysis of inventory planning and management was show in the following table.

Question Item	Frequency		Percent	Total	Mean	Std.Dev
Inventory management contributes for prompt service to customer.	Strongly Disagree	6	8	100%	3.72	1.157
	Disagree	4	5.3			
	Neutral	15	20			
	Agree	30	40			
	Strongly Agree	20	26.7			
Proper inventory management improves customer service	Strongly Disagree	1	1.3	100%	3.91	1.080
	Disagree	11	14.7			
	Neutral	8	110.7			
	Agree	29	38.7			
	Strongly Agree	26	34.7			
Inventory management has a significant role on port performance	Strongly Disagree	4	5.3	100%	3.91	1.117
	Disagree	6	8			
	Neutral	8	10.7			
	Agree	32	42.7			
	Strongly Agree	25	33.3			
Proper management of inventory contributes for profitability of dry port	Strongly Disagree	2	2.7	100%	3.97	0.972
	Disagree	5	6.7			
	Neutral	9	12			
	Agree	36	48			
	Strongly Agree	23	30.7			
Inventory management has a significantly enhance customer service	Strongly Disagree	-	-	100%	3.87	0.963
	Disagree	8	10.7			
	Neutral	16	21.3			
	Agree	29	38.7			
	Strongly Agree	22	29.3			
				Mean of Mean	**3.86**	

Table 4. 3 Analysis of inventory planning and management

Source: Own Survey, 2020

Given the information in the above table 4.3, the result on the first question was about inventory management contribution for prompt and quick service to customers, 8% strongly disagree, 5.3% disagree, 20% neutral, 40% agree and the rest 26.7% strongly agree with a mean score 3.72 . According to this response, 40% of Modjo dry port employees were agree with inventory management logistics activity of MDP contributes for prompt customer service. Customer service for all organization is important and affected in today competitive market. Because the port and terminal survival is determine by customers and other stakeholders.

The second question was asked to confirmation the proper inventory management improve customer service, 1.3% strongly disagree, 14.7% disagree, 10.7% neutral, 38.7% agree and the reaming 34.7% strongly agree with mean score 3.91 based on this result the largest proportion of response was agree and indicate that proper inventory management improve customer services.

The third question was asked significate role of inventory management on port logistics performance, 5.3% strongly disagree, 8% disagree, 10.7% neutral, 42.7% agree and 33.3% strongly agree with mean score 3.91 based on this result the largest proportion of response was agree and it indicate that for Modjo dry port performance inventory management play a significate role .

The fourth questions was asked proper inventory management contribute profitability of port, 2.7% strongly disagree, 6.7% disagree, 12% neutral, 48% agree and 30.7% strongly agree with mean score 3.91 based on this result the largest proportion of respondent was agree and it indicate that proper inventory planning and management high contribution for profitability of the port . The performance of port was measure in terms of financially and operationally. Thus inventory planning and management highly affected the performance of dry port.

The last question inventory management significantly enhances customer service of the port,10.7% strongly disagree, 21.3% disagree, 38.7% neutral, and 29.3% agree with

mean score 3.87 based on this result the largest proportion of respondent was neutral and it indicate that inventory management not significantly enhance customer service .

4.3.3 Warehouse Management in Modjo Dry port

According to Frazelle (2002) the warehouse management is important to minimize the cost of labour, space, and equipment in the warehouse. The analysis of warehouse management was show in the following table

Question Item	Frequency		Percent	Total	Mean	Std.Dev
Warehouse has an effect on reducing operational cost of dry port.	Strongly Disagree	10	13.3	100%	3.51	1.245
	Disagree	5	6.7			
	Neutral	10	13.3			
	Agree	37	49.3			
	Strongly Agree	13	17.3			
Warehouse management plays a major role in customer satisfaction.	Strongly Disagree	6	8	100%	3.89	1.158
	Disagree	1	1.3			
	Neutral	15	20			
	Agree	26	34.7			
	Strongly Agree	27	36			
Proper identification of all storage location	Strongly Disagree	5	6.7	100%	3.45	1.200
	Disagree	13	17.3			
	Neutral	16	21.3			
	Agree	25	33.3			
	Strongly Agree	16	21.3			
Storing goods according to recommended guidelines	Strongly Disagree	4	5.3	100%	3.52	1.107
	Disagree	10	13.3			
	Neutral	18	24			
	Agree	29	38.7			
	Strongly Agree	14	18.7			
Storage space optimization	Strongly Disagree	4	5.3	100%	3.55	1.069
	Disagree	8	10.7			
	Neutral	19	25.3			
	Agree	31	41.3			
	Strongly Agree	13	17.3			
			Mean of Mean		**3.58**	

Table 4. 4 Analysis of warehouse management

Source: Own Survey, 2020

As seen the above table 4.4, the result on the first question warehouse has effect on reducing operational cost of dry port, 13.3% strongly disagree, 6.7% disagree, 13.3% neutral, 49.3% agree and the remaining 17.3% strongly agree with mean score 3.51 based on this result the largest proportion of respondent was agree and it indicate that warehousing has play great for reducing operational cost of dry port.

