



SEEK WISDOM, ELEVATE YOUR INTELLECT AND SERVE HUMANITY!

Addis Ababa University  
አዲስ አበባ ዩኒቨርሲቲ



# **ASSESSMENT OF THE PERFORMANCE OF MULTIMODAL TRANSPORT SERVICE IN ETHIOPIAN SHIPPING & LOGISTICS SERVICE ENTERPIRSE**

**By: Selamawit Hailu**

**A Thesis submitted to Addis Ababa University School of Commerce in  
Partial Fulfillment of the Requirements for the Award of Master of Arts  
in Logistics and Supply Chain Management**

**June, 2017**

**ASSESSMENT OF THE PERFORMANCE OF MULTIMODAL TRANSPORT  
SERVICE IN ETHIOPIAN SHIPPING AND LOGISTIC SERVICES ENTERPRISE**

**By: SELAMAWIT HAILU**

**ADVISOR: MATIWOS ENSERMU (PhD)**

**A Thesis Submitted to Addis Ababa University School of Commerce  
Logistics and Supply Chain Management Graduate Program for the Partial  
Fulfillments of Masters of Art in Logistics and Supply Chain Management.**

**Addis Ababa  
June, 2017**

**ASSESSMENT OF THE PERFORMANCE OF MULTIMODAL TRANSPORT  
SERVICE IN ETHIOPIAN SHIPPING AND LOGISTICS SERVICE ENTERPRISE**

**By: SELAMAWIT HAILU**

**APPROVAL BY BOARD OF EXAMINERS**

---

**NAME OF ADVISOR**

---

**SIGNATURE**

---

**NAME OF INTERNAL EXAMINER**

---

**SIGNATURE**

---

**NAME OF EXTERNAL EXAMINER**

---

**SIGNATURE**

**STATEMENT OF CERTIFICATION**

This is to certify that Ms. Selamawit Hailu who carried out her research work on the topic entitled “**Assessment of the performance of Multimodal Transport Service in Ethiopian Shipping and Logistics Service Enterprise**” is her original works and is suitable for the submission for the award of Masters Degree in Logistics and Supply Chain Management.

Certified by:

Matiwos Ensermu (PhD)

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

## **STATEMENT OF DECLARATION**

I, Selamawit Hailu, hereby declare that this is originally produced by me with the guidance of Dr. Matiwos Ensermu. I confirm also that all the references of other people's work referred and the ideas adopted are fully acknowledged at reference sections. No part of this thesis has either been presented whole or in part to any other institutions for any award. I take full responsibility for any errors that may be included in this report.

---

Selamawit Hailu

# Table of Contents

CHAPTER ONE: INTRODUCTION.....	1
1.1 Background of the Study.....	1
1.2 Background of the organization .....	2
1.3 Statement of the Problem .....	5
1.4 Research Questions .....	8
1.5 Research Objectives .....	8
1.5.1 General Objective .....	8
1.5.2 The specific objectives .....	8
1.6 Significance of the study .....	9
1.7 Scope of the Study.....	9
1.8 Definition of Terms.....	10
1.9 Organization of the Thesis .....	11
CHAPTER TWO: REVIEW OF RELATED LITERATURE.....	12
2.1 Theoretical Literature Review.....	12
2.1.1 The Concept of Multimodal Transport.....	12
2.1.2 Benefits of Multimodal Transport .....	16
2.1.3 Limitation of Multimodal Transport System.....	19
2.1.4 Cargo Handling and Transfer .....	20
2.1.5 Changing in to Multimodal Transport System .....	20
2.1.6 Freight Transport Multimodal Development.....	21
2.1.7 Globalization & Competition .....	22
2.1.8 The concept and development of Multimodal Transport in Ethiopia.....	23
2.2 The Empirical Literature Review .....	26
2.3 Gap Analysis .....	27
2.4 Conceptual Framework from Different Literature .....	27
CHAPTER THREE: REASERCH DESIGN AND METHODLOGY .....	33
3.1 Description of the Study Area.....	33
3.2 Research Approach .....	33
3.3 Research Design.....	33
3.4 Population and Sampling Technique.....	34
3.4.1 Population.....	34
3.4.2 Sampling Technique .....	34

