Assessment of the Modjo Dry Port Integration to Modjo Town, Ethiopia

Tadele Moges Tadese

A Thesis Submitted to the Department of Architecture, School of Civil Engineering and Architecture

Presented in Partial Fulfillment of the Requirement for the Degree of Master of Science in Urban Planning and Design

Office of Graduate Studies Adama Science and Technology University

May, 2022
Adama, Ethiopia

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Declaration

I hereby declare that this Master Thesis entitled "Assessment of the Modjo Dry Port Integration to Modjo Town, Ethiopia" is my original work. That is, it has not been submitted for the award of any academic degree, diploma or certificate in any other university. All sources of materials that are used for this thesis have been duly acknowledged through citation.

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Recommendation of this thesis, hereby certify that we have read the revised version of the thesis entitled “Assessment of the Modjo Dry Port Integration to Modjo Town, Ethiopia” prepared under my/our guidance by Tadele Moges Tadese submitted in partial fulfillment of the requirements for the degree of Mater of Science in Urban Planning and Design.

Therefore, we recommend the submission of revised version of the thesis to the department following the applicable procedures.

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Co-advisor	Signature	Date

Approval Page

We, the advisors of the thesis entitled "Assessment of the Modjo Dry Port Integration to Modjo Town, Ethiopia" and developed by Tadele Moges Tadese, hereby certify that the recommendation and suggestions made by the board of examiners are appropriately incorporated into the final version of the thesis.

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Approval of Board of Reviewers

We, the undersigned, members of the Board of Examiners of the thesis by Tadele Moges Tadese have read and evaluated the thesis entitled "Assessment of the Modjo Dry Port Integration to Modjo Town, Ethiopia" and examined the candidate during open defense. This is, therefore, to certify that the thesis is accepted for partial fulfillment of the requirement of the degree of Master of Science in Urban Planning and Design.

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ACRONYMS AND ABBREVIATIONS

CBO	Community Based Organizations
EMAA	Ethiopian Maritime Authority Affairs
EPA	Environmental Protection Authority
ERC	Ethiopian Railway Cooperation
ESLSE	Ethiopian Shipping and Logistics Services Enterprise
FGDs	Focus Group Discussions
ETLP	Ethiopian Trade Logistics Project
GTP	Growth and Transformation Plan
ICD	Inland Container Depot
ICT	Information Communication Technology
MGLH	Modjo Green Logistics Hub
NGO	Non-Governmental Organizations
SD	Standard Deviation
SPSS	Statistical Package for Social Science

ABSTRACT

Modjo Dry Port started its initial operation in 2007 on 64 hectares of land and underwent further expansion by acquiring 86.922 hectares in 2015 and 4.75897 hectares for the railway spur connection. The port that lies along the Ethiopia-Djibouti route served as a site for lodging goods and services. It helped much in facilitating in-bound and outbound trade and businesses to and from Ethiopia. This Dry port significance arising from land-lockedness, congestion, and low port infrastructure provision perspective and its integration with the town in general is the focus of the research and to be addressed through reviewing the dry port experiences from developed and developing countries parallel to existing situation analysis at Modjo town. This served a purpose to look for a more appropriate approach to integrate the Modjo Dry Port to respond to the ever growing dry port demand by incorporating the development of the town. A strategic approach was followed to lead to modernization of the dry port whereby the necessary infrastructural development has been identified as crucial to bring about a quite commendable town development and giving the dry port a competitive and fit for state-of-art service delivery status. Accordingly this explanatory research assess Modjo Dry ports Plan and its integration with Modjo town in all related facilities and promote enhancement of the development of the town in specific and the country in general.

Key words: Land-locked, Assessment, Dry-Port Plan, Integration, Development, Modjo Town

CHAPTER ONE
INTRODUCTION

Ethiopia has been undergoing a commendable agricultural transformation and associated economic growth of double-digit for quite many years. This results an increase in the capacity of its exportable agricultural commodities and semi-processed animal products to countries in the Middle East, Far East, Northern Europe, etc. On the other hand, Ethiopia has been importing various items from the rest of the world to meet the demands of its population. The export and import transactions of Ethiopia highly demand the availability of dry ports infrastructure in place to cope up with the difficulties Ethiopia is facing as a land-locked country. Dry ports have a role to play in reducing congestion of exportable and importable items at ports. Thus Ethiopia is constructing a dry port in various parts of the country to allow export and import transactions to proceed in order to achieve further socio-economic development at the national and regional levels.

Carrying out a plan with integration of the town will help in shaping this project with a goal set to bring about the socio-economic development of Ethiopia as quoted above. In this regard, simultaneous treatment of the plan design is possible as they have common characteristics with regard to consideration of cash flow demand and implementation schedule. Although, the plan development is concerned with existing condition assessment, various components of analyses, be it utilization capacity and gap analysis, space program recommendation using site selection criteria along with developing functional relationships supported by spatial analysis and shaping capital commitment schedule development.

The plan prepared in this fashion can have a number of issues to dwell on such as target setting, prioritization, spatial dimension consideration, and strategy development with a view to bringing about full satisfaction of members of the project site in particular and satisfaction to users at regional and national level in general. Currently, all dry port plans prepared with leading international consultant/firm that have experience in the dry port plan and has standards of mainly European Union which make the country pay in hard currencies.

1.1. Backgrounds of the Study

Ethiopia is one of the fastest-growing economies in the world with an average gross domestic product (GDP) of 10% growth per annum (Admasu, 2017). The government, in its second Growth and Transformation Plan (GTP-II) 2015/16-2019/20, laid out a plan, dubbed by many observers as ambitious, with a view to maintain the growth performance records registered for the years in the past decade, and of achieving a middle-income country status by the year 2025.

To realize targets set in this ambitious plan, the Ethiopian GTP-II accords considerable emphasis to manufacturing and export diversification. Specifically, it identifies investment in manufacturing, development of industrial parks to boost foreign direct investment (FDI), provision of quality infrastructures in logistics, and skills development as key strategic focus areas (National Planning Commission, 2016).

To ensure and facilitate the effort channelled on to these priority areas, investment in the Ethiopia-Djibouti corridor was prioritized as a key strategic mechanism, given this route's central and strategic importance in the country's trade and logistic access-supply chains, both historically and contemporarily. Available data on the country's imports and exports backups the perspective that the Ethiopia-Djibouti transport corridor is a dominant gateway for the country where over 95% of Ethiopia's imports and exports have been taking place (PAD, 2017).

Ethiopia is try to provide services across all economic sectors such as agriculture, industry, construction, service, and other sectors of the economy by transporting containerized and non-containerized dry-bulk and general cargoes, and is providing door-to-door competitive, reputable, safe, and customer-focused service to the country's import and export demand in order to ensure sustainable economic development, inspite of the country's landlocked and poor infrastructure.

The current cargo flow to and from Ethiopia is embarrassing due to the lack of seaports and inadequate access to alternative transport corridors. As a result of the indispensable measure to reduce much of the cost burden, the expansion of "Dry Ports" has become one of the crucial objectives of the Government of Ethiopia.

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. The port has a capacity to handle 6,000 containers, measuring 20-ft (six meters), on 2012. Currently there are six additional dry ports operating to handle shipment from ports. These are Semera, Gelan, Dire Dawa, Kombolcha, Mekelle, and Kaliti Branches (Hiwot, 2016).

Modjo Dry Port, along the Ethiopia-Djibouti route, was marked as a site for lodging service expansion given its worth in facilitating trade and business. The Modjo Dry Port was established in 2007 on 62 hectares of land. In 2015, the Dry Port underwent further expansion acquiring additional 86.9 hectares of land from Kolba Gode Kebele in Lume woreda of the Oromia Regional State. The expansion gave the Dry Port its current size of 150.9 hectares and put it in a better position to accommodate the growing bulk of containers arriving from Djibouti Seaport.

Dry Ports can be built from scratch or they may be developed from an inland port including some additional facilities that are characteristic of Dry Ports. If an inland port have a high capacity traffic mode (i.e. rail) and offer the same types of facilities as can be found in a seaport (Stratmos, 2009) it can be theoretically counted to be a Dry Port:

Dry Ports bring about several advantages in cargo handling and in import and export process. Among these the most important are; reduction in Cost of Storage at the Sea Ports, reduction of Demand for Storage at the Sea Ports, avoidance of Demurrages, reducing Clearing and Forwarding Costs at Sea Ports, avoidance of Extension Maritime Insurance, greater Use of Existing rolling Stock, possibility of Consolidation, facilitation of Containerization, customs Staff Cost Reduction, increasing the predictability of arrival time of ships, better Control and Use of Transport Facilities and Possibility of Control over Transit Operations (Steder Group, 2009).

Hence, this study has become a necessity to alleviate this problem. This will pave the way to further facilitating the hinterland, regional and international scope trade relations that Ethiopia has and will continue to have as far as accessing seas and coping with possible influences that may arise to the extent of bringing about further milestones in developing the export and import transactions that will eventually result in scoring commendable economic

growth and development of the nation at large with benefits accrued to benefit those at the grass-root level.

1.2. Statement of the problem

The idea of the dry port is emerging in the country to tackle the constraints related to ports and for cost-effective use of the transport infrastructure. The need for a freight and logistics system is, therefore, fundamental to manage and control the material flows within the country, to and from ports, and logistical activities at the dry ports (Debela, 2013). Dry ports are specific sites to which imports and exports can be consigned for inspection by customs and which can be specified as the origin or destination of goods in transit accompanied by documentation such as the combined transport bill of loading or multimodal transport document (Steder Group, 2009).

The export and import transactions of Ethiopia highly demand the availability of dry ports infrastructure in place to cope up with the difficulties Ethiopia is facing as a land-locked country. Dry ports have a role to play in reducing congestion of exportable and importable items at ports. One of the active ports is Mojo Dry Port, which is nowadays working to fulfill one of the main objectives of its establishment, i.e., to handle the country's import and export. In the near future, Ethiopia will construct several dry ports in different parts of the country to allow export and import transactions to proceed in order to achieve further socio-economic development at the national and regional levels.

Carrying out Dry Port Plan Design studies side by side will help in shaping this project with a goal set to bring about the socio-economic development of Ethiopia as quoted above. In this regard, simultaneous treatment for Dry ports Plan standards has to be set in the research. More specifically it is concerned with existing condition assessment, various components of analyses, be it utilization capacity and gap analysis, space program recommendation, site selection criteria.

The existing dry port infrastructures which serve as basis for the development of the plan are described in this report. A visual onsite inspection has been conducted; as well as an examination of existing related documentation on the current features of the ports has been undertaken, including; port areas, buildings, utilities, pavement, rail cum road connection and current Development Plans.

Figure 1.1: Phase one and two Modjo Dry Port Plan (Source: Google earth, modified, 2022)

1.3. Objective of the Study

General Objective

To asses Modjo Dry ports Plan integration for all related facilities in order to promote the enhancement of the development of the town in specific and the country in general.

Specific Objectives

The specific objectives comprise of the following:

1. To assess standards for Dry Port Plan offering a complete picture, its facilities, and establishments;
2. To set consideration and standards of in the development of Dry Port Plan area paying particular attention to the town to social, environmental, security, risk, and safety aspects and compatibility of the existing and proposed facilities;
3. To optimize the different land uses within the Dry Port and its integration with the town;

1.3.1. Research Questions

The research questions for this research are:

1. Are there design standards and guidelines for the dry port plan?
2. Does the existing dry port plans play with regard to the long-term development of local town?

1.4. Significance of the Study

The output of this research might have its own contribution for the local community, policy makers, planners and other Research in the area. It would help the community, governments, NGOs, CBOs, and other responsible organs to be aware of the assessment of Dry Port Plan Integration in Town Development: A case of Modjo Town.

It would provide essential information to the local and national program designers and policy makers about the Assessment of the Modjo Dry Port Integration to Modjo Town, Ethiopia so that they would develop or revise their program.

1.5. Scope of the Research

The purpose of this research is to explore the development process of a large scale dry port and to recommend which measures and actions are needed in order to support the decision making process and ensure an effective and efficient dry port plan preparation that serves the city and the region's current and future needs. Thus the purpose is explored in the context of Modjo and the development process of the development of the dry port in the country. Any intervention in a complex logistics system must include the current dry port to be developed according to the strategic plan, and the dry port standards options. It also includes the system of local and regional distribution and warehousing centers in the metropolitan area and its surrounding.