The second question was asked warehouse management play major role for customer satisfaction, 8% strongly disagree, 1.3% disagree, 20% neutral, 34.7% agree and 36% strongly agree with mean score 3.89 based on this result the largest proportion of respondent was strongly agree and it indicate that warehousing is play a major role for customer satisfaction at Modjo dry port.

The third question was asked at Modjo dry port applies and uses proper identification of all storage location, 6.7% strongly disagree, 17.3% disagree, 21.3% neutral, 33.3% agree and 21.3% strongly agree with mean score 3.45 based on this result the largest proportion of respondent was agree and it indicate that Modjo dry port apply proper identification of all storage location.

The last question was raised to storage space optimization practice, 5.3% strongly disagree, 10.7% disagree, 25.3% neutral, 41.3% agree and 17.3% strongly agree with mean score 3.55 based on this result the largest proportion of respondent was agree and it indicate that Modjo dry port warehouse management logistics practice optimizing storage space utilization.

Photograph 1: Warehouse and Container terminal at MDP

Source: Field Survey, 2020

4.3.4 Customer Response practice at Modjo dry port

The analysis of the study on customer response of Modjo dry port was show the following table.

Question Item	Frequency		Percent	Total	Mean	Std.Dev
Responding quickly to the customers' needs	Strongly Disagree	8	10.7	100%	3.37	1.194
	Disagree	9	12			
	Neutral	16	21			
	Agree	31	41.3			
	Strongly Agree	11	14.7			
Fulfilling customers' orders in the promised date	Strongly Disagree	6	8	100%	3.31	1.197
	Disagree	13	17.3			
	Neutral	22	29.3			
	Agree	20	26.7			
	Strongly Agree	14	18.7			
Sharing information with customers when required	Strongly Disagree	3	4	100%	3.71	1.010
	Disagree	7	9.3			
	Neutral	13	17.3			
	Agree	38	50.7			
	Strongly Agree	14	18.7			
Measuring and evaluating customer satisfaction level.	Strongly Disagree	4	5.3	100%	3.35	1.121
	Disagree	15	20			
	Neutral	18	24			
	Agree	27	36			
	Strongly Agree	11	14.7			
Accepting the customer comments	Strongly Disagree	3	4	100%	3.67	1.004
	Disagree	7	9.3			
	Neutral	15	20			
	Agree	37	49.3			
	Strongly Agree	13	17.3			
				Mean of Mean	**3.48**	

Table 4. 5 Respondents' rate on customer response

Source: Own Survey, 2020

The respondents were request to rate customer response practice of Modjo dry port. From the table 4.5 above the question was raised concerned where quickly responding (41.3% agree) with mean 3.37, fulfilling order no time (29.3% neutral)with mean 3.31, information sharing (50.7% agree) with mean 3.71, evaluating customer satisfaction (36% agree) with mean 3.35 and accepting customer comments (49.3% agree) with mean 3.67. Based on this result the largest proportion of respondent was agree on customer response and it indicate that Modjo dry port customer response logistics practice good however fulfilling customer order on the promise's date must be improve and to satisfy customer of dry port. Based on this result the largest proportion of respondent agree on customer responsive of the port on quickly response n customer need, information sharing and accepting comment however problem of fulfilling customers' orders on promise date it need improvement and its affect the performance of the port.

4.4 Logistics Performance of MDP

4.4.1 Customs Clearance at MDP

The customs clearance component of the LPI measures the efficiency and effectiveness of customs dispatch procedures in terms of speed, simplicity and predictability. Improvements in customs clearance performance are tied to overall trade policy environment. (International Transport Forum, 2015). The customs clearance analysis of the MDP was shown the following table.

Question Item	Frequency		Percent	Total	Mean	Std.Dev
The speed of customs clearance & procedure	Very Low	2	2.7			
	Low	5	6.7			
	Average	36	48			
	High	31	41.3			
	Very High	1	1.3	100%	3.32	.738
The customs operation simplicity and predictability	Very Low	1	1.3			
	Low	8	10.7			
	Average	25	33.3			
	High	38	50.7	100%	3.45	.793
	Very High	3	4			
Efficiency of customs service	Very Low	1	1.3			
	Low	4	5.3			
	Average	37	49.3			
	High	27	36	100%	3.44	.775
	Very High	6	8			
The time to obtain a gate out authorization with physical inspection	Very Low	3	4			
	Low	16	21.3			
	Average	24	32			
	High	31	41.3	100%	3.15	.911
	Very High	1	1.3			
The time to obtain a gate out authorization without physical inspection	Very Low	4	5.3			
	Low	18	24			
	Average	24	32	100%	3.08	.983
	High	26	34.7			
	Very High	3	4			
				Mean of Mean	3.28	

Table 4. 6 Respondent rate on customs clearance

Source: Own Survey, 2020

To evaluate performance extent of Modjo dry port by using performance indicator analysis as follow, according to respondent result show on table 4.6 customs clearance speed and procedure (48% average) with mean score 3.32, simplicity and predictability (50.7% high) with mean score 3.45, efficiency (49.3% average) with mean score 3.44, time to obtain gate out with physical inspection (41.3% high) with mean score 3.15 and time to obtain gate out without physical inspection (34.7% high) with mean score 3.08 in

MDP. Based on this result customs clearance operation at Modjo dry port impact on logistics performance in two questions better performance other two questions performance average it need improvement the remaining one question also need improvement time to obtain gate out with physical inspection takes high time .