3.4.3 Sample Size .....	34
3.5 Data Sources and Tools.....	37
3.5.1 Data Sources .....	37
3.5.2 Data collection Tools.....	37
3.6 Data Collection Procedures.....	38
3.7 Method of Data Analysis.....	38
3.8 Ethical Consideration .....	38
CHAPTER FOUR: FINDINGS, DISCUSSIONS AND INTERPRETATION .....	39
4.1 General Overview of the Data.....	39
4.2 Measurement of Reliability and Validity .....	40
4.3 The Demographic Characteristics of Respondent’s .....	41
4.4 Analysis and discussion on the performance of multimodal transport Service .....	46
4.4.1 Custom Performance .....	46
4.4.2 Infrastructure Performance .....	49
4.4.3 Competence Performance.....	51
4.4.4 Timeliness Performance .....	52
4.4.5 Competition Performance.....	54
4.4.6 Tracking and Tracing Performance .....	55
CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS .....	57
5.1 Summary of findings.....	57
5.2 Conclusion.....	60
5.3 Recommendations .....	62
5.4 Limitations and direction for future study.....	63
REFERENCES .....	64
Appendix I: Questionnaire for Customers .....	i

## ACKNOWLEDGEMENTS

First of all, I would like to thank the Almighty GOD, for giving me the strength and tolerance to go through all the way to complete this document. My heartfelt thanks go to my husband Mr. Desalegn Bekele for his support in all regards.

My heartfelt gratitude goes to my Advisor Dr. Matiwos Ensermu, for his invaluable support and guidance. I thank him for sharing me his priceless time and for all his constructive comments and advice.

I would like to thank of my respondents, Ethiopian Shipping and Logistics Service Enterprise multimodal customer who volunteered to provide me vital information to prepare my thesis in its current form.

I appreciate the Management and Staff of Ethiopian Shipping and Logistics Services Enterprise for the provision of their vital information. Most importantly I appreciate Mr. Sintayehu Hailemariam, Mr. Tewodros Feleke and Miss Frehiwot Mulugeta (former staff of ESLSE), for their advice.

I also express my gratitude to the community of Addis Ababa University School of Commerce, particularly my fellow classmates especially Ms. Azeb Semahegn and Mr. Asfaw Tsegaye, for all the knowledge, experience and compassion you shared me.

## **Abstract**

*The Government of Ethiopia introduced multimodal transport system with the intention of providing seamless logistics services with reduced transaction cost. The reviews of literature show that the implementation of multimodal transport system in Ethiopia have been hindered by various problems. These problems include poor existing infrastructure and lack of basic infrastructures, congestion of dry ports, inefficient and ineffective freight vehicles, long and inefficient custom clearance process and lack of competition in multimodal transport. This study was made with the main objective of assessing the performance of multimodal transport service in Ethiopian Shipping and Logistics Services Enterprise in relation to time, cost effectiveness and reliability. Primary data were collected from 138 customers and two managements through interview. Out of the 138 questionnaires distributed all the 138 questionnaires were successfully returned back. Descriptive analysis method was used to calculate the outputs (i.e. mean and standard deviation) using the Statistical Package for Social Sciences. To assess the performance of multimodal transport service the performance measure were categorized in to six dimensions only for the purpose of this study. These are custom, infrastructure, competence, timelines and, competition and tracking and tracing. The findings of the research showed that the majority of customers were either disagreed or strongly disagreed with the many of performance indicator. Although the finding of the research indicated that the majority of the customers were agreed on the improvement of multimodal transport service during the past five years. Hence based on the findings of the research it is possible to conclude that inefficient custom clearance process, poor infrastructure, poor handling equipment and facilities in dry ports, inadequate port, terminal and warehouse spaces, shortage of truck, shortage of skilled manpower in logistic sector, cargo is not delivered as schedule or expected, lack of competitiveness in multimodal transport, tracking and tracing service not supported by automated or computerized system. These challenges were found to be sources of increased transit time, cost increment and unreliability. However, the enterprise has been taking stage by stage measures to upgrade the multimodal transport service quality. Therefore, the government has to invest on road, railway and dry port & terminal infrastructure and the enterprise has to equipped all the ports and terminals with modernized machineries and facilities in the future. The inland transport service should also be enhanced by acquiring latest fuel efficient and high volume vehicles. Upgrading employees professional qualification in logistic sector, create more awareness to customers to receive their cargo from the dry ports within the free time, running digital scanning machine for custom checking, computerized or automated tracking and tracing system benefits the multimodal transport in meeting efficient, cost effective and reliable service.*