1.6. Limitation of the study

The limitation for the research is mainly the lack of documented information and standards on the Dry port Plan at the national level. The official bodies which are concerned with the subject are very recent and do not have any such standardized documentation. The fact that the concern for a dry port plan in urban planning and design is recent has created a lack of a

specific official body to get information. The time limit of the study is confined the paper to the study is only the past and existing dry port plan and facilities prepared by international companies that paid with hard currencies and majority of the society don't have sufficient familiarity about dry port.

1.7. Organization of the Study

The study was organized by five chapters. These chapters were structured as follows. The first chapter incorporated introduction. Under introduction, background of the study, statement of the problem, objectives of the study, basic research questions, the scope and limitations of the study were described in detail.

The Second chapter was about a review of related literature. In this chapter, the conceptual, theoretical and empirical review of related literature about the assessment of Dry ports Plan preparation with all related facilities and promote enhancement of the development of the Modjo town in the study area and international practices in the field were addressed.

The Third chapter of this research was all about methodology of the study and the fourth chapter consists of Result and discussion. Finally, the last, chapter Five part of this research was all about conclusion and recommendation.

CHAPTER TWO

LITERATURE REVIEW

This chapter basically presented the secondary data which includes literatures, concepts, theories based on the objectives of the study area. This implies the general concepts of Dry Port, aim of the dry port. The Research was reviewed different literatures in order to address in depth investigation of the problem.

2.1. Theoretical Literature Review

2.1.1. Concepts and Definition of Terms

2.1.1.1. Plan

Planning is the method involved with creating and arrangement urban or rural areas. Progresses in this cycle are the utilization of open land, air, water, and the constructed climate, including structures, transportation, financial and social capacities.

2.1.1.2. Development Plan

Development plans are ready to accomplish a methodical development of metropolitan settlement which structures part of the territorial plans. The principal of the urban plans are ordinarily urban regions on account of more modest urban settlements and it remembers the encompassing related regions for the instance of major urban settlements.

2.1.1.3. Structural Plan

A structure plan could be a system to direct the improvement or redevelopment of an region by characterizing end of the advancement and make develop designs, provision of open space, the layout and nature of infrastructure (including transportation links), and other key features and constraints that influence how the effects of development are to be managed.

2.1.1.4. Integration

An approach to urban planning aimed at designing a sustainable and socially cohesive urban environment, which takes into account the linkages between a broad range of variables and stakeholders in order to achieve an optimal and community-shared outcome.

2.1.1.5. Integrated Plan

Integrated planning is a process involving the drawing together of level and sector specific planning efforts which permits strategic decision-making and provides a synoptic view of resources and commitments. Integrated planning acts as a focal point for institutional initiatives and resource allocation. In the context of integrated (or comprehensive) planning, economic, social, ecological and cultural factors are jointly used (CEMAT, 2006)

i. Dry Port

The following definition for dry ports by Roso, Woxenius, & Lumsden, (2009) is widely cited in the literature: "a dry port is an inland intermodal port directly connected to a seaport by rail, where customers can leave and/or collect their standardized units as if directly to the seaport". Accordingly, a dry port has two main characteristics. It has a multimodal rail connection to at least one seaport, and it offers seaport functions. A more general working definition is provided by UNESCAP, (2013): "a dry port can provide services for the handling and temporary storage of containers, general and/or bulk cargoes that enters or leaves by any mode of transport".

Both definitions are comparable to the extent that containers are handled inland, where the latter exclude explicit mention of a rail connection. The former definition by Roso et al., (2009) is most commonly kept in literature. Dry port research can be considered as a relatively new concept in the literature of trade transportation, compared to traditional port research, about which there have been significant numbers of publications in the last decades and even centuries before. Until 2000, the number of articles considering the dry port concept was limited to just three (on www.scopus.com) and it increased since. Witte, Wiegmans, & Ng, (2019) reviewed publications considering the dry port concept and highlighted the increase in attention for the topic recently.

Definition of the concept A dry port "is an inland intermodal port directly connected to a seaport, with high-capacity traffic modes, preferably rail, where customers can leave and/or collect their goods in intermodal loading units, as if directly to the seaport" Roso et al., (2009). This definition is used as a reference in this research as it is commonly cited in academic papers and provides a unique definition of the concept.

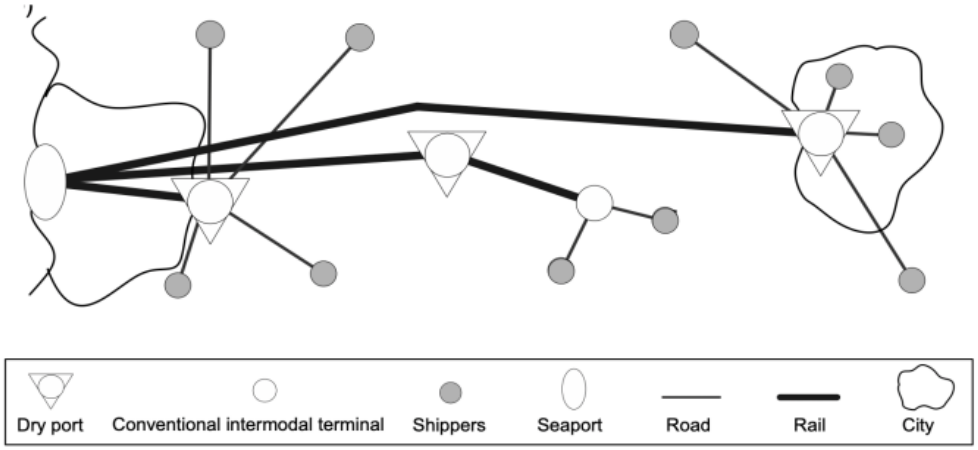

Figure 2.1: Dry port concepts (Source: Roso et al., 2009)

ii. Dry-Port Integration

Dry port integration is a planning approach close connected with the complex nature of the cities and the dry port with a necessity of creating sustainable and resilient settlements. The implementation of integrated Dry port planning is directly connected to the socio-economic conditions, legal frameworks, technology, professional and educational potentials of societies, which differ for each country. Research has shown, through concrete examples, that the practice of integrated planning is more prevalent in cities in EU countries than in post-socialist countries. This article focuses on the case study of the Republic of Srpska, where there are many problems in its implementation. Based on the analysis, it can be seen that it is necessary to constantly work on improving the methodology of integrated planning, education, and the training of planners and stakeholders, as well as strengthening the institutional and socio-economic preconditions for its implementation, particularly in post-socialist countries.

2.2. Dry port and Town

a) Sustainability of the dry port

Because of the broad and clear upsides, the development of a dry port is an interesting opportunity when improving the sustainability of a seaport. The negative effects of this measure on the transport system and on the surroundings of the dry port have been less extensively discussed. The net effect on sustainability is disputed, as dry ports move the

seaport problems inland, instead of solving them (Rodrigue & Notteboom, 2009; Witte et al., 2019). For example, increases in congestion, emissions, and nuisance are going hand in hand with the development of a dry port (Black, Roso, Marušić, & Brnjac, 2018; Witte et al., 2019). In addition, the presence of the dry port in the network enables an increase in the capacity of the seaport. As a result, emissions per ton of cargo might decrease, but total emissions grow due to the increase of throughput. A critical view of the sustainable effect of dry port development on the dry port location itself is lacking. Because of increasing interest in dry port development and sustainability, this is an important topic to address.

Studies on the sustainable benefits of dry ports in the transport network are extensively available, whereas those on sustainable development, Development of ports includes both constructions of a new site as well as expansion of an existing port are rare. This study aims to fill this gap in the literature by evaluating a dry port expansion project as its own system and constructing an evaluation framework for the sustainable expansion of dry ports specifically.

b) Dry port characteristics

Dry port characteristics can be used for the interpretation of expansion alternatives. In literature, dry ports are mostly classified based on functions, distance to the seaport, and primary development aim (Nguyen & Notteboom, 2016). The former classification is related to the efficiency and operational characteristics of a dry port, while the latter two are linked to the size and capacity of a dry port. These classifications are explained in more detail and dry port characteristics important for expansion are highlighted.

c) Efficiency and operational characteristics

The first classification of dry ports is based on the functions they offer. (Villiers, Mackay, & Serafino, 2013) identifies three types of dry ports in addition to a dry port only having the core infrastructure. The services of different levels use a comparable classification where the simplest level, “core infrastructure”, is referred to as a container yard and the level of basic logistics services is referred to as ICD. Offering warehousing encompasses most of the basic logistics services whereas offering VAS encompasses the next level. In addition to characteristics specific for dry ports, there are a number of parameters that affect the efficiency of seaports as well as dry ports.

Automation (or ICT), equipment, and the quality of the ground infrastructure are those considered in this study (Mohseni, 2011; Zheng, 2015).

d) Size characteristics

The second classification is based on the distance between the dry and seaport (Rodrigue & Notteboom, 2009; Roso et al., 2009). Whether it is referred to as distant, midrange and close, or inland, satellite, and gateway port, the implications for the functions are comparable.

The benefits from distant, or inland dry ports are primarily due to the modal shift from road to rail (Roso et al., 2009). The midrange or satellite dry port is established predominantly for the consolidation of cargo, whereas the close or inland dry port is primarily constructed to increase the capacity of the seaport. Even though this is true for dry ports in general, the distance between the two ports does not necessarily reflect the characteristics and functions of a dry port.

e) Aim of the dry port

The third classification is based on the primary developing aim of the dry port: import or export-driven (Monios & Wilmsmeier, 2012). The import-driven dry port is also referred to as outside in dry port, as goods flow from outside the country to the hinterland, or the following port, as the seaport is largely involved in determining the throughput of the dry port. The counterpart, an export-driven dry port is referred to as an inside-out dry port, where the goods flow from inside the country to the seaport. If the dry port plays a larger role in the supply chain, an alternative name is a leader dry port. It is generally believed that developed countries are likely to have more sea-driven dry ports than developing countries. Exporting shippers in developing countries are mostly small or medium-sized, and it is preferred to consolidate goods before transporting them to the seaport (Nguyen & Notteboom, 2016). However, research on dry port development in Africa is insufficient and generalizations about countries in this continent are difficult to make.

2.3. Best practice in Dry port development

Many countries have developed dry ports to facilitate trade and cargo flows between seaports and final destinations. Based on the experiences of dry port development in Europe,

Africa, America, and Asia, this section reveals the development of the dry port concept and reviews the function of dry ports in the seaport system, the challenges faced by these dry ports and the strategies for improvement.

2.3.1. Dry Ports in Europe

Swedish dry ports play a significant role in the seaport system (Bergqvist et al., 2010) by being space providers, container buffering zones, intermodal transports zones, and value added logistics service providers to the containers (Woxenius and Bergqvist, 2010).

In the Scandinavian region, dry ports have faced challenges such as the location of dry ports not being in the East-West corridor, a lack of skilled laborers, low capacity of rail links and limited length of rail tracks (Viser et al., 2009). Some strategies have been identified to harmonize the Scandinavian dry port operations. For example, the introduction of combined infrastructure such as road and rail networks increases freight volumes to seaports and at the same time reduces the traffic congestion in seaports. Scandinavian dry ports also introduce creative, innovative and competitive services to attract stakeholders to use their facilities (Bergqvist et al., 2010). A different approach has been implemented in Valencia dry port, Spain. This dry port introduces a Port Community System (PCS) to integrate different stakeholders in seaport operations and maritime transport by giving support, and managing information and administrative procedures in the dry port operation.

2.3.2. Dry Ports in Africa

'Forward-Ports' is a general term given to 428 African dry ports because most of the dry ports act as cargo delivery stations with high speed and security. These forward ports not only execute the role of intermodal port but also balance the traffic between rail and road transportation, providing customs and border management services (Ahamed, 2010). However, Raballand et al. (2008) indicated that many dry ports are not well operated because of insufficient logistics infrastructure and inefficient services to the customers, which have led to poor connectivity to seaports and delays in container clearance. For example, a dry port in Egypt was unable to provide sufficient infrastructure, maintenance, and systematic legislative and institutional processes to optimize their involvement in the seaport system (Vandervoort and Morgan., 1999).