4.4.2 Port Infrastructure at MDP

Port infrastructure is significant impact on dry port logistics performance. To support the improvement of port operations, powerful infrastructure represented by information systems to link with other players is required. (Cheng, 2010)

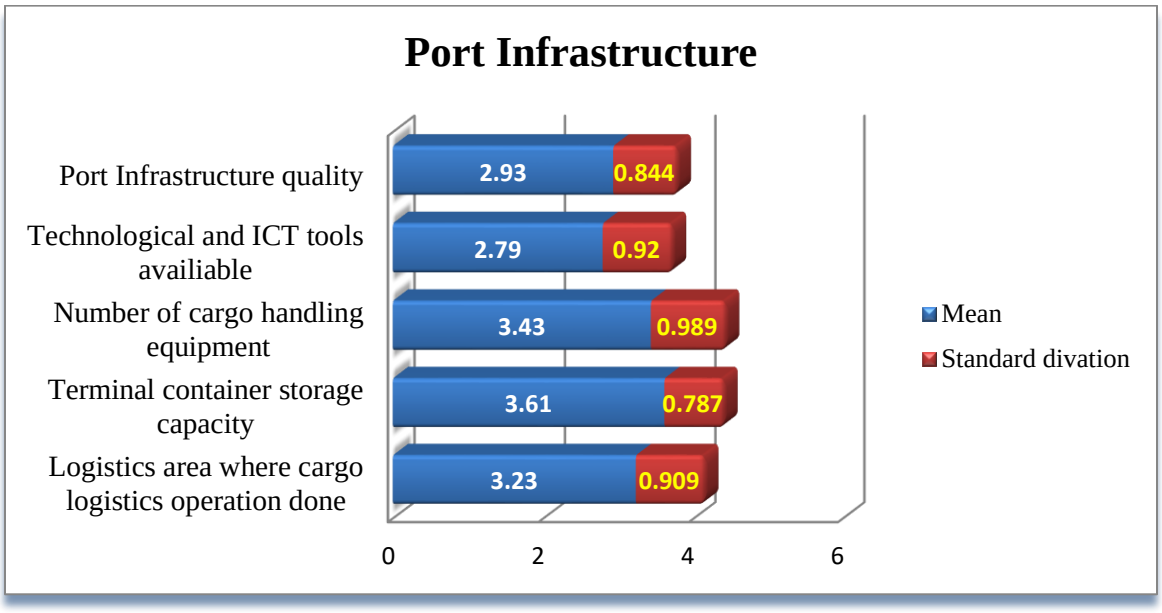

Figure 4. 1 Respondents views on port infrastructure performance

Source: Own Survey, 2020

As observed from the above figure 4.1 port logistics area significance level for logistics performance of dry port was whether or not affect logistics performance as according to respondent and the result was mean value of the respondents were 3.61 terminal container storage capacity highly affected logistics performance . However, response for the port infrastructure quality, logistics area where cargo operation done, number of cargo handling equipment and port infrastructure quality averagely affected the port

performance and the mean value was 2.93, 3.23, 3.43, 2.93 respectively and mean of mean value was 3.20. The grand mean result show that port infrastructure average.

4.4.3 Logistics Service Quality at MDP

It is very vital to note here that, service quality is not only assessed as the end results but also on how it is delivered during service process and its ultimate effect on consumer's perceptions (Douglas & Connor, 2003). The logistics service quality analysis of MDP was show in the following figure.