**Key Words:** *Multimodal Transport, Dry Ports and Terminal, Multimodal transport operator, transit time*

## **LIST OF ACRONYMS AND ABBREVIATIONS**

<b>AACCSA:</b>	Addis Ababa Chamber of Commerce Sectoral Association
<b>B/L:</b>	Bill of Lading
<b>EDI:</b>	Electronic Data Interchange
<b>EMAA:</b>	Ethiopian Maritime Affairs Authority
<b>ESLSE:</b>	Ethiopian Shipping & Logistics Service Enterprise
<b>ICD:</b>	Inland Clearance Depots
<b>LPI:</b>	Logistics Performance Index
<b>MTO:</b>	Multimodal Transport Operator
<b>MTS:</b>	Multimodal Transport System
<b>SPSS:</b>	Statistical package for social science
<b>UNCTAD:</b>	United Nation Conference on Trade and Development
<b>WEF:</b>	World Economic Forum

## List of Tables

Table 2.1: Conventional Model Transport System .....	21
Table 2.2: Dry Port and Terminal Area and Carrying Capacity .....	25
Table 2.3: Infrastructure to Handle Container .....	29
Table 4.1: Number of Questionnaire Distributed and Collected .....	39
Table 4.2: Cronbach's Alpha Reliability Statistics .....	40
Table 4.3: Summary of Sex of Respondents .....	41
Table 4.4: Summary of Age of Respondents .....	41
Table 4.5: Summary of Respondents' Educational Background .....	42
Table 4.6: Summary of Respondents' Work Experience .....	42
Table 4.7: Summary of General Information of Respondents .....	43
Table 4.8: Summary of Respondents' by Sector .....	43
Table 4.9: Summary of Respondents' presentation of the Enterprise .....	44
Table 4.10: Summary of Respondents' Job Position .....	44
Table 4.11: Summary of Respondents' Foreign Trade Partners .....	45
Table 4.12: Summary of Respondents' general understanding & exposure to Multimodal implementation of Transport System in Ethiopia.....	45
Table 4.13: Summary of Respondents' evaluation of major change occurred in the past five years on the Multimodal Transport Service .....	46
Table 4.14: Descriptive Statistic Value of Custom Performance .....	47
Table 4.15: Descriptive Statistic Value of Infrastructure Performance .....	49
Table 4.16: Descriptive Statistic Value of Competence Performance .....	51
Table 4.17: Descriptive Statistic Value of Timeliness Performance .....	52
Table 4.18: Descriptive Statistic Value of Competition Performance .....	54
Table 4.19: Descriptive Statistic Value of Tracking and Tracing Performance .....	55

## List of Figure

Figure 1.1:	Multimodal Transport Department organizational Structure of Ethiopian Shipping and Logistics Service Enterprise .....	4
Figure 2.1:	Conceptual Framework .....	32

# CHAPTER ONE

## INTRODUCTION

This chapter mainly includes the background of the study, statement of the problem, research question, its objectives, significant and scope of the study, definition of terms and general framework of the study.

### 1.1 Background of the Study

The transportation system is one of the key drivers in trade logistics. In developed nations, businesses enjoy the best logistics and transportation professionals, systems, and infrastructure in the world. Transportation costs are higher when dealing with shipping materials over long distances in international trade (Wood, Donald F., Barone, Anthony P., Murphy, Paul R. and Wardlow, Daniel L., 2002).

The world of transport has changed considerably over the last few decades. International transportation of goods is increasingly carried out on a door-to-door basis, involving more than one mode of transportation. While there is little information on the overall proportion of cargo transported by multiple modes, data on the development of containerized traffic provide some highly significant indications, as containers are designed for transportation by different modes (UNCTAD, 2003).

According to Breda (2009), Multimodal transportation plays a significant role in modern international trade operations by enabling the multimodal transport operators to give efficient and effective integrated transportation services with minimum transport costs. In this case, shippers will be satisfied in supplying their goods with the lowest possible transportation cost and thereby the consignees will not face shortages of raw materials in manufacturing centers if it ensures early delivery. This scheme pools together one more modes of transport to render multimodal transport services via a single multimodal operator or multimodal service provider. Further the system avoids the involvement of more transport operators and helps shipper to enter a single transportation contractual agreement with the multimodal transport operator and receive a door to door cargo delivery service than port to port.