Therefore, governments in African countries, especially in Nigeria, South Africa and Tanzania, have initiated a strategy of upgrading the logistics infrastructure to improve dry port operations, aimed at enhancing the connectivity to seaports and reducing container dwelling time from 15 days to an international standard of 7 days (World Bank, 2008;Ahamed, 2010).

2.3.3. Dry Ports in America

Dry ports facilitate seaport container traffic flow and provide competitive inland services such as high level inland connectivity and seaport capacity expansion (Rodrigue, 2011). They act as regional distribution facilities with the capacity to segregate containers for various distribution centers through various modes of transportation (Bruce et al., 2013). For example, Chilean dry ports perform as logistics platforms in the logistics chain and have an extended capacity to accommodate the largest volume of container traffic and highest value of international trade in South America (Aversa et al., 2005). Other dry ports such as Virginia Dry Port in the United States and Los Andes Dry Port in Chile overcome issues of over congestion, increase the application of modal shifts and generate sufficient container volume to seaports (Bruce et al., 2013).

2.3.4. Dry Ports in China

Fierce competition among seaports places pressure on the efficiency of the supply chain network, and hinterland connection is regarded as a major determinant for seaport competitiveness (Wang, 2009). In addition, in coastal cities, a strong need for urban development due to growing populations has limited the availability of land for seaport expansion. Therefore, Chinese seaport-based dry ports were developed for the purpose of capturing more cargo flowing along the inland supply chain and to relieve capacity constraints at seaports (Zhong, 2010; Beresford et al., 2012).The government invests in roads and rail networks to enhance the connectivity between seaports and dry ports to increase the volume of containers and to promote regional economic development (Qin, 2010).

2.3.5. Dry Ports in India,

Dry ports are known as container freight stations and inland container depots. The emergence of Indian dry ports has enhanced seaport competitiveness by reducing traffic

congestion, improving Logistics Performance Index (LPI) and increasing capacity (UNESCAP, 2006). The challenges of Indian dry ports include insufficient interactions between the stakeholders which provoke extra costs, overlaps in the schedules which can create bottlenecks in infrastructure planning. Hence, the strategies of information sharing between stakeholders, integrated facility sharing and coordination of facility development have been proposed to assist Indian dry ports in reducing unnecessary costs and generating a smooth flow in the daily schedule (Sahay and Mohan, 2009).

2.4. Lesson learned

One rising and significant topic emphasized by this study concerns the investigation about dry port case studies, best practices and their relationship with the dry port development. In general, challenges faced by dry ports in different countries vary. Therefore, the strategies to overcome those challenges may be different, but they have to ensure that the dry ports are able to fit into the complex seaport system. Dry ports must improve the interaction of various stakeholders operating with different objectives in the facility distribution network, which will ultimately contribute to seaport competitiveness in dry port development.

It is not necessary for dry ports to have identical design standards to function effectively as inter-related components of regional integration. But, there is need for some consistency among them as to basic services offered and design of infrastructure needed to provide these services. Since the budget for the construction and equipment of dry port is very huge, different option has to be considered which can be Public-Private Partnership.

Furthermore the literature review helps to explain the factors that influence the development and implementation of a dry port and explaining the effect of integration of the town that the dry port is built. The benefits of dry ports are that they can provide solutions to overcome congestion problems occurring at the port.

2.5. Research gap

Since the thesis topic is somehow different there is a research gap in literature review. Literature regarding the subject related to Dry Port development and town integration is not that much found at international national level. This create to make detail, various and wide literature review.

CHAPTER THREE

RESEARCH METHOLOGY

The intent of this section of research was to describe the methodology which employed in order to collect data for the research such as description of research design, source of data, research participants of the study, data collection instruments, and data analyzing methods.

3.1. Location and Description of the study area

The study area is situated at linear distance of 75km South East of Addis Ababa near the town of Modjo. The coordinate of the town is 8° 37’ North and 39° 09' East which is situated between Bishoftu and Adama and at a junction to SNNPR. Modjo is the most important commercial and industrial hub in Ethiopia. Modjo Dry port is linked to the sea ports of red Sea and the North Indian Ocean by Road and rail. The dry port consisting of 61 hectare of land and 120 hectare of new expansion project, with a total of 181 hectare of land.

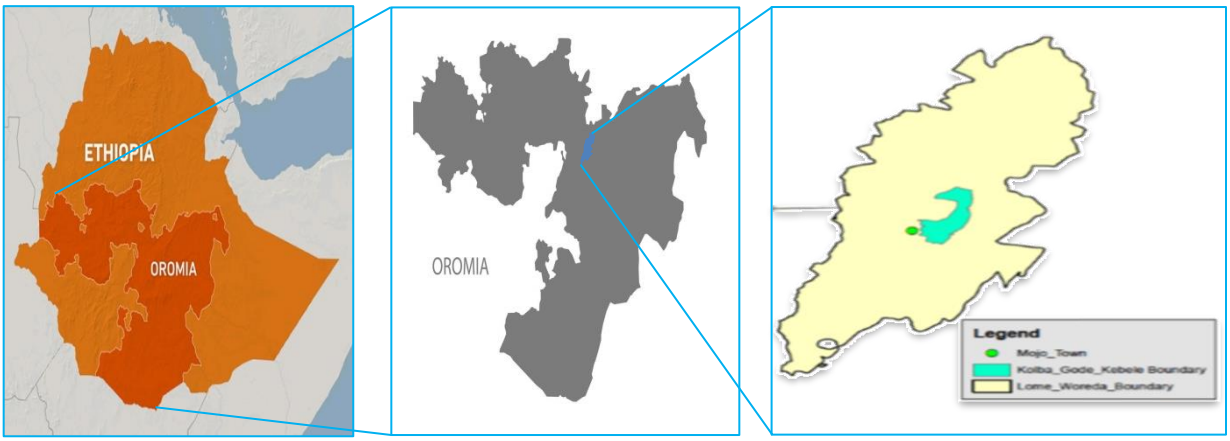

Figure 3.1: Location Plan (Source: Modjo Town Administration and review)

3.2. Research Design

Research design can be considered as the structure of research it is the “Glue” that holds all of the elements in a research project together, in short it is a plan of the proposed research work (Millia, 2016). Research design also refers to the overall strategy that one chooses to attack the problem which requires integration of different components of the study in a coherent and logical way, thereby, ensuring to solve the problem in efficient way (Grover, 2015).

There are three possible forms of research design: exploratory, descriptive and explanatory. The base of classification relies on the purpose of the research area as each design serves a different end purpose. The purpose of a descriptive study is to provide a picture of a situation, person or event or show how things are related to each other and as it naturally occurs. However, descriptive studies cannot explain why an event has occurred and is much suitable for a relatively new or unexplored research area. Therefore, in situation of abundant descriptive information, alternative research designs such as explanatory or exploratory approach is advisable.

Exploratory research is conducted when enough is not known about a phenomenon and a problem that has not been clearly defined (Saunders et al., 2007). It does not aim to provide the final and conclusive answers to the research questions, but merely explores the research topic with varying levels of depth. On the other front, an explanatory study sets out to explain and account for the descriptive information. Explanatory research looks for causes and reasons and provides evidence to support or refute an explanation or prediction. It is conducted to discover and report some relationships among different aspects of the phenomenon under study (Tesfaye, 2018).

Depending on this, the research was used descriptive research design to describe the existing situation of the issue and explanatory sequential analysis method to explain or elaborate the quantitative data through or by using qualitative data. The type of research strategy that the Research used was survey in order to extract information from large population or sample for generalization.

Regarding to time dimension of the research; the Research utilized cross-sectional. In a cross-sectional study, the investigator measures the outcome and the exposures in the study participants at the same time (Sing, 2016). Thus, as this research was conducted at a point in time, the Research was used cross sectional in the time dimension.

3.3. Research Approach

Quantitative research approach is one of the research approach in which numbers are used to explain findings (Kowalczyk, 2016). Contrary to quantitative research approach, qualitative research approach has been in existence only for a few decades (Creswell, 2003). Rather than use numbers, qualitative research methods use descriptive procedures to generate

meaning and understanding of the phenomenon being studied (Powoh, 2016). A mixed research approach is relatively new and still under development (Creswell, 2003). A mixed method combines quantitative and qualitative methods in the same study in order to get a full understanding of the phenomenon under study.

The nature of this research was academic based on purpose and mixed according to approach. Since, the Research was used descriptive research design. Depending on this, the Research tried to describe the assessment of Dry ports Plan preparation for all related facilities and promote enhancement of the development of the town. Above all, the descriptive nature of the research design enables to describe the research issue both quantitatively and qualitatively. Questionnaires, interview (semi-structured) were employed as a data collection tools for this research in order to gather information from households and experts. Following this fact, for the purpose of this research, the Research was used a mixed research approach, the explanatory sequential analysis method which was quantitative – qualitative (quant.-qual.) sequential analysis method.

3.4. Sampling Design

3.4.1. Population

According to Newman (2003), population refers to "the entire set of objects or group of people, which is the object of research and about which the Research wants to determine some characteristics is called the population or the universe". The universe can be described as the entire population with which the research is concerned. Whereas a sample is the parent or group from which is to be formed and finally generalize the whole population. Accordingly, the target population for this study was 120.

3.4.2. Sampling Techniques

The Research was employed both probability (proportional stratified random sampling and systematic random sampling) and non-probability (judgmental or purposive sampling) methods. The probability sampling method ensures that both the representative and the respondents had an equal chance of being chosen. To select respondents for probability sampling, the Research was used first proportional stratified sampling and then systematic random sampling.

This aided the Research in minimizing biases by giving each respondent an equal chance of being chosen and then followed by purposive sampling technique or judgmental sampling technique. However, as Neuman (2014) pointed out in qualitative research, the goal of the study might not necessitate a representative sample from a large number of cases. As a result, the Research was frequently used a non-probability sample that better suits the study's objectives.

Hence, under non-probability sample the Research used purposive sampling technique from the respondents of the study area for qualitative parts of the study to get relevant information on a highly specific relevant issue and deals in detail. Furthermore, it aids in the identification of specific types of cases for further investigation via an interview to gain a better understanding of the issues from the expertise of the field in the study area. In addition, the Research was conducted semi-structured interview with carefully chosen 5 key informants in order to conduct in-depth research on the topic.

3.5. Source of Data

The fundamental differences between primary and secondary data are; the term primary data refers to the data originated by the Research for the first time while secondary data is the already existing data collected by the investigator agencies and organizations earlier (Oluwatosin, 2017).

3.5.1. Primary Sources of Data

For the purpose of this study, the primary sources of the data were gathered from the households, government officials and experts of the area of the study area through structured questionnaires and purposive sampling of professionals for interviews.

3.5.2. Secondary Sources of Data

The secondary sources of data were obtained from both published and unpublished documents, journals, articles, books, magazines, and reports.

3.6. Methods /Tools for Data Collection

Data is set of values of qualitative or quantitative variables. It is also facts or figures from which conclusions can be drawn. Before one can present and interpret information, there has to be a process of gathering and sorting data (Oluwatosin, 2017). To assess this study, the Research was used both primary and secondary source of data. From primary source of data,

questionnaires and interviews were used. In addition to this, observation was employed by the Research to identify the current and existing situation of the issue on the study area.

i. Questionnaire

To collect qualitative and a quantitative data, closed ended questionnaires were distributed to the target households so as to obtain relevant and valid information in order to solve the problem in the study area. The Research was prepared open-ended questions for qualitative data in order to allow the respondents to provide in depth information whereas close-ended questions were allowed respondents to provide predetermine response and to the Research to obtain and collect quantitative data. Most questionnaires were developed by using yes or no scale questions. Finally, these yes or no scales were weighted according to the degree of agreements and occurrences.

ii. Interview

Before interviewing the selected respondents, the Research was designed semi-structured questions for interviewing 5 key informants in the study area to get the desired data and cross check the validity of obtained data from the questionnaire. The interview session was applied to conduct first in Amharic language then translate to English language. It was also used for qualitative data collection methods.

iii. Observation

In order to obtain the real picture of the existing problems of the study, the Research was employed field observation as a data collection instrument tool on the study area. This was because of the reason which helped the Research in order to get real picture about assessment of dry port plan integration in town development the case of Modjo Town.

iv. Document analysis

For this research, the Research was utilized documents from annual reports of the dry port plan, policies, programs and other related documents to gather data from both qualitative and quantitative information.