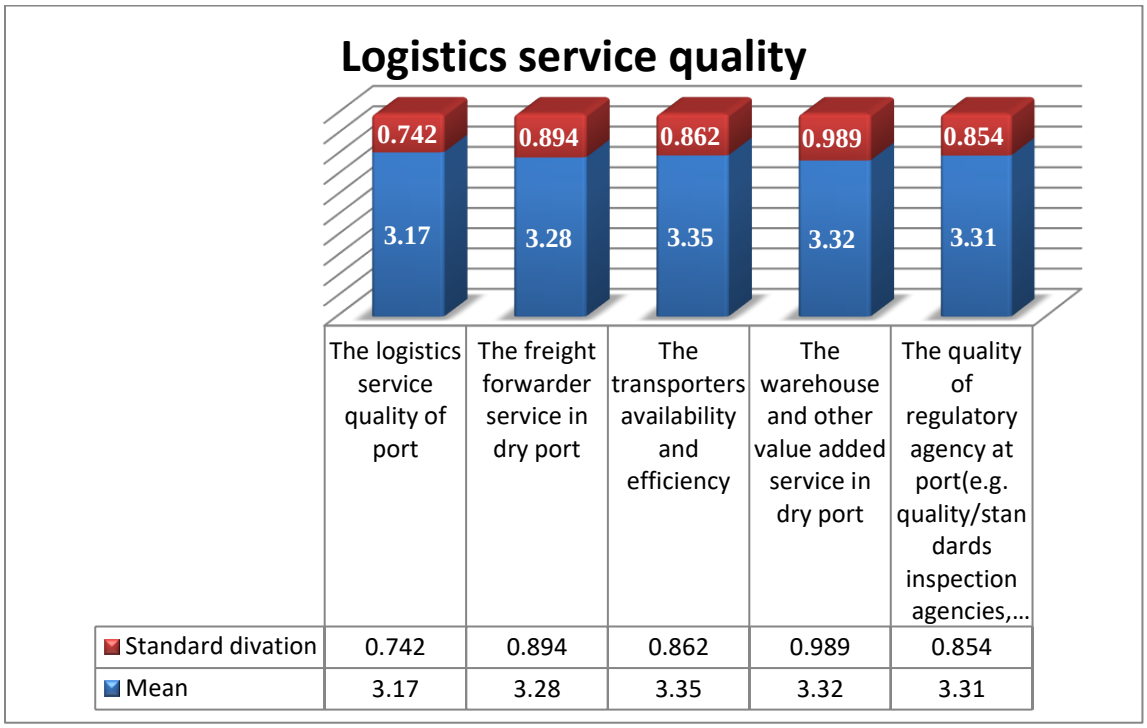

Figure 4. 2 Respondents views on logistics service quality performance

Source: Own Survey, 2020

As observed from the above figure 4.2 port logistics service quality significance level for logistics performance of dry port was level of affect logistics performance according to respondent and the result was mean score of the respondents were for logistics service quality, freight forwarding service in dry port, transport availability and efficiency, warehouse and other value added service in dry port and quality of regulatory agency at port was 3.17, 3.28, 3.32, 3.32, and 3.31 respectively. Based on this result logistics

service quality were at Modjo dry port impact on logistics performance moderate. Thus it needs improvement to perform better and high performing in logistics performance

4.4.4 Timeliness at MDP

The time to complete trade transactions is useful outcome measure of logistics performance. (Jean *et al*., 2018). Merckx (2005) defines the container dwell time as the average time a container remains stacked on the terminal and during which it waits for some activity to occur. The timeliness analysis of MDP was show in the following figure.

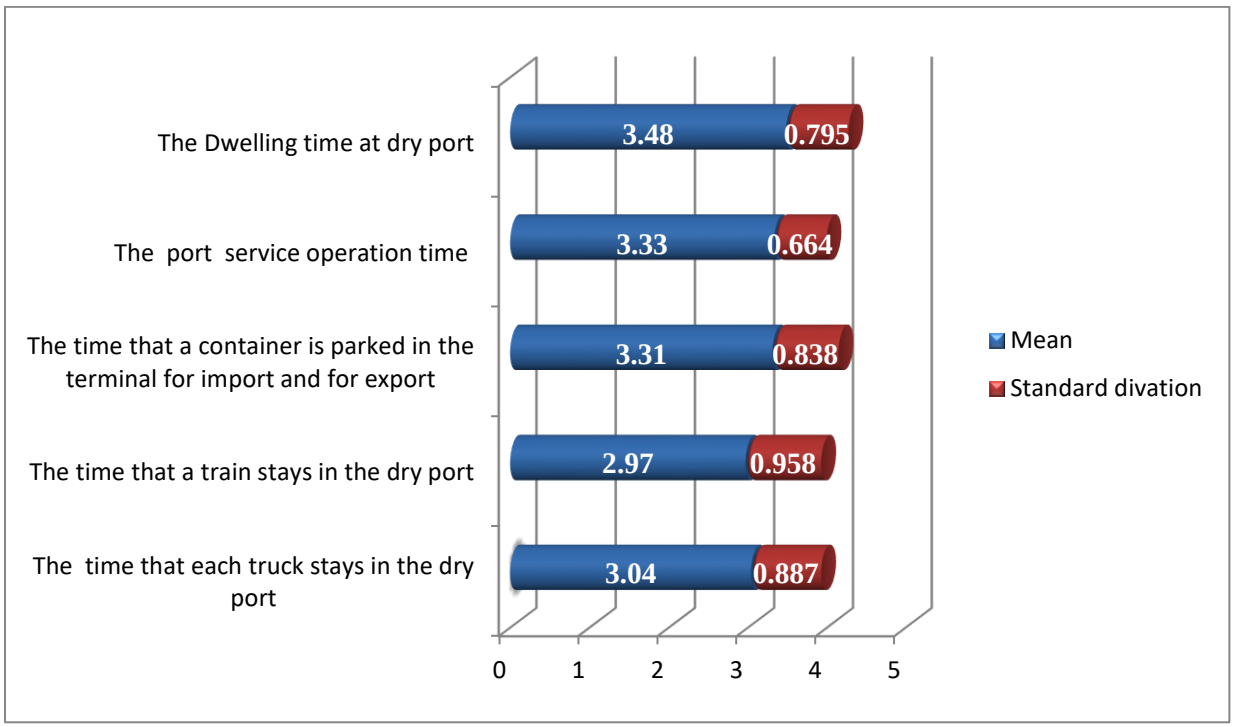

Figure 4. 3 Respondent View on timeliness performance

Source: Own Survey, 2020

As observed from the above figure 4.3, asked the respondents the time that truck stays in dry port, the time that train stays in dry port and time that container parked in terminal the result was the mean value of the respondents were 3.04, 2.97, and 3.31 which confirms that respondents have average impact for performance .however in port operation time and dwelling time at dry port, the mean value of the respondent was 3.33, and 3.48 respectively under high level. Based on these result on port service operation time and

dwelling time were at dry port high impact on Modjo dry port and its indicator of need of improvement dwelling time.