The introduction of multimodal transport in a country provides the opportunity to realize synergy from the potential improvements, which can be obtained from public and private interests: public administrations, state owned and private transport companies, importers and exporters (Ruth Banomyong, 2000).

Before the start of multimodal transportation system in Ethiopia, the transit transport system between Ethiopia and its transit countries, in particular Djibouti was uni-modal transport. This transport system makes Ethiopian importers to receive their imported goods at the port of Djibouti through their agents and Ethiopian exporters to send their cargoes to the port of Djibouti for being stuffed in containers at Djibouti Port (ESLSE unpublished report).

Currently containerization of the world trade is in the order of the day; just-in-time delivery of goods is the basis to satisfy customers; and hence the arrangement of multimodal transport is a recommended option (Chinniah Anbalagan and Kalimuthu Kanagara, 2014).

Therefore, this study intends to analyze the general performance of multimodal transportation in the case of Ethiopian shipping and logistics service enterprise based on empirical and statistical evidences.

## **1.2 Background of the organization**

To maintain the commendable economic growth that has been registered in the country over the last several years, one of the strategic measures taken by the Federal Government of Ethiopia is merging the former three public enterprises that have until recently been operating separately in a rather similar and interdependent maritime sub-sector; namely, Ethiopian Shipping Lines S.C, Maritime and Transit Services Enterprise and Dry Port Enterprise.

The Ethiopian Shipping and Logistics Services Enterprise (ESLSE) is the result of this merger. This newly amalgamated enterprise came into being following the issuance of Regulation by the Council of Ministers (Regulation No. 255/2011), and is vested with the huge responsibility of rendering sea-transport & logistics services to the country's importers, exporters, and investors in a more effective and efficient way, by reducing transit time, cost and handoffs. The new enterprise was reestablished as a public enterprise in 2011 with an authorized capital of ETB 3,760,000,000.00 of which ETB 940,799,000.00 was paid up in cash and in kind to give an efficient and integrated multimodal service to its customers being a single company.

Following the reestablishment proclamation, the newly merged company named as “Ethiopian Shipping and Logistics Services Enterprise (ESLSE)” and it has been nominated to function as a Multimodal Transport Operator.

Besides, a truck operating company named Comet Transport S.C. has recently been transferred to ESLSE following a government decree issued in the mid of 2014.

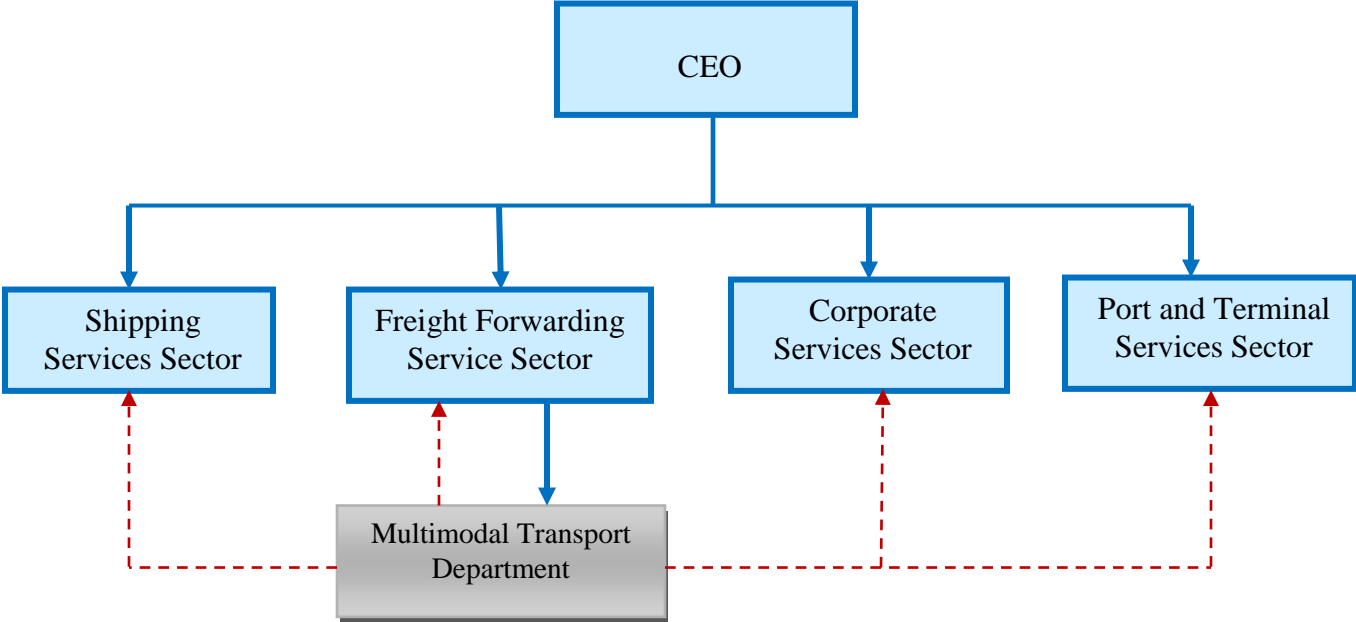
As set out in the regulation issued by the federal government of Ethiopia in 2011 (Regulation No. 255/2011), the objectives for which the ESLSE is established are:

- To render coastal and international marine and inland water transport services.
- To render freight forwarding agency, multimodal transport, shipping agency and air agency services.
- To provide the services of stevedore, shore-handling, dry-port, warehousing and other logistics services;
- To provide container terminal services.
- To engage in the development, management and operation of ports.
- To establish and run human resources development and training center in the fields of maritime profession.
- To study the country’s import and export trade demand and thereby develop technological capacity in order to render maritime and transit transport services.
- To engage in other related activities conducive to the achievement of its objectives.

ESLSE has a multitude of vessels, heavy duty trucks, sea and dry port facilities, chicaneries, etc that enable it render efficient sea and land transport services as well as sea and dry port services.

ESLSE has its headquarters located in the heart of Addis Ababa, Ethiopia, with main branches at Djibouti, Modjo, and Kality (the former Comet) and other branches in Mekelle, Dire Dawa, Kombolcha, Semera and Gelan towns. It also has a Maritime Training Institute at Babogaya in Bishoftu (former Debrezeit) Town.

Figure 1.1: Multimodal Transport Department organizational Structure of Ethiopian Shipping and Logistics Service Enterprise



Source: Enterprise's Report

### **1.3 Statement of the Problem**

In international trade, multimodal transport has been identified as an efficient way of transporting international cargo. In this system of transportation, one transport document, one tariff rate and a single through-liability are applied. The principal aim of multimodal transport is to make the movement of goods from seller to buyer more efficient, through faster transit times and reduced costs. During multimodal transportation, the responsibility and liability is concentrated in one entity known as the multimodal transport operator (MTO), who organizes all transport systems in the transport chain between countries.

Ethiopia being one of the developing countries needs to be integrated with global economy and that can only be possible through efficient and effective flows of goods to and from the country in international trade. To this end, the country needs to adopt or develop an efficient multimodal transport system for freight transport. With the aim of improving the flow of goods between Djibouti port and dry ports in Ethiopia, Ethiopia implemented “multimodal” transport system since January 2011. The directive set by the government of Ethiopia indicated that “multimodal” transport system in Ethiopia targets for seamless, low cost, and maximum customer convenient transporting of imported goods from Djibouti to dry ports in Ethiopia and the reverse flow in case of exported goods.

According to Breda (2009), multimodal transport is able to generate practical benefits by saving goods transit time, transportation costs, the environment from pollution by incorporating less polluting modes of transport in to the transport chain. He also emphasizes that it can help to increase productiveness and effectiveness of freight transport industry as a whole. Since effective multimodal transport ensures the use of the most efficient mode of transport at each stage and that ultimately reduces congestion, energy expenditure and pollution dramatically. The multimodal transport service was commenced in 2011 as a new transport system to the Ethiopian foreign trade system, since it is very costly to continue being dependent only on unimodal transport system.

Thus success in transport sector needs the development of infrastructural facilities which helps to render efficient and effective transportation service. Transportation infrastructure development is the main task to be done by governments. Countries which have been already developed their

infrastructural facilities have managed to provide modern transportation and communication services with minimum cost and service time with noticeable differences in international business arena.

The contribution of transport and communication sectors to the country's GDP is still less than 10 percent while the government is investing a huge amount of birr to scale up the infrastructural facilities development in the sector (CSA, 2007). Development in transport and communication sector will have a substantial impact on logistics activities and ultimately fosters international trade that brings economic development to the country. More is expected from the sector to ensure a sustainable economic development that eventually make realized the country's vision of being a middle income country by the year 2025 (UNDP, 2012; MoFED, 2013; Debela, 2013).