3.7. Method of Data Analysis and Presentation

First, the quantitative data was collected through closed-ended questionnaires; then it was analyzed by descriptive statistic procedures, by using Statistical Package for Social Science

(SPSS) 25 software. The results were described in tables and percentages respectively using descriptive statics

To this, the data management was very crucial thing, so that the data's which were collected were edited, coded, cleaned and entered into SPSS, then it was analyzed in the forms of descriptive statistics such as frequency distribution and percentages.

Eventually, the scaling of the degree of agreements and occurrences were coded by using yes or no scale techniques. Following this, depending on the coding, each variable were computed thoroughly. In addition, in order to arrive at the result, the data was collected, organized, properly classified, tabulated and calculated. The statistical values were inferred for inferences. As the result, the data was organized by using figures and tables.

Second, qualitative data was collected by using open-ended semi-structured interview and analyzed in the form of thematically analysis, which was identified, analyzed and reporting patterns themes within the data. Therefore, the Research was collected a great deal of qualitative data to describe details about the assessment of Dry Port Plan Integration in Town Development: The Case of Modjo Town, Oromia National Regional State, Ethiopia.

Generally, the qualitative data was analyzed in the form of sentences and meaning which was obtaining through interview techniques. The data which analyzed were organized and presented through, tables and figures.

3.8. Validity and Reliability

Checking the validity and reliability of data collecting instruments before providing for the actual study is vital to assure the quality of the data. To ensure validity of instruments, initially the instruments were prepared by the Research and developed under close guidance of advisors. The questionnaires were pilot tested. The respondents of the pilot test were not included in the main study. Based on respondent's response additional, omission and modification of question were undertaken. Reliability test was also performed to check the internal consistency and accuracy of the measurement scales.

The internal consistency was analyzed using Cronbach's Alpha, describing the extent to which all the items measure the same concept or construct and, hence, it is connected to the inter-relatedness of the items. The reliability coefficients between 0.70 - 0.90 are generally

found to be internally consistent (Tavakol & Dennick, 2011). Thus, the average Cronbach's coefficient alpha in this study was 0.86, which is reliable.

3.9. Ethical Consideration

Ethical issues are an important issue that needs to be considered when conducting a research work. This research was conducted in a manner that is reliable and authentic with the ethical issues, which need to be considered. As Kivunja & Kuyini (2017) noted that the implementation of ethical considerations focuses on four principles which you need to uphold when dealing with your participants/respondents and data collections. These principles have privacy, accuracy, property, and accessibility as a pillar for every research. This research must consider the aforementioned principles as a basement.

Accordingly, the Research took a letter from Adama Science and Technology University, School of Civil Engineering and Architecture. Hence, the Research was informed the respondents and informants about the purpose of the study in the introduction part of the questionnaires and interview guide to the respondents or key informants; then after obtaining confirmation from those, a subject of confidentiality was protected.

In addition to this, the respondents or key informants were informed that their participation in this study was conducted based on their consent. Moreover, the Research also told them that the results of the research were not used to harm the respondents/participants; rather it had a benefit for the organization and employees. The Research was not personalized any of the respondent's response during data presentation, analysis, and interpretation. In fact, the Research should have respect the human right of respondents and informants. If the Research was violated the right of the respondent, the Research was liable by the law of the nation in addition to research ethics committees. Likewise, all the materials which used for this research purpose were properly acknowledged.

CHAPTER FOUR
RESULTS AND DISCUSSIONS

This chapter deals with the analysis, interpretation, and presentation of the data that have been obtained through questionnaire, interview and secondary methods of data collection. The quantitative data were collected from a total of 120 respondents, through simple random sampling techniques and additionally, interview also obtained from 5 interviewees.

Following this fact, the findings of this study were presented in four parts. The first part deals with general information of respondents that is the characteristics and background of respondents. The second part of this study focused on findings gathered through questionnaires from selected respondents by using simple random sampling method.

On the other hand, the analysis of this study is classified into three sections; such as assessment of standards for dry port plan, to set consideration of in the development of Dry Port Plan area paying particular attention to the town to social, environmental, security, risk, and safety aspects. The third part deals with the analysis of findings gathered through interviews and open-ended questions from purposely selected respondents in relation with the study issue.

The characteristics and background of respondents were examined in terms of sex, marital status, occupational category, age, and educational level of respondents. All respondents to this study were from the respondents of the study area. Besides, a total of 120 questionnaires were distributed to those of respondents that are selected through simple random sampling technique and all of the questionnaires were collected. Since, samples of 120 respondents were targeted from a population and a total of 120 questionnaires were completed and returned, resulting in a response rate of 100%. The total numbers of responses analyzed from 120 respondents.

Finally, analysis of the data collected from quant-qual ways regarding with the assessment of Dry ports Plan preparation for all related facilities and promote enhancement of the development of the town in specific and the country in general were tried to inculcate.

4.1. General Background of Respondents

4.1.1. Respondents by sex

There are a number of ways that the dry port development can evolve with a focus on diversity. One option is through concerted efforts such as policy change and research projects to understand why such developments are mainly appealing to males and what has to change for that to reverse. Thus respondent with two genders is partaken.

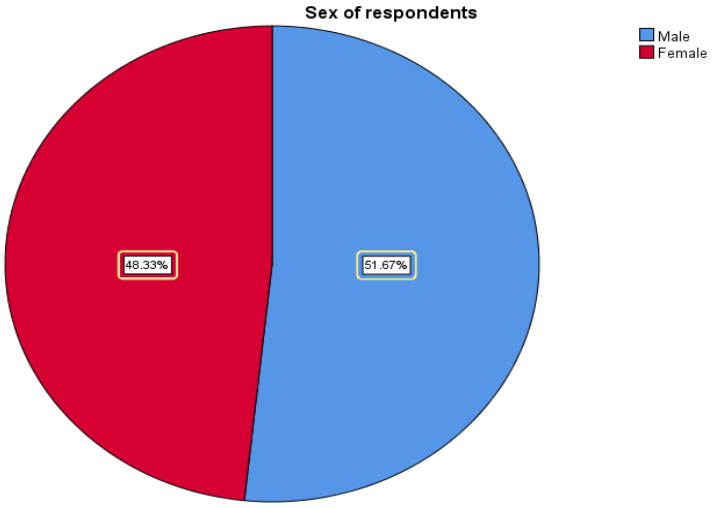

Figure 4.1: Sex of Respondents (Source: Field Survey, 2022)

As the above figure clearly shows out of 120 (100%) of the respondents 62 (51.7%) of them were male while 58 (48.3%) were female. As the figure shows the proportion of male and female respondents were almost similar. But, male respondents were a little larger. Although, this is due to the fact that the Research has selected samples by simple random sampling method.

4.1.2. Respondents by age

Given the differences in life experience between different age groups, as well as people's changing tastes and behavior as they get older, it can be very useful to include a survey age question. This characteristic of the age group,where people born around a similar time and within a particular generation typically share some similar characteristics and ways of thinking. Accordingly age respondent with five age groups is take part.

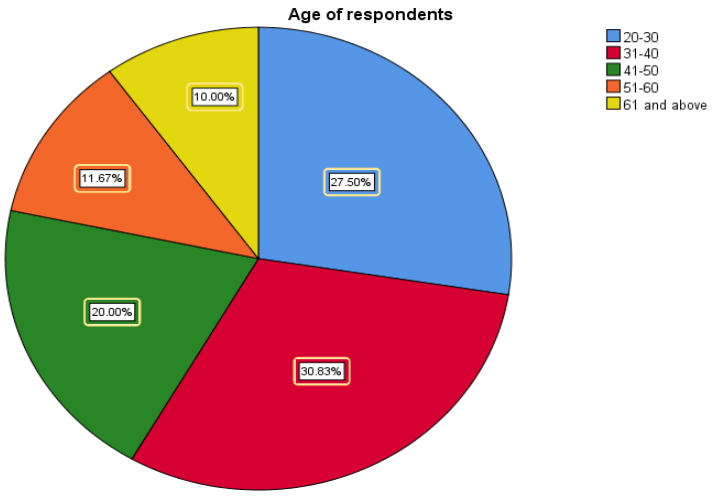

Figure 4.2: Age of Respondents (Source: Field Survey, 2022)

From the context of age, the highest number of respondents (30.8 in percent) were on the age group of 31-40 years followed by 20-30 and 41-50 with a percentage of (27.5%) and (20%) respectively. The age group 51-60 and 61 and above accounts 11.7% and 10% respectively, as shown above.

4.1.3. Respondents by marital status

Questions on marital status were asked of respondents in data collection time. In general, the resulting 'Marital Status' variable includes three coding categories: married, single and divorced.

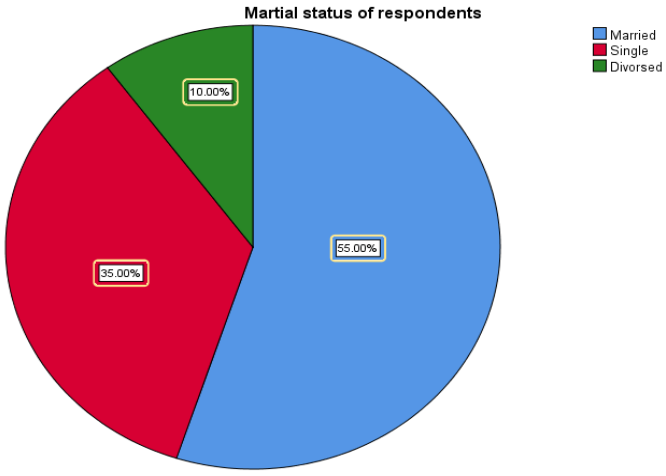

Figure 4.3: Martial Status of Respondents (Source: Field Survey, 2022)

As the above figure clearly shows the marital status of respondents 55% of the respondents were married, 35% were single and the remaining 10% of the respondents are divorced. As

this nominal data of the respondents clearly showed almost most of the respondents were married, a few of the respondents were single, and only some of the respondents were divorced.

As a result, most of the respondents who were participated in this study were married, followed by single and divorced respectively. So this helped to the Research to get appropriate data in the focal point with full of responsibility.

4.1.4. Respondents by educational level

Education is a core social background variable covered by all surveys and used in many statistical analyses, but very difficult to harmonize. To facilitate this task and support ex-the research that want to maintain as much information as possible from the original data.

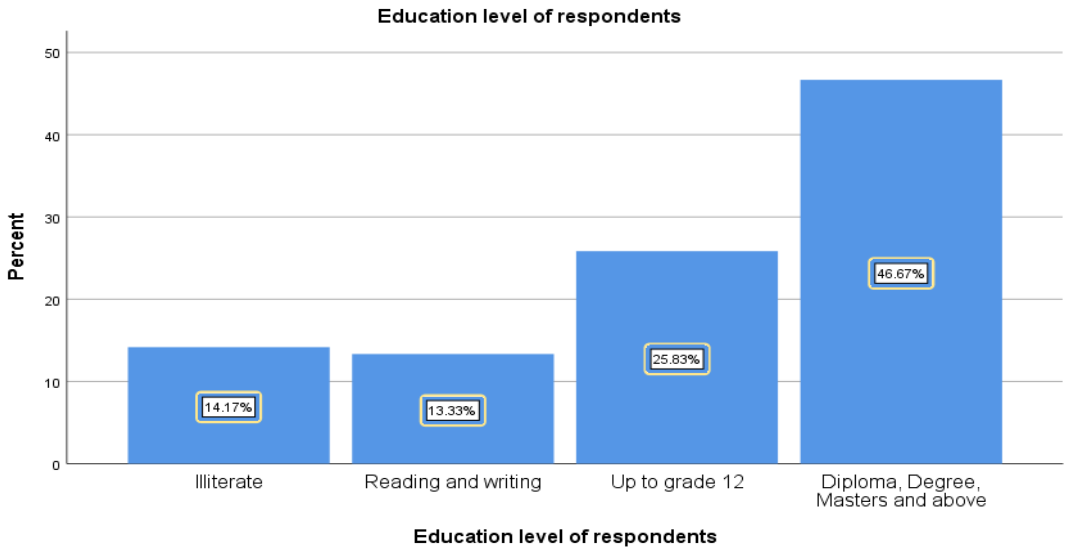

Figure 4.4: Educational level of respondents (Source: Field Survey, 2022)

As the above figure shows 46.7% of the participants of the respondents were diploma, degree, masters holders and above. On the other hand 25.8% and 14.2% of the respondents were illiterate. The remaining 13.3% of respondents would be able to read and write. As a result, this implies that most of respondents level of education were diploma, degree, and master's holders and above. This helped to the Research to get enough information to the focal point.