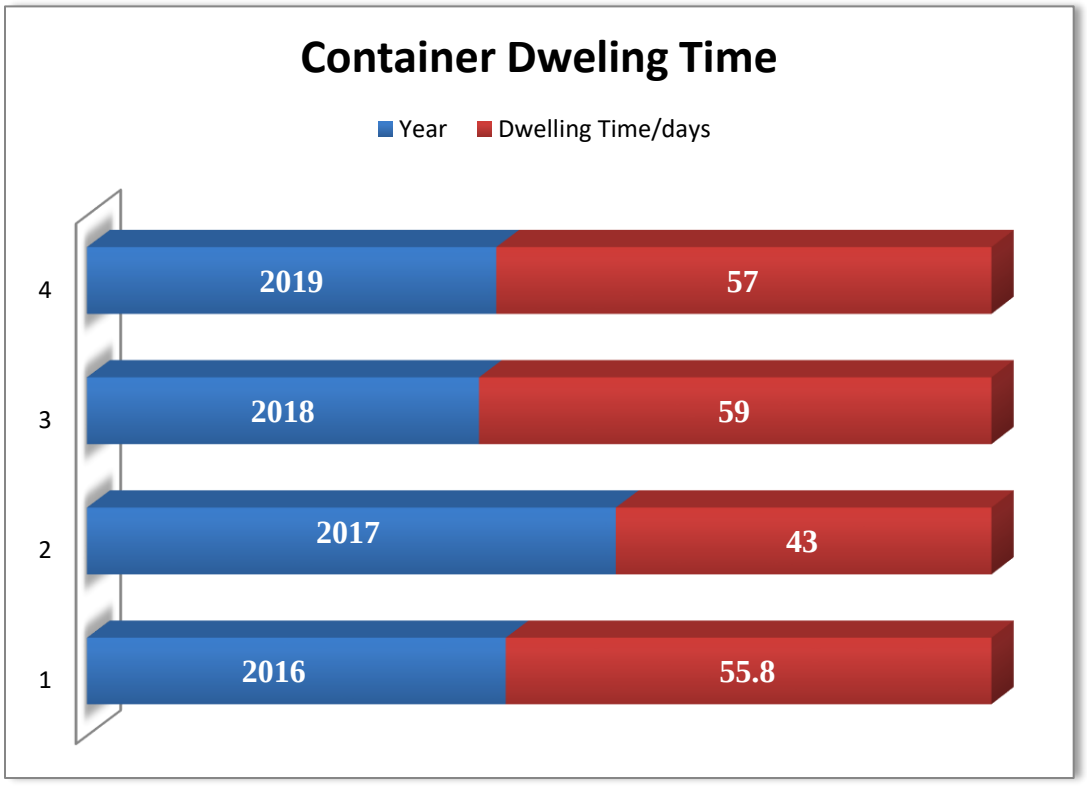

Figure 4. 4 Container Dwell time at MDP

Source: ESLSE Statistical Bulletin 2011 EFY

The ESLSE was measure port container dwelling time show in four consecutive years it indicate high its affects the operational efficiency of Modjo dry port. Thus in terms of container dwelling time the port logistics performance indicated low and inconsistency performance. This indicates container store in port for long period of time its affect the logistics performance of the port. Information was presented on the above figure for clear understanding.

4.5 Comparison of Average Mean

Given information table 4.7, average means score of logistics activity and performance indicators the logistics performance of MDP.

Logistics Activity	Average Mean
Transport Management	3.85
Inventory Planning and Management	3.86
Warehouse Management	3.58
Customer Response	3.48
	3.69
Performance Indicators	**Average Mean**
Customs Clearance	3.29
Port Infrastructure	3.20
Logistics Service Quality	3.28
Timeliness	3.23
	3.25

Table 4. 7 Average Mean

Source: Own Survey, 2020

As observed as the table 4.7, inventory planning and management, transport management, warehouse management logistics activities highest score. While customer response, customs clearance, logistics service quality, timeliness, and port infrastructure average score. Based on these result logistics performance in transport management, inventory planning and management, warehouse management highly mean score the MDP logistics performance and as per as result high logistics performance on these activates. However on customer response practice at MDP score average and it need improvement to achieve higher customer response by fulfilling customers' orders on time.

4.6 Inferential Stastics Analysis of MDP

This section presents correlation analysis in relation to between the variable and the relationship between logistics activates and dry port performance indicator was investigated.

Correlation a form of research in which you observe what naturally goes on in the world without directly interfering with it. This term implies that data will be analyzed so as to look at relationships between naturally occurring variables rather than making statements about cause and effect (Andy, 2018).