The infrastructural development in transport and communication sectors seem stagnated in the past decades and its continued stagnation is manifested by the poor logistics facilities we have. This infrastructural status cannot encourage transport service providers to invest in the sector and give time and cost efficient services. Poor networks of road, poor telecom facilities, interrupted energy supply and unavailability of qualified experts and lack of commitment from government side all have played their role to worsen the quality of the logistics sector. The real feature of Ethiopian logistics system has been precisely described by Debela (2013) in his research work, from the assessment made about Logistics Practice in Ethiopia and his concluding statement directly quoted as below:

*“Ethiopian logistics system is characterized by poor logistics management system and lack of coordination of goods transport, low level of development of logistics infrastructure and inadequate fleets of freight vehicles in number and age, damage and quality deterioration of goods while handling, transporting and in storage. This coupled with lack of sea port resulted in poor linkage of producers (farmers) to the consumers (market) and non-competitiveness of Ethiopian goods on global market, which compromised livelihood of the people and economy of the country. There is a very high rate of traffic accident (first in the world) and congestion in cities and at city inlets/outlets to which freight vehicles contribute significantly He recommended that efficient and effective logistics system needs to be put in place to solve the socio-economic problems and there is an urgent need for research on the logistics gap identified, and human resource needs in freight transport and logistics needs of the country”*

On the other hand, there is also indicator of Multimodal Transport service inefficiencies as study shown, as per the report of World Bank (2013), the World Bank Logistics Performance Index (LPI) provides a comprehensive measure of the state of trade logistics in a country facilitates comparisons with other countries, Ethiopia ranks at the lower end of the surveyed countries, 141 out of 155 countries in 2012. It is not only below the average for sub-Saharan Africa in all the six key dimensions of logistics performance measure (Customs, Infrastructure, International Shipments, Logistics Competence, Tracing & Tracking and Timelines), but also lags behind in the direct comparison with neighboring Kenya and Tanzania. As per the findings of the World Bank, Ethiopia ranked at the lower position in relation to efficiency of custom clearance process, quality of trade and transport related infrastructure, providing competitive prices, competence, ability to track and trace consignment, frequency with which shipment reach consignee within scheduled or expected time.

Moreover, problem following the commencement of the multimodal transport service is congestion of dry ports since the numbers of incoming containers surpass the outgoing ones. Local importers who have been complaining that their goods were stacked at the Port for more than eight months were not present to collect their goods, except few companies, after repeated notices were given (Capital, 2012).

To end up the inefficient performance of international freight transport system, much is expected from the sector to introduce a very efficient means of freight transport system that would enhance the development of the country's import export business.

Therefore, this research study will be carried out to assess the performance of multimodal transport service in Ethiopian Shipping and Logistics Service Enterprise.

## **1.4 Research Questions**

This study attempted to answer the following research questions:

- How ESLSE provide efficient, effective and reliable multimodal transport service to its customers?
- How multimodal transport service supported by modern technology to provide efficient service and to enable its customers to track and trace their consignment.
- How the management and employee in ESLSE have the competence to provide efficient multimodal transport service?
- How the country transport related infrastructures suitable to provide optimal multimodal transport service?
- How the customs clearance process suitable to deliver efficient multimodal transport service?

## **1.5 Research Objectives**

### **1.5.1 General Objective**

The main objective of this study was to assess the performance of multimodal transport service; with respect to time, cost effectiveness and reliability in Ethiopian Shipping & Logistics Services Enterprise.

### **1.5.2 The specific objectives**

- To check the implementation of modern technology in order to track and trace consignment;
- To assess the contribution of transport related infrastructures to the performance of multimodal service;
- To examine the efficiency of custom clearance process to the performance of multimodal transport service.

- To analyze and identify the existing challenges in the service delivery of multimodal transport.
- And finally, to evolve strategies for ESLSE that would help to provide efficient multimodal transport service.

### **1.6 Significance of the study**

First and for most the study benefits Ethiopia Shipping and Logistics Service Enterprise in the following aspects:-

- It helps the enterprise to examine service delivery performance of Multimodal transport System.
- It articulates the problem sits customers face in getting service from the multimodal transportation system and it recommends for possible solutions for the improvement of its service.
- Moreover, provides important inputs to formulate effective Multimodal Transport System.

### **1.7 Scope of the Study**

This study focused on the assessment of the performance of multimodal transport system in Ethiopia taking Ethiopian Shipping and Logistics Services Enterprise as a case.