4.1.5. Respondents by Occupational Category

In some cases the Occupational Survey publishes information about job requirements, including the physical demands; environmental conditions; education, training, and experience; as well as cognitive and mental requirements. Then for this research we use three categories for the Occupational Category survey.

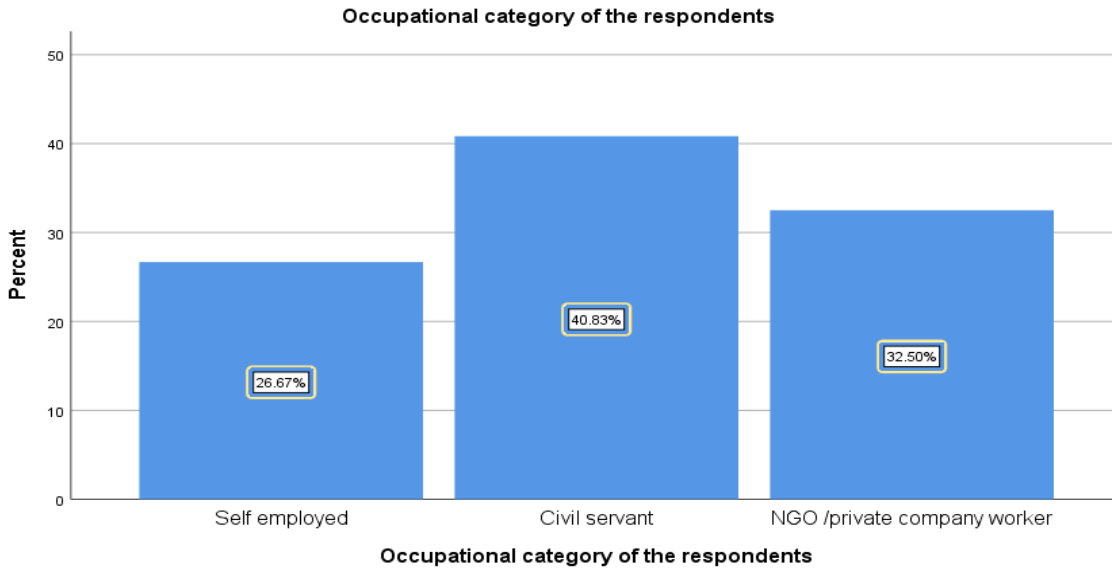

Figure 4.5: Occupational Category of the respondents (Source: Field Survey, 2022)

As the above figure clearly shows in the occupational category of the respondents of this research 40.8% of the respondents were civil servants, 32.5% of respondents were NGO/private company workers and 26.7% of respondents were self-employed. Although, there were a few respondents were working as civil servant and self-employed, majority (40.8%) of the respondents were NGO/private company workers.

4.2. Results and Discussion

The findings of the study on the assessment of Dry ports Plan preparation for all related facilities and promote enhancement of the development of the town in specific and the country in general is presented below.

On the basis of the facilities requirements, phase one and phase two layouts of the development of the Modjo Dry Port is prepared, keeping in view various considerations such as commodities to be considered, topography of the area, operational considerations etc.

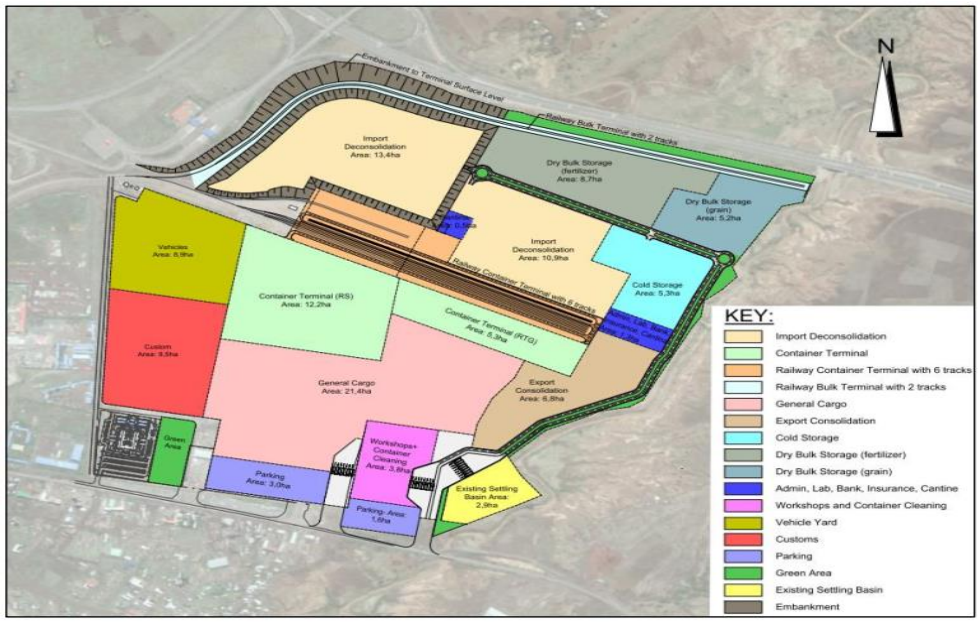

Figure 4.5: Modjo Dry Port Land use plan (Source: Modjo Dry Port)

4.2.1. Traffic flow

The development is increase in the surrounding area remarkably. A solution has been investigated to prevent all traffic passing through the city center of Modjo town. The following figure shows the current situation of the route which is mainly used by the truck traffic. When leaving the Addis-Adama Expressway via the closest expressway exit to the port, the trucks pass a toll booth and then travel through a residential area of Modjo town.

The traffic plan generally discusses two different kind of external types of truck traffic. These are container traffic and traffic of non-containerized goods, which are generated by the other Modjo Dry Port services/facilities like import deconsolidation, export consolidation including perishable goods, coffee and oilseeds, as well as grain and fertilizer import. The two traffic flows are separate mainly by the establishment of two different in-/out-gates. By the development of Modjo Dry Port traffic will increase in the surrounding area remarkably.

Figure 4.6: Current traffic route (Source: Google earth and site visit, 2022)

A solution has been investigated to prevent all traffic passing through the city center of Modjo town. A new road was under construction leading to the Modjo passenger train station of the new railway line. This access road is a four lanes road (2 lanes each direction) which is currently exclusively dedicated approach road for the passenger train station. The traffic plan for the surrounding area should be arranged as shown in the following figure.

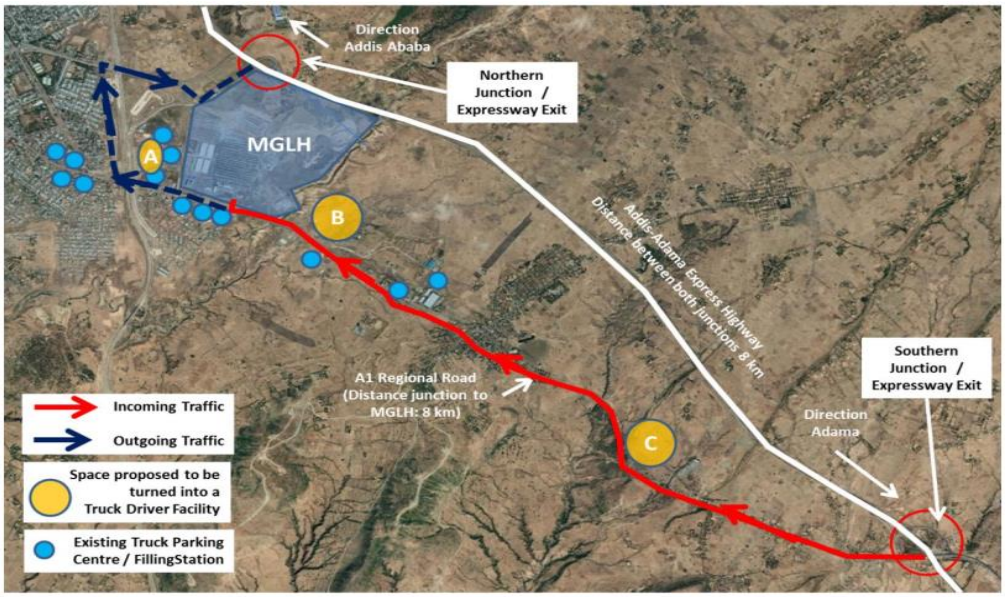

Figure 4.7: Traffic in Surrounding Area (Source: Google earth and site visit, 2022)

By increasing the truck traffic in the region one of MGLH's contributions to the surrounding community is the generation of a demand of services requested by truck drivers. It is recommended that those facilities will not be operated by the MGLH operator but by private local parties. Such facilities will also ensure that the truck parking space at MGLH is only used by trucks being processed regarding their paper works and not by trucks waiting for an inappropriate period of time.

Figure 4.8: Possible new access road (Source: Google earth and site visit, 2022)

4.2.2. Rail connection

The rail yard port, as seen in Figure 4.9, is located in the north of the port area. There are a total of 4 tracks located in the yard, 2 in the north and 2 in the south, with each track having a length of approximately 260 m within the rail yard area. The southernmost 2 tracks are serviced by a rail mounted gantry crane (RMG) which is currently not functioning. Standard gauge rail track (1.435 m) is used and the rail yard port is connected to the main railway network that connects to Addis Ababa and to Adama, which then continues on to Djibouti. As observed in the below figures, the pavement in the rail yard is constructed using concrete pavers, which appear to be in generally good condition throughout. Currently no information has been provided by the Client as to the layout and arrangement of utilities situated in the rail yard area.

Figure 4.9: Rail yard port (Source: Google earth and site visit, 2022)

4.2.3. Roads

A standard grid road network system allows travel within the dry port area as apparent in Figure 11. Access to the port from the Addis-Adama Expy highway (see Figure 4.10) is possible by the use of an exit to the north of the port area, followed by taking a route through the city of Mojo in order to enter the main gate in the south from the highway.

Figure 4.10: Road access to port (Source: Google earth and site visit, 2022)

4.2.4. Assessment of standards for Dry Port Plan

The following key factors in location and development of dry ports have been identified which are connectivity, location, system thinking and area for expansion, market, ware houses, long-term planning and cross-sector/organizational collaboration. Thus the following analysis is done at this stage.

Table 4.1: Response on the port development requirement items

No	Questions on port development requirement items	Yes	%	No	%	Mean	SD
1	Are port warehouse construction suitable for proper storage and handling of commodities?	83	69.2	37	30.8	3.77	1.24
2	Are outside premises are well drained?	63	52.5	57	47.5	4.02	0.98
3	Do you think that port warehouse structures properly maintained to protect commodities in storage?	76	63.3	44	36.7	3.62	1.27
4	Do adjoining property or nearby water source does not constitute an undue physical	51	42.5	69	57.5	3.75	1.20

No	Questions on port development requirement items	Yes	%	No	%	Mean	SD
	hazard to commodities in store?						
5	Do port premises and grounds are free of weeds, clutter, trash, unused equipment, or spilled commodities?	66	55.0	54	65.5	3.75	1.18
6	Is there handling equipment for 20 foot and 40 foot containers available?	65	54.2	55	45.8	3.70	1.19
7	Are there availability of office for an operator?	54	45.0	66	55.0	3.91	1.13
8	Is there vailability of office for clearing and forwarding agents?	60	50.0	60	50.0	3.89	1.21
9	Is there availability of reliable & efficient communication facilities?	71	59.2	49	40.8	3.88	1.22
10	Do container freight station with stuffing & unsnuffing service?	74	61.7	46	38.3	3.92	1.22
11	Are port areas are clean with a minimal accumulation of dust?	42	35.0	78	65.0	3.67	1.27
Port development requirement items Mean Score						3.80	1.19

Source: Field Survey, 2022

The above table shows the storage development conditions and items in the study area. As it clearly indicates regarding with the suitability of port warehouse construction for proper storage and handling of commodities, out of the 120 of total respondents, 83 (69.2%) of participants responded yes; 37 (30.8 %) responded no. On the other hand, respondents respond on outside premises are well drained, 63(52.5%) responded as yes and 57(47.5%) responded as no.