According to (Andy, 2018), If the correlation coefficient falls between 0.1 to 0.29, it is weak or small; 0.3 to 0.49 is moderate; and > 0.5 to 1.0 is strong or large relationship between variables. Hence forth, in this study Bivariate Spearman's Coefficient (r) was used to examine the relationship between the variables by using a two-tailed test of statistical significance at the level of 95% significance, $P< 0.05$.

The Bivariate Correlations procedure computes the pairwise associations for a set of variables and displays the results in a matrix. It is determining the strength and direction of the association between two scale or ordinal variables. Spearman's correlation coefficient: a standardized measure of the strength of relationship between two variables that does not rely on the assumptions of a parametric test. (Andy, 2018)

Pairwise correlation matrix of among transport management, inventory planning and management, warehouse management, customer response and performance indicators as presented in the following table 4.8.

Table 4. 8 Pairwise Correlation Matrix

			TM	IPM	WM	CR	PI
Spearman's rho	TM	Correlation Coefficient	1.000				
		Sig. (2-tailed)	.				
		N	75				
	IPM	Correlation Coefficient	.726**	1.000			
		Sig. (2-tailed)	.000	.			
		N	75	75			
	WM	Correlation Coefficient	.641**	.599**	1.000		
		Sig. (2-tailed)	.000	.000	.		
		N	75	75	75		
	CR	Correlation Coefficient	.560**	.454**	.717**	1.000	
		Sig. (2-tailed)	.000	.000	.000	.	
		N	75	75	75	75	
	PI	Correlation Coefficient	.085	.209	.273*	.298**	1.000
		Sig. (2-tailed)	.467	.072	.018	.009	.
		N	75	75	75	75	75

**. Correlation is significant at the 0.01 level (2-tailed). Source: Own Survey, 2020

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

Given the information table 4.8, the correlation between among transport management(TM), inventory planning and management (IPM), warehouse management (WM), customer response, and performance indicator there is strong and statistically significance pairwise correlation. Transport management has a strong positive relationship with inventory planning and management and statistically significance with a confidence of 99 percent. This display in table as ($r = .726$, $p < 0.01$). These finding indicated that there is a significant correlation between the two variables as ($r > 5$) with a 1 %($p < 0.01$). Transport management also shows a positive relationship with warehouse management with the result of ($r = .641$, $P < 0.01$). This result implied the two variables are

strongly related with a confidence of 99%. The third positively and strongly correlated between transport management and customer response with the value of ($r = .560$, $p < 0.01$). There is also a positive and strongly Significant relationship between warehouse management and performance indicators ($r = .273$, $p < 0.05$). And the last correlation was found between customer response and performance indicators ($r = .298$, $p < 0.01$).

All the dry port logistics activates ; transport management(TM), inventory planning and management (IPM), warehouse management (WM), customer response, indicators was statistically and positively correlated with dry port performance indicators.

4.7 Discussion and Interpretation

There were four logistics activities in Modjo dry port. The first one was transport management logistics activities performance. As seen from the result on table 4.2, the grand mean for this activity was revealed as 3.85. This implies that most of the respondents agreed good performance of transport management activities in MDP. The other logistics activities inventory planning & management for contribution & significance for customer service, role on port performance, and contribution for profitability. As seen from the result on table 4.3, the grand mean for this activity was indicating 3.86. This implies that most of respondents agreed on inventory planning and management performance of Modjo dry port good and well. The other logistics activities on Modjo dry port was warehouse management where respondents perceived to be performed better like inventory planning and management activities. As seen from the result on table 4.4, the grand mean for warehouse management found to be 3.58. The last identified logistics activity on Modjo dry port was customer response where respondents perceived its activity average. As seen from the result on table 4.5, the grand mean result for customer response was 3.48. Therefore, as per as result show among four logistics activities the customer response need improvement compare to other (transport management, inventory planning & management, and warehouse management) were better and well performed.

There were four identify logistics performance indicators for Modjo dry port namely customs clearance, port infrastructure, logistics service quality and timeliness. Based on the analyzed data customs clearance was found to be ranked first with a mean score of 3.29 followed by logistics service quality with a mean score of 3.28. Timeliness and port infrastructure were ranked third and fourth respectively by score mean of 3.23 and 3.20 These figures imply that performance on timeliness and port infrastructure need improve for better performance. On port high dwelling time, low technology and ICT infrastructure facing low performance for logistics activities of Modjo dry port.

Correlation analysis of all logistics activities indicate statistically and positively correlated with port performance indicators. As seen from the result on table 4.8, transport management (r =0.467), customer response (r =0.298), warehouse management (r =0.273), and inventory planning and management (r =0.209). All variables except transport management have moderate positive relationship with performance indicators small association. However, relationships between independent logistics activities were positively and strongly significant relationship with each other.

CHAPTER FIVE

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a brief summary of major on summary, conclusions and recommendations based on analysis made on chapter four. The chapter has three major sections namely 5.2 summary, 5.3 conclusion and 5.4 recommendations.

5.2 Summary of findings

Based on data analysis, discussion of results with respect to the basic research questions in the survey, the following are the summary of major findings of this study.