Naturally the research topic is vast in its scope. Despite the time and budget constraint the study focused only on the import side of containerized cargo of multimodal transport system and thus the researcher was not cover export side of multimodal transport system.

This study was limited in constructing and taking population size i.e. only considering multimodal transport service customers and managements from ESLSE who are directly involved in Multimodal transport system.

## 1.8 Definition of Terms

The terms ‘Through Transport’, ‘Combined Transport’, ‘Intermodal Transport’ and ‘Multimodal Transport’ are all used in the context of cargo movement, from origin to destination. These four terms have very similar meanings, i.e. the transportation of goods by more than one mode of transport and a through freight rate. However, the United Nations made a distinction between each term and introduced definitions of transportation terminology in their *Multimodal Transport Handbook* (1995):

**Modes of Transport:** The method of transport used for the movement of goods, e.g. by rail, road, sea or air.

**Means of Transport:** The vehicle used for transport, e.g. ship, truck, or aircraft.

**Types of Means of Transport:** The type of vehicle used in the transport process, e.g. wide-body, tank truck, passenger vessel, etc.

**Unimodal Transport:** The transport by one mode of transport only, where each carrier issues his own transport document (B/L, Airwaybill, consignment note, etc.).

**Combined Transport :** The transportation of goods in one and the same loading unit or vehicle by a combination of road, rail, and inland waterway modes.

**Intermodal Transport:** The transportation of goods by several modes of transport where one carrier organizes the whole transport from one point or port of origin via one or more interface points to a final port or point. Depending on how responsibility for the entire transport is shared, different types of documents are used. There are also different definitions for intermodal transport. The ECMT (European Conference of Ministers of Transport) and the European Committee for standardization (CEN) use the following definition for intermodal transport: “the movement of goods in one and the same loading unit or vehicle which uses successively several modes of transport without handling of the goods themselves in changing mode”. The EC definition goes beyond the ECMT/CEN definition, and corresponds with the ECMT/CEN definition of multimodal transport: “the movement of goods whereby at least two different modes are used in a door-to-door transport chain”. For Mahoney (1986), “Intermodality” means

the movement of freight via two or more dissimilar means of modes of transportation while for Hayuth (1987), “Intermodality” means the movement of cargo from shipper to consignee by at least two different modes of transport under a single rate, through-billing, and through liability. The term “intermodality” has been widely adopted by European Union policy-makers.

**Multimodal Transport:** Where the carrier organizing the transport takes responsibility for the entire door-to-door transport and issues a multimodal transport document.

Multimodal transport is therefore a concept which places the responsibility for transport activities under one operator, who then manages and coordinates the total task from the shipper’s door to the consignee’s door, ensuring the continuous movement of the goods along the best route, by the most efficient and, cost-effective means, to meet the shippers requirements of delivery. This means simplified documentation, and increasingly by electronic means such as electronic data interchange (EDI).

## **1.9 Organization of the Thesis**

This study consists of five chapters. The first chapter contains introduction of the study whereby background of the study, background of the organization, problem statement, research questions, objectives of the study, and significance of the study and scope of the study explained. In Chapter Two both the theoretical framework and empirical evidences was discussed in detailed manner so that based on the facts addressed, the conceptual framework of the study was developed and illustrated. The third chapter deals with research design & methodology to be used in the study together with ethical consideration. In Chapter Four findings, discussions and respective interpretation was discussed. And finally in Chapter Five conclusions and recommendations together with limitation and direction for future study was presented.

## **CHAPTER TWO**

### **REVIEW OF RELATED LITERATURE**

The literature review part of this study has theoretical literature review and empirical literature review parts. The theoretical part presents the summary of theories forwarded by different scholars pertaining to the subject under study at different times. Whereas the empirical part contains summary of similar or related research findings obtained from other earlier researches.

#### **2.1 Theoretical Literature Review**

The availability of an efficient transport system in a country or region is a catalyst for its economic growth (Hayuth, 1987). The service quality of transport means affects transport and logistics related costs and also influences the demand for products (Coyle *et al.*, 1996). The demand for increased productivity and efficiency of the transport industry has been heightened as the manufacturing and service sectors adopt such logistics concepts as "just-in-time" delivery and supply chain integration, and by the shift towards a global economy, competition between supply chain versus supply chain (instead of company versus company), e-business and e-commerce. In such a situation mode-specific segmental