Regarding to port warehouse structures properly maintained to protect commodities in storage, 76(63.3) of respondents replied yes and 44(36.7) of them replied no. On adjoining property or nearby water source does not constitute an undue physical hazard to

commodities in store, 51 (42.5%) and 69 (57.5%) of the respondents responded as yes and no respectively.

From the contact of port premises and grounds are free of weeds, clutter, trash, unused equipment, or spilled commodities, 66(55.0%) of the respondents replied as Yes and 54 (65.5%) of them answered as no. On the availability of handling equipment's for 20 foot and 40 foot containers, 65 (54.2%) of respondents replied as yes and 55 (45.8%) of them replied as no. From the availability of office for an operator, 54 (45.0%) of the respondents responded as yes and whereas 66 (55.0%) of the respondents responded as no.

On the other hand, the availability of office for clearing and forwarding agents, 60 (50.0%) responded as yes and 60 (50.0%) of them no. On the availability of reliable and efficient communication facilities, 71 (59.2%) respondents answered as yes whereas 49(40.8%) of the respondents replied as no. of all 120 respondents on do container freight station with stuffing & unsnuffing service, 74(61.7%) replied yes while 46 (38.3%) no.

And finally port areas are clean with a minimal accumulation of dust 42 (35.0%) responded as yes and 78 (65.0%) of the respondents answered no. As this fact clearly shows the that except do adjoining property or nearby water source does not constitute an undue physical hazard to commodities in store, are there availability of office for an operator and are port areas are clean with a minimal accumulation of dust, the rest criterias or standards more than half of the respondents replied yes and few responded as yes.

For more out of the 11 standard takens by the dry port, by 8 of them the respondents responded positive response about the dry port. The mean score for over all respondent's response towards standards for dry port plan was 3.80 SD 1.19. This indicated that the port development requirement items was high.

4.2.5. Considerations in the development of Dry Port Plan

Many facilities and item are including within and around the dry port that can support the operation of the port and the development of the town. Consequently the following analysis is done based on the questionerie. Afterward the following analysis is done based on the survey.

Table 4.2: Response on the storage development conditions and items

No	Questions on port development requirement items	Yes	%	No	%	Mean	SD
1	Do commodities stored in an orderly manner?	58	48.3	62	51.7	3.67	1.26
2	Are commodities in store properly marked or identified?	62	51.7	58	48.3	3.89	1.08
3	Do commodities are clean and protected from bird droppings, dust, filth, and stains?	55	45.8	65	54.2	3.93	1.11
4	Are adequate and clean pallets used?	84	70.0	36	30.0	3.91	1.08
5	Are storage areas kept dry?	80	66.7	40	33.3	3.64	1.28
6	Are warehouse is clean and proper housekeeping practices used?	94	78.3	26	21.7	4.08	1.09
7	Are hazardous materials or contaminants are not stored near commodities?	74	61.7	46	38.3	4.20	1.03
8	Do warehouse is free of objectionable odors?	41	34.2	79	65.8	3.90	1.12
9	Do damaged or nonconforming products are removed from the port storage areas?	56	46.7	64	53.3	4.13	1.06
Storage Development Conditions And Items Mean Score						3.92	1.12

Source: Field Survey, 2022

The above table shows that consideration in the development of Dry Port Plan. According to the response of the respondents the following outcome were obtained. Based on this, do commodities stored in an orderly manner, 58 (48.3%) of respondents responded yes while 62 (51.7%) answered no.

From the context of, are commodities in store properly marked or identified, 62 (51.7%) of respondents responded yes and 58 (48.3%) of them no. Do commodities are clean and protected from bird droppings, dust, filth, and stains 55 (45.8%) of the respondents

responded yes. On the other hand 65 (54.2%) of the respondents replied no. From the context of adequate and clean pallets used, 84 (70.0%) of the respondents answered yes others 36 (30.0%) no.

Are storage areas kept dry, the response obtained from 120 respondents, 80 (66.7%) responded yes and 40 (33.3%) no. On the cleanness of warehouse and proper housekeeping practices used, 94 (78.3%) and 26 (21.7%) of respondents replied yes and no respectively. According to the response of the respondents on the question of are hazardous materials or contaminants are not stored near commodities, 74 (61.7%) of the respondents answered yes and 46 (38.3%) yes.

Furthermore, Warehouse is free of objectionable odors, 41 (34.2%) and 79 (65.8%) of respondents responded yes and no respectively. And finally damaged or nonconforming products are removed from the port storage areas 56 (46.7%) of respondents answered yes whereas 64 (53.3%) of the respondents responded as no. Based on the above data, from the 120 respondents for the questions, do commodities stored in an orderly manner, do commodities are clean and protected from bird droppings, dust, filth, and stains, do warehouse is free of objectionable odors and do damaged or nonconforming products are removed from the port storage areas, less than half of respondents replied that yes and large number of respondents responded no.

By five criteria's, large number of respondents agreed to respond yes. Based on the three questionnaires, such as, are adequate and clean pallets used, are storage areas kept dry and are warehouse is clean and proper housekeeping practices used 84%, 80% and 94% respectively responded as yes. This implies that by far more than 80% of them agreed to reply yes. The mean score for over all respondent's response towards set consideration in the development of dry port plan was 3.92 SD 1.12. This indicated that the storage development conditions and item was high.

4.2.6. To Set Consideration of Development of Dry Port Plan Area Paying Particular Attention to Social and environmental Issues

Projects have the power to make a better world to create new jobs; advance diversity, equality and inclusion; provide essential infrastructure; enhance education; improve public health and safety. Environmental management for successful project completion and

operation is also mandatory issue. Every day, projects help the world take one more step toward social and environmental issue of its surrounding.

Table 4.3: Consideration of Development of Dry Port Plan Area Paying Particular Attention to Social Issues

No	Questions on port development requirement items	Yes	%	No	%	Mean	SD
1	Are outside premises are well drained?	63	52.5	57	47.5	4.02	0.98
2	Do you think that port warehouse structures properly maintained to protect commodities in storage?	76	63.3	44	36.7	3.62	1.27
3	Do adjoining property or nearby water source does not constitute an undue physical hazard to commodities in store?	51	42.5	69	57.5	3.75	1.20
4	Do port premises and grounds are free of weeds, clutter, trash, unused equipment, or spilled commodities?	66	55.0	54	65.5	3.75	1.18
Port development requirement items Mean Score						3.78	1.16

Source: Field Survey, 2022

The above table depicted that the consideration of development of dry port plan area paying particular attention to social issues. Respondents whom replied outside premises are well drained are 63 (52.5%). To the reverse 47.5% of them responded no. Similarly, for the question, do you think that port warehouse structures properly maintained to protect commodities in storage, the respondents responded yes account 76 (63.3%) and no 44 (36.7%). On the other hand, among 120 respondents who were part of the sample on the question of do adjoining property or nearby water source does not constitute an undue physical hazard to commodities in store, 51 (42.5%) responded yes and (57.5%) no. And finally, on the question of do port premises and grounds are free of weeds, clutter, trash,

unused equipment, or spilled commodities, 66 (55.0%) of respondents replied yes and 54(65.5%) of respondents responded no.

In general, of the four criteria, in three of them more than half of the respondents responded yes. This indicates that the importance of the dry port plan integration in town development a case of Modjo town from the context of social issue is good. The dry port is friendly with Modjo town development. The mean score for overall view of set consideration of development of dry port plan area paying particular attention to social issues was 3.78 SD 1.16. This implies that the importance of the dry port plan integration in town development a case of Modjo Town from the context of social issue was high. It was friendly with social development.

4.2.7. Overall impact

The development of this dry port will affect the project surrounding in different ways. The social as well as economic well-being of the surrounding community can be influenced either positively or negatively. Analysis of the overall impact of the project under consideration is critical both at the time of its commencement and during its long lasting operations. Possible impacts need to be identified and evaluated so as to enhance positive effect and mitigate the adverse ones. In fact impacts are almost never confined with on the project surrounding or too few segments of the economy. They will have a wider multiplier effect that goes to the decision making. With this in mind, the possible socio economic impacts of Modjo Dry port will are examined from the following social and economic perspectives.

4.2.7.1. Economic impacts

4.3.7.1.1 Commercial and economic activity

Economic impacts are estimated in terms of jobs, personal earnings, business revenue, and state and local taxes. As the dry port operates like sea ports several activities will take place around the dry port. Hundreds of trucks will go to Modjo every day for loading and unloading and for moving cargoes to different destinations. A number of importers and exporters will visit Modjo to process their consignments Port related activities and services like transit, forwarding, packing and unpacking, loading and unloading, ware housing and other commercial activities will host a number of employees. Direct activities of the port

will, therefore, necessitate the purchase of goods and services creating direct and indirect economic impacts.

Demand for goods and services will increase rapidly. Port induced business will attract several businesses to Modjo town. As a result, revenues of hotels and Bars, retail shops, and other product and service providers will increase significantly. All these interactions generate income to the surrounding there by improving the social and economic well-being of residents of the area. The direct as well as indirect acties of the port will produce a multiplier effect encouraging investment and private sector involvement that promote trade and economic activity in the region. The increase population and economic activity resulting from the project will also lead to increase the tax base. The Modjo municipality and local Inland Revenue Authority will get incremental tax revenues. Beside all these benefiting outcomes however, a very likely adverse impact would be that the growing demand for public services and utilities will lead to unparalleled expenditure which may not be covered by the municipality alone.

4.3.7.1.2 Employment Opportunities

The commencement of Mosh dry will obviously open different employment opportunities with for the surrounding community and in migrating employees According to ADB's study, more than 200 direct employments is created at the initial year of operation. The number would increase subsequently on the coming years based on port's performance. In addition to the direct employment opportunity, other indirect and induced employment opportunities will emerge over time as an expected positive impact. A significant amount of skilled, semi-skilled and wage workers will get temporary employment during the construction process. At the time of operation, the emergence of port related services like, transiting, forwarding, packing and unpacking, loading and unloading, banking, insurance and other activities requires different types of labor. Moreover, the expansion of public services utilities and development of commercial activities will demand and host more man power. As a result, thousands people will get employed which would otherwise not be available. The employees hired receive wages and salaries (personal income), a portion of which is saved, while another portion is used to buy goods and services such as food, housing, clothing, health care, transport etc. A cumulative effect of all these employment opportunities will create a

value chain by increasing expenditures on goods and services which again affect revenue and income levels to local traders, the tax authority and revenue of residents.

4.3.7.1.3 Land use of Modjo Town

The Modjo dry port is located on 61 hectares of land 75kms south East of Addis Ababa about 3kms north East of Modjo town. This is a wide plot of land which is used for the construction of the port including customs ports, parking lots, internal roads, container depots, warehouses, offices and other facilities

Half of the land was occupied by farmers and the other half was owned by the town municipality. The establishment of the dry port has, therefore, resulted relocation of farm lands. The short term adverse impact on the farmers has already been tackled by a reasonable compensation for their land dispossessions.

As land is one of the economic resources, the municipality must be conscious of the land use patterns around the port and even consider future growth potentials of Modjo. The increased economic activity and the need for public services and utilities are likely to increase demand for more spaces. More importantly, demand for new housing and commercial investment will lead to a rise in the value of land and other properties. Presently, the price of land lease is increasing. In line with this progress wealth of residents can increase significantly.