- The data was collected from Modjo dry port workers, Out of total 83 questioners 75 respondents were returned and participate. These were manly male (64%) remaining was female; most are first degree holders (85.3%) and experienced worker.
- There were four logistics activates in MDP. On conducting transport management of delivery, assurance of performance, achieving efficiency, for maximizing profit and score grand mean score 3.85. The inventory planning and management, warehouse management and customer response logistics activates for significance, space optimization, reducing operational cost MDP performance of logistics activities as per as study result well operated and performed a grand mean score 3.86, 3.58, and 3.48 respectively. Comparing performance of logistics activities of MDP were show high.
- The results and finding from MDP performance indicates in terms of customs clearance, port infrastructure, logistics service quality and timeliness. Based on the analyzed data customs clearance was found to be ranked first with a mean score of 3.29 followed by logistics service quality with a grand mean score of 3.28. The timeliness and port infrastructure was also a grand mean score of 3.23

and 3.20 respectively. Thus most of respondent the performance of MDP was performed average. These results imply that the MDP performance needs improvement in logistics performance.

- The study also found by inferential analyses of all variables correlation in bivariate correlations of all variables were positively and strongly significant related each other.

5.3 Conclusion

Based on the results obtained from analysis and finding the following conclusions are made for dry port logistics performance study.

The finding of the study indicates that the logistics performance in terms of logistics activates performance of MDP addressing for measure transport management performance in role for achieving efficient and fast delivery, to utilizing warehouse and for maximizing profit of dry port logistics performance. The transport management performance of Modjo dry ports well perform it's ensuring the port logistics performance and efficiency.

As shown above the inventory planning and management performance of the port based on significance and role show higher performance, and play significant role the port logistics performance. The efficient inventory planning and management activities achieving benefits in three areas: Cost, quality and time efficiency.

As can been seen the other logistics activity in MDP is warehouse management performance of the port in terms of role and space optimization show high. To achieving warehousing objectives of minimizing the cost of labour, space, and equipment the port follow continuous improvement process.

In fact customer response practice of the port shows average performance in MDP. These results imply that MDP need improvement on customer service response practice of the port by working with all stakeholders. Additionally to managing all port relationships and

interactions with port user customers manage by apply customer relationship management.

The findings of the study in MDP logistics performance indicates based on customs clearance speed, simplicity, predictability and efficiency, port infrastructure availability, quality, Logistics service quality efficiency, and quality, timeless for operation performance are average. The MDP performance indicators port infrastructure and timeless affected the port logistics performance some problems such as low technological and ICT tools availability, high dwelling time, and trucks stay time in dry port indicate the port logistics performance highly affected. MDP have improved port infrastructure related with ICT problems. Overall logistics performance of MDP from the findings of the study is evaluated and measured as per as respondent response average performance. Thus it implies that MDP logistics performance to support country import and export trade require improvement.

In the final analysis four indicators of dry port logistics performance were developed and addressed in this study and all variables were rated the average mean value. It shows require improvement towards the performance indicators of the dry port. The correlations between variables are statistically and positively correlated.

5.4 Recommendations

Based on the study results, findings and conclusions, the following recommendations are made:-

- First from logistics activities perspective even if the finding of the study in general the transport management, inventory planning and management, warehouse management, and customer response logistics activity performance result obtained by the study revealed operating well however, there are concern that need to be taken and addressed for a better performance like factors related to evaluation the port logistics performance by use different performance evaluation model and not only accept customers comment and complain solved at

all, fulfilling customers' orders in promised date. Modjo dry port should be considered availability, flexibility, and efficiency of transportation, inventory planning and management, warehousing and customer response these can achieve the port by applied appropriate approach.

- Secondly, Modjo dry port to improve and achieve high logistics performance should working collaborate and jointly with all stakeholders like Customs commotion, Regulatory agency (Ministry of Trade, Ethiopia Investment Commission…etc.), transport company, freight forwarders, and shipping company.

- The finding of the study related with customs clearance, port infrastructure, logistics service quality, and timeliness the logistics performance of port should be give attention port infrastructure equipment, technology and ICT, availability of value added service (consolidation, fumigation, and cold warehouse) and other service for import and export. Therefore, in order to improve the logistics performance of Modjo dry port ESLSE should invest on port infrastructure and equipment.

- Ultimately, to improve all over logistics performance of the port by identifying bottlenecks and area where as port user customer mentioning services needs to be improving.

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Appendices

Appendix I – Questionnaire

Addis Ababa University

College of Business and Economics School of Commerce

Dear Respondents,

This questionnaire is designed to gather information on "***The Dry port Logistics performance of Modjo dry port.***" The purpose of the study is to fulfill a thesis requirement for the Masters of Art in Logistics and Supply Chain Management. The information that you provide will be used only for the study purpose and will be kept strictly confidential.

Finally, I would like to thank you in advance for your cooperation and dedication of your valuable time to fill this questioner.

Sincerely Yours,

Sileshi Alebachew

Please Note:-

No need of writing your name

Indicate your answer with mark (√) on appropriate block/cell for all questions.

If you have any question, please contact me with the following address:-

Contact Address

If you have any question, please contact me with the following address:-

Phone No. 09-11 876721 and

E-mail: sila.alb@gmail.com

Part I. Background Information

1. Gender a) Male b) Female

2. Age Group a) 18-25 b) 26-35 c) 36-46 d)47-55 e) 56 and above

3. Education Background

a) Secondary school and below b) Completion of High School c) Diploma

d) First Degree e) Second Degree and above

4. Position and status in the organization

a) Senior Manager b) Middle Level Manager c) Lower Level d) Other ____

5. Work experience in Organization?

a) 1-5 Year b) 6-10 Years c) 11-15 Years d) Above 15 Years

Part II. Modjo Dry Port Logistics Activities

Dear respondent:

This section of the questionnaire addresses the logistics activities of Modjo Dry port. Please read each statement applied to the MDP and indicate the extent of your agreement towards the statements by putting a tick mark (√) in the boxes representing your judgment. Please use the rating scale representing your level of agreement as follow:

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

	1. Transportation Management(TM)	**CODE**	**1**	**2**	**3**	**4**	**5**
1	Transport management has a role in achieving faster delivery service	1TM1					
2	Transport management ensure the port logistics performance	1TM2					
3	Transport management has a role in achieving efficiency in port operation	1TM3					
4	Transport has a position in maximizing a profit of MDP	1TM4					
5	Transportation management sometimes used as storage to utilizing warehouse cost	1TM5					

	2. Inventory Planning & Management(IPM)	CODE	1	2	3	4	5
1	Inventory management contributes for prompt service to customer.	2IPM1					
2	Proper inventory management improves customer service	2IPM2					
3	Inventory management has a significant role on port performance	2IPM3					
4	Proper management of inventory contributes for profitability of dry port.	2IPM4					
5	Inventory management has a significantly enhance customer service	2IPM5					
	3. Warehouse Management(WM)	CODE	**1**	**2**	**3**	**4**	**5**
1	Warehouse has an effect on reducing operational cost of dry port.	3WM1					
2	Warehouse management plays a major role in customer satisfaction.	3WM2					
3	Proper identification of all storage location	3WM3					
4	Storing goods according to recommended guidelines	3WM4					
5	Storage space optimization	3WM5					
	4. Customer Response(CR)	CODE	**1**	**2**	**3**	**4**	**5**
1	Responding quickly to the customers' needs	4CR1					
2	Fulfilling customers' orders in the promised date	4CR2					
3	Sharing information with customers when required	4CR3					
4	Measuring and evaluating customer satisfaction level.	4CR4					
5	Accepting the customer comments	4CR5					

Part III. Modjo Dry Port Performance

This section of the questionnaire deals with indicators of the performance of Modjo dry port. You are therefore expected to undertake your personal evaluation of the performance extent of the Modjo Dry port based on your experiences with the port as a stakeholder.

Please put a tick mark (√) in the boxes against each rating scale of choice. The rating represents your level of agreement as follows:

1=Very Low, 2= Low, 3= Average, 4=High, 5=Very High

		Rating				
1.Customs Clearance (CC)		**1**	**2**	**3**	**4**	**5**
1	The speed of customs clearance & procedure					
2	The customs operation simplicity and predictability					
3	Efficiency of customs service					
4	The time to obtain a gate out authorization with physical inspection					
5	The time to obtain a gate out authorization without physical inspection					
2.Port Infrastructure(PI)		**1**	**2**	**3**	**4**	**5**
1	The logistics area where cargo logistics operations done.					
2	The terminal container storage capacity					
3	The number of cargo handling terminal equipment					
4	The technological and ICT tools available					
5	Port infrastructure quality					
3.Logistics Service Quality(LQ)		**1**	**2**	**3**	**4**	**5**
1	The logistics service quality of port					
2	The freight forwarder service in dry port					
3	The transporters availability and efficiency					
4	The warehouse and other value added service in dry port					
5	The quality of regulatory agency at port(e.g. quality/standards inspection agencies, health/sanitary and Phytosanitary agencies)					
4.Timeleness(TL)		**1**	**2**	**3**	**4**	**5**
1	The time that each truck stays in the dry port					
2	The time that a train stays in the dry port					
3	The time that a container is parked in the terminal for import and for export					
4	The port service operation time					
5	The Dwelling time at dry port					

Thank You

Appendix II- Correlation matrix among variables

			TM	IPM	WM	CR	PI
Spearman's rho	TM	Correlation Coefficient	1.000	.726**	.641**	.560**	.085
		Sig. (2-tailed)	.	.000	.000	.000	.467
		N	75	75	75	75	75
	IPM	Correlation Coefficient	.726**	1.000	.599**	.454**	.209
		Sig. (2-tailed)	.000	.	.000	.000	.072
		N	75	75	75	75	75
	WM	Correlation Coefficient	.641**	.599**	1.000	.717**	.273*
		Sig. (2-tailed)	.000	.000	.	.000	.018
		N	75	75	75	75	75
	CR	Correlation Coefficient	.560**	.454**	.717**	1.000	.298**
		Sig. (2-tailed)	.000	.000	.000	.	.009
		N	75	75	75	75	75
	PI	Correlation Coefficient	.085	.209	.273*	.298**	1.000
		Sig. (2-tailed)	.467	.072	.018	.009	.
		N	75	75	75	75	75

**. Correlation is significant at the 0.01 level (2-tailed). Source: Own Survey, 2020

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