The municipality should revise the plan of the town taking into account the overall social, economic and environmental changes. Future growth potential of the port and induced socio-economic activities should not be affected adversary. In other woods settlement of residents around the port should not bring an adverse effect on the normal operation of the port. Presently, the western bearer the port is allocated for residential houses. There is a need to control the immediate vicinity of the port as well as future potential development of the town. It is also important to maintain pod governance in the city administration to handle all matters in an effective way.

4.2.7.2. Social impacts

4.3.7.1.4 Population

Establishment of Modjo as a town dates back to the year 1944 EC. and stayed with a very slow social and economic growth rate until recently. Currently, the populations estimated to

be 29,540 of which 14, 352 are men and the remaining 15,388 are women according to the information obtained from the municipality based on 2001 EC census Out of these 11 whole sellers, 545 retailer 263 service providers, 60 small scale industries and I agro industry are engaged in trading activities.

Due to the commencement of the port the number of permanent and temporary residents will increase significantly. Initially during the construction of the project job opportunity is created for skilled, semi-skilled and wage laborers. Later on during operation and expansion process different facilities will require permanent workers. The in-migration of these workers and their families added to the people with commercial interest will change the size of population. The number of young force and business men will continuously increase to fulfill emerging demands. Development of the dry port expected to stimulate both economic and social activities which move the city forward and bring major changes that contribute to the development of the city and improvement to the quality of life. Still there is no bus or proper taxi service in the town.

4.3.7.1.5 Demand for community facilities and services

The incoming population added to existing residents is likely to create pressure on the casting facilities and community services. Depending on the magnitude and rate of change in the population size and the diversified activities, demand for housing, public utilities like energy and water supply, health, education, communication facilities, transport, waste disposal, recreational space etc will increase continuously With the increased interaction around the town crime and other security issues may arise demanding an additional police force.

Project related and induced accommodation requirements need to be matched by equivalent supply. However, many of the requirements could not be accommodated by the area municipality unless covered by national programs For example an increased passenger and cargo activity in the area may require development or expansion of road infrastructures. Therefore, involvement of the regional and central government is critical to alleviate the major infrastructure and accommodation problems. Particularly development of housing, construction of roads, transport facilities fire protection and other security issues require special support from the government.

4.2.7.3. Environmental

4.3.7.3.1 Evaluation of different environmental impacts and their mitigation measure

The activities that are implemented for the accomplishment of the dry port as such will have little or no direct effect on the environment. There are, however, some aspects of the proposed interventions which, unless carefully implemented and monitored, could potentially result in negative environmental effects.

4.3.7.3.2 Pre-construction stage

In the pre constriction phase that has already passed, compensation of the farm lands was conducted. Moreover phase two dry port expansion construction work is already started.

4.3.7.3.3 Construction stage

The construction activities that already under going for phase two dry port expansion constructions are: land preparation for construction, constructions of buildings, constructions of different warehouses, construction of pavement in the compound, preparation of container yard area, construction of maintenance facility and construction of water supply, storm water drainage and wastewater facilities System

The construction activities will result in direct physical effects on the environment. However, if these infrastructures (such as buildings, roads etc) are properly designed carefully constructed, and regularly maintained, there is likely to be a net improvement on the present conditions of uncontrolled soil erosion on the typical existing non engineered, poorly maintained compound and the surroundings of the port. Besides direct environmental impacts, rehabilitation activities could result in indirect environmental impacts. The next sections ensure that direct and indirect environmental impacts are evaluated and that negative environmental effects are minimal.

The construction activities are large-scale and will typically be undertaken with mechanical labor (bulldozer, grader, and compactor, etc). The construction activities and the potential environmental impacts include:

a. Use of heavy trucks and machines for construction. Potential environmental impacts include increase the noise level of the area. This increase in noise level will cause a noise pollution to the environment which will affect the living condition of the surrounding

residential area and the wild life in adjacent habitat by disputing feeding, nesting activities.

b. Clearing of the site. Potential environmental impacts include loss of arable land,
c. Loss of vegetation, and possible soil erosion during and immediately afterconstruction.
d. Drainage constructions such as ditches and cross drainage culverts. Potential environmental impacts include concentration of flow causing gully formation and erosion at culvert outfalls.
e. Addition of fill to cross valley bottom land. Potential environmental impacts include loss of wetland vegetation and altering of natural water courses
f. Installation of culverts at stream crossings Potential environmental impacts include constriction of channel flow resulting in upstream flooding
g. Improved surface material and grading in some locations Potential environmental impacts include water ponding in abandoned borrow pits and creating breeding grounds for mosquitoes. In addition, the use of a motor grader will create dust during operation.

After the development of the port there is an inevitable increase in traffic on the roads. This will likely result in an increase in dust, pose, and possibly traffic accidents. In addition, there is a greater population concentration.

4.3.7.3.4 Operation stage

The construction of the Modio dry port is bringing a number of positive impacts that justify the implementation of the project. The construction of the dry port will improve the national as well as the local economy by providing job opportunities for the locals and saving the foreign currency that is spend for the rest of the storage area in Djibouti.

Conversely, construction of the Modjo dry port will cause minor negative environmental impact. The potential significant environmental impacts include production and release of arable waste water, solid waste and noise pollution. These potential problems can be minimized to acceptable levels by adopting appropriate environmental mitigation measures during the execution and operation of the project.

In order to prevent or minimize the potential adverse environmental impacts related to implementation of the Modjo dry port environmental mitigation and monitoring measures specified below shall be implemented properly and timely. On this stage the expected

positive impact is the job opportunity that wall be provided for the Modjo community. However, the potential environmental impacts include:

a. Surface Pavement Potential environmental impacts include increase surface water run-off.
b. Generation a large amount of wastewater. Potential environmental impact includes pollution of the environment by its smell, pollution of nearby water source.
c. Large number of vehicles and heavy machines of in own and a maintenance facility for them. Potential environmental impacts include oil if collected and treated with the rest of the wastewater in the compound will cause a problems in the quality of the effluent from the treatment system.
d. Due to the generation of large amount of solid waste the expected potential environmental impacts is pollution of the surrounding environment because of its content.
e. If ground water used a source of water some impacts like contamination of water depletion of aquifer, change of ground water low might occur.

As indicated above, both the Government and society stand to gain from efficient dry port development. However, for related benefits to materialize, a comprehensive and integrated approach across government ministries could help ensure the long-term success of dry ports as inland growth centers. Initially, this may include providing:

a. Transport infrastructure connections and maintenance (ministries of transport, finance);
b. A conducive policy environment for business (ministries of commerce, trade, finance);
c. Government services and facilitation activities (ministries of customs and trade, and revenue authorities);
d. Regularly scheduled rail services connecting ICDs to seaports (railway authorities, ministry of transport).

As services around dry ports expand and evolve towards export processing and industrial parks, additional government involvement may be required for:

a) Appropriate land-use planning and zoning (ministry of planning);
b) Cost-effective and reliable energy supply (ministry of energy);
c) Cost-effective and reliable water supply (ministry of water/ public works);
d) ICT connectivity (ministry of communications, technology)

CHAPTER FIVE
SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

Therefore, based on the analysis and interpretations made at the pervious chapter the following summary, conclusions and recommendations were made.

Summary of the Findings

The demographic analysis regarding the age group indicated that, the highest number of respondents (30.8 in percent) were on the age group of 31-40 years followed by 20-30 and 41-50 with a percentage of (27.5%) and (20%) respectively in the study area. It was also necessary for studying the educational levels of the respondents. 46.7% of the participants of the respondents were diploma, degree, masters holders and above. On the other hand 25.8% and 14.2% of the respondents were illiterate.

As the finding of this study in its frequency indicates, out of 120 participants, 83 (69.2%) of them responded port warehouse construction were suitable for proper storage and handling of commodities in the study area by saying yes. On the other side, 37 (30.8 %) of respondents responded port warehouse construction were not suitable for proper storage and handling of commodities in the study area by saying no. 63 (52.5%) of respondents replied that outside premises were well drained by answering yes and 57 (47.5) of them responded no outside premises are not well drained. 76 (63.3%) of respondents answered that port warehouse structures are properly maintained to protect commodities in storage by responding yes. While the other 44 (36.7%) of the respondents replied that port warehouse structures were not properly maintained to protect commodities in storage by responding no. (42.5%) of the participants agreed that adjoining property or nearby water source does not constitute an undue physical hazard to commodities in store by responding yes, whereas 69 (57.5%) of the respondents responded that adjoining property or nearby water source constitute an undue physical hazard to commodities in store.

66 (55.0%) of respondents responded that port premises and grounds are free of weeds, clutter, trash, unused equipment, or spilled commodities by responding yes and 54 (65.5%)

of respondents responded that no port premises and grounds are not free of weeds, clutter, trash, unused equipment, or spilled commodities. On the availability of handling equipment for 20 foot and 40 foot containers, 54.2% and 45.8% of the respondents responded that handling equipment for 20 foot and 40 foot containers were available by saying yes. From the result obtained from the respondents 45.0% of them were said that there were availability of office for an operator and 55.0% of the respondents responded that there were no availability of office for an operator. In addition, 60.0% of the respondents responded that there were the availability of office for clearing and forwarding agents by responding yes while others 60.0% of them responded that there were no the availability of office for clearing and forwarding agents by responding no.

From the context of the availability of reliable & efficient communication facilities, 59.2% of the respondents answered that there were availability of reliable & efficient communication facilities while 40.8% of the respondents replied that there were no availability of reliable & efficient communication facilities. In addition 35.0% of the respondents responded that port areas were clean with a minimal accumulation of dust by arguing and saying yes. On the other hand 65.0% of the respondents responded that port areas were not clean with a minimal accumulation of dust. Based on the participants‟ response, the mean score on the respondent's response towards set consideration in the development of dry port plan was 3.92 SD 1.12. This indicated that the storage development conditions and item was high.

Based on the respondent's response, 48.3% of them argued that commodities were stored in an orderly manner. Whereas, 51.7% of the respondents responded that commodities were not stored in an orderly manner by saying no. Among 120 respondents whom answerd commodities in store were properly marked or identified by responding yes while 48.3% were disagreed by saying no, commodities in store were not properly marked or identified. 45.8% of the respondents responded that commodities were clean and protected from bird droppings, dust, filth, and stains by replied yes and 54.2% of the respondents responded that commodities were not clean and protected from bird droppings, dust, filth, and stains by saying no. Regardless of the usage of adequate and clean pallets, 70.0% of the respondents responded that adequate and clean pallets were used in the dry port storage. 66.7% of the

respondents responded that storage areas were kept dry by saying yes while 33.3% of them responded that storage areas were not kept dry.

Regarding to the cleanness of warehouse and the usage of proper housekeeping practices, 78.3% of the respondents responded that warehouse was clean and proper housekeeping practices were using by saying yes. On the other hand, 61.7% of the respondents replied that hazardous materials or contaminants were not stored near commodities by responding yes. 34.2% of the respondents responded that warehouse was free of objectionable odors by replied yes. To the reverse, 65.8% of the respondents responded that damaged or nonconforming products were not removed from the port storage areas. Finally, 46.7% of the participants or respondents responded that damaged or nonconforming products were removed from the port storage areas by saying yes and 53.3% of the participants or respondents responded that damaged or nonconforming products were removed from the port storage areas by saying no.

The mean score for over all respondent's response towards set consideration in the development of dry port plan was 3.92 SD 1.12. This indicated that the storage development conditions and item was high.

Conclusions

According to the finding of this research, warehouse constructions were suitable for proper storage and handling of commodities and outside premises were well drained. Correspondingly, port warehouse structures were properly maintained to protect commodities in storage and port premises and grounds were free of weeds, clutter, trash, unused equipment, or spilled commodities.

There were (availability of office for all users and reliable & efficient communication facilities). In addition, adequate and clean pallets were used in the dry port storage and storage areas were kept dry. Hazardous materials or contaminants were not stored near commodities. These enabled the dry port to be friendly with social, environmental, free from risk. So Dry Port construction and related facilities enabled to promote the surrounding communities taking sustainable development more seriously.

On the other hand, port areas were not suitable with a minimal accumulation of dust and warehouse was not free of objectionable usage which can create problems to the surroundings. In addition to this, commodities were not clean and protected from bird droppings, dust, filth, and stains. Apart from this, there was not availability of office for an operator in the dry port. This can't play a good role of dry port to the long-term development of Modjo town.

There are no national standards that can set and govern the land acquisition, design and construction of infrastructure needed to provide dry port basic services and basic infrastructure needs.

Recommendations

While initiatives in dry ports development may initially be championed by ministries responsible for transport infrastructure, long-term success will rely crucially on an integrated and comprehensive approach across ministries, as well as on the involvement of a number of stakeholders in the private sector as a team.

In addition, the team may wish to provide guidance with respect to the appropriate roles for national Governments, local governments and the private sector in development dry ports as growth centers, including how other ministries and institutions might be encouraged to become involved in exploring dry port issues further.

The ways that the secretariat, jointly with other development partners, could assist in devising policies on dry port development, including through analysis and sharing of "good practices", as well as potential pilot projects to be carried out with member countries.

Also from the observation very few manageable adverse impacts may occur such as car accidents due to the increase in the traffic volume in the local high way, crime and security problems, minor air and noise pollution and wastes generated during port operations and possibly a rise in the cost of living. However, the expected adverse effects are very marginal compared to the wider socio economic benefit that the country gains. They can also be mitigated by taking proactive measures.

In general assessed on the findings and conclusion of this research, the Research recommends that the following basic recommendations. These are:

- ✓ Modjo Dry port should redesign functionally by considering the proper facilities and services with in and around the Dry Port.
- ✓ The municipality of the town should revise the plan so as to align allocation of land with port activities and future growth opportunity of the town. An appropriate & sufficient space should be prepared for industries, real estate development, public services, business expansion and for residences Internal roads need to be constructed.
- ✓ Settlement of residents around the project area needs to be controlled
- ✓ Public services and utilities like schools, hospitals, housing, water and energy supply, transport, waste management etc needs to be improved.
- ✓ Government involvement is crucial to alleviate problems of local facilities that are beyond the capacity of the municipality. Particularly, development of housing, construction or up grading of the high ways passing through Modjo town, and availability of public transport requires huge fund and, hence, support from the government.
- ✓ All the necessary utilities like power, telecommunication facilities (broad-band internet services, wireless communication for internet connection, water supply, etc
- ✓ Modjo Dry Port Plan study has to be directed with consistent and acceptable manual considering the city or town that it built in.

Appendix I: English Questionnaire

Adama Science and Technology University

School of Civil Engineering and Architecture

Department of Architecture

Questionnaire for Households

Purpose:

Dear respondents,

The aim of this questionnaire is merely for academic purpose. The Research is going to conduct research on the Assesment of Dry Port Plan Integration in Town Development: A case of Modjo Town dwellers for the partial fulfillment of masters of Degree in Architecture to be awarded by the Adama Science and Technology University.

Since your contribution for the success of this research is significant or very essential for the Research as well as in facilitating the efforts to find solutions for problems on the Assesment of Dry Port Plan Integration in Town Development: A case of Modjo Town. Your response was keep as confidential.

The Research was like to thank you in advance for your genuine response for these questionnaires.

Notice:

- ✓ No need of writing your name.
- ✓ Please put **"√"** in the given provided box that best suits your answer.
- ✓ Please write short notes for open ended questions.

Contact Address:

Name: Tadele Moges

Phone: +251 911443265

Email: tadelest@gmail.com

Part I: Background of the Respondents

1. **Sex:** Male ☐ Female ☐
2. **Age:** From 20- 30 ☐ from 31- 40 ☐ from 41- 50 ☐ from 51-60 ☐ 61 and above ☐
3. **Marital status**: Single ☐ married ☐ Divorced ☐ widowed ☐
4. **Educational status:**

Illiterate ☐ reading and writing ☐ up to grade 12 ☐ Diploma, Degree, Master and above ☐

5. **Occupational category:**

Self Employed ☐ Civil Servant ☐ NGO /private company worker ☐

Part II. Port Development Checklist Item Requirement

No	Section 1. Port Development Checklist Item Requirement	Yes	No
1	Is port Warehouse construction suitable for proper storage and handling of commodities?		
2	Are outside premises are well drained?		
3	Do you think that port warehouse structures properly maintained to protect commodities in storage?		
4	Do adjoining property or nearby water source does not constitute an undue physical hazard to commodities in store?		
5	Do port premises and grounds are free of weeds, clutter, trash, unused equipment, or spilled commodities?		
6	Is there handling equipment for 20 foot and 40 foot containers available?		
7	Are there availability of office for an operator?		
8	Is there availability of office for clearing and forwarding agents?		
9	Is there availability of reliable & efficient communication facilities?		
10	Does container freight station with stuffing & unsnuffing service?		
11	Are port area are clean with a minimal accumulation of dust?		

Part III: Storage Development Conditions Checklist Items

No	SECTION 2: Storage Development Conditions Checklist Items	Yes	No
1	Do commodities stored in an orderly manner?		
2	Are commodities in store properly marked or identified?		
3	Do commodities are clean and protected from bird droppings, dust, filth, and stains?		
4	Are adequate and clean pallets used?		
5	Are storage areas kept dry?		
6	Are warehouse is clean and proper housekeeping practices used?		
7	Are hazardous materials or contaminants are not stored near commodities?		
8	Do warehouse is free of objectionable odors?		
9	Do damaged or nonconforming products are removed from the port storage areas?		

Thank you for cooperation!!!

Appendix IV: Amharic Questionnaire

የአዳማ ሳይንስና ቴክኖሎጅ ዩንቨርሲቲ

ስኩል ኦፍ ሲቪል ኢንጅነሪንግ ኤንድ አርኪቴክቸር

የአረክቴክቸር ትምህርት ክፍል

የድህረ ምረቃ ፕሮግራም

እኔ በአዳማ ሳይንስና ቴክኖሎጅ ዩንቨርሲቲ ሲቪል ኢንጅነሪንግ እና አርኪቴክቸር ትምህርት ቤት ውስጥ የአረክቴክቸር ትምህርት ክፍል የድህረ ምረቃ ፕሮግራም ተማሪ ስሆን የሞጆ ከተማን ከሞጆ ደረቅ ወደብ ፕላን ጋር መገምገም በሚል ርዕስ ጥናት ለማጥናት መረጃዎችን በማሰባሰብ ላይ እገኛለሁ። በዚህ ጥናት ላይ የዕርስዎ መረጃና አስተያየት ለጥናቱ መሳካት በእጅጉ አስፈላጊ ነው። ስለሆነም ያለዎትን እውቀትና ሀላፊነት በመጠቀም ሙያዊ አስተያየትዎትንና መረጃዎችን እንዲሰጡኝ እየጠየቅሁ የሚሰጡኝ ማንኛውም መረጃና አስተያየት ለጥናቱ አላማ ብቻ የሚውል ሲሆን ሚስጥራዊነቱ የተጠበቀ ነው። በመሆኑም የሚያውቁትንና የሚሰማዎትን ማንኛውንም መረጃና አስተያየት ነፃ ሆነው እንዲሰጡኝ እጠይቃለሁ።

ለሚያደርጉልኝ ትብብር ሁሉ በቅድሚያ አመሰግናለሁ።

ታደለ ሞገስ ታደሰ

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ኢሜል፡ tadelest@gmail.com

የአሞላል መመሪያ

- **ስም መጥቀስ አያስፈልግም።**
- **በእያንዳንዱ መጠይቅ ትይዩ የተሰማወትን ሀሳብ የ"√" በማድረግ ይመልሱ።**
- **ለተጨማሪ አስተያየተዎ እባክወን በመጨረሻው ገፅ ላይ ቁጥሩን በመግፍ ይጠቀሙ።**

የመጠይቅ ቁጥር———————————

ክፍል አንድ: የመላሾች የግል መረጃ

1. ጾታ: ወንድ ☐ ሴት ☐

2. **እድሜ:** ከ 20-30 አመት ☐ ከ31-40 አመት ☐ ከ 41-50 አመት ☐

ከ 51-60 አመት ☐ 61 እና ከዚያ በላይ ☐

3. **የጋብቻ ሁኔታ**: ያላገባ/ች ☐ ያገባ/ች ☐ የፈታ/ች ☐

4. **የት/ት ሁኔታ:** ያልተማረ/ች ☐ ማንበብና መጻፍ ☐ እስከ 12ኛ ክፍል ☐

ዲፕሎማ ፣ ዲግሪ፣ማስተርና ከዚያ በላይ ☐

5. **የስራ ሁኔታ:** በራሱ/ሷ የሚሰራ/ምትሰራ ☐ የመንግስት ሰራተኛ ☐የግል ድርጅት ሰራተኛ ☐

ክፍል ሁለት፡ ተርሚናል ልማት ቸክሊስት

ተ.ቁ	ተርሚናል ደቨሎፕመንት ቸክሊስት	አዎ	አይደለም
1	ለ 20 ጫማ እና 40 ጫማ ኮንቴይነሮች አያያዝ መሳሪያዎች አሉ?		
2	ለኦፕሬተር የቢሮ አቅርቦት አለ?		
3	ወኪሎችን ለማጥራት እና ለማንቀሳቀስ የቢሮ አቅርቦት አለ?		
4	በአቅራቢያው ያለው ንብረት ወይም በአቅራቢያው ያለው የውሃ ምንጭ በማከማቻ ውስጥ ባሉ ምርቶች ላይ አላስፈላጊ አካላዊ አደጋ አያስከትልም?		
5	ተርሚናል ግቢ እና ግቢ ከአረም፣ ከተዝረከረከ፣ ከቆሻሻ፣ ጥቅም ላይ ያልዋሉ መሳሪያዎች ወይም የተደፋ እቃዎች የጸዳ ናቸው?		
6	ለ 20 ጫማ እና 40 ጫማ ኮንቴይነሮች አያያዝ መሳሪያዎች አሉ?		
7	ለእንግዶች የተለያየ አገልግሎት አቅርቦት አለ?		
8	የማስተላለፊያ ወኪሎች የቢሮ አቅርቦት አለ?		
9	አስተማማኝ እና ቀልጣፋ የመገናኛ ተቋማት አለ?		
10	የኮንቴይነር ማመላለሻ ማደያ ከሸቀጣሸቀጥ እና ከሌሎች		

ተ.ቁ	ተርሚናል ደቨሎፕመንት ቸክሊስት	አዎ	አይደለም
	አገልግሎቶች አንዣር እንዴት ይታያል?		
11	የአገልግሎት መስጫ ቦታዎች ከአቧራ ክምችት ንጹህ ናቸው?		

ክፍል ሶስት: የማከመቻ ልማት ቸክሊስት

ተ.ቁ	የማከመቻ ልማት ቸክሊስት	አዎ	አይደለም
1	ሸቀጦች በሥርዓት ይከማቻሉ?		
2	በማከማቻ ውስጥ ያሉ ምርቶች በትክክል ምልክት የተደረገባቸው ወይም ተለይተው ይታወቃሉ?		
3	ሸቀጦች ንፁህ ናቸው እና ከአእዋፍ ጠብታ፣ አቧራ፣ ቆሻሻ እና እድፍ የተጠበቁ ናቸው?		
4	በቂ እና ንጹህ ፓሌቶች ጥቅም ላይ ይውላሉ?		
5	የማጠራቀሚያ ቦታዎች ደረቅ ናቸው?		
6	መጋዘን ንፁህ እና ትክክለኛ የቤት አያያዝ ልምዶች ጥቅም ላይ ይውላሉ?		
7	አደገኛ እቃዎች ወይም ብክለቶች ከሸቀጦች አጠገብ አይቀመጡም?		
8	መጋዘኑ ከሚቃወሙ ሽታዎች የጸዳ ነው?		
9	የተበላሹ ወይም ያልተስተካከሉ ምርቶች ከ ተርሚናል ማከማቻ ቦታዎች ይወገዳሉ?		

ስለትብብርዎ አመሰግናለሁ!!!

Appendix V: Interview Guide

Questionnaires related with the Assessment of Dry Port Plan Integration in Town Development: The Case of Modjo Town, Oromia National Regional State, Ethiopia.

1. Which existing dry port plans play with regard to the long-term development of local town;
2. Based on the assessment of the plan, are the surrounding communities taking sustainable development more seriously than others?
3. Are there design standards and guidelines for the dry port plan?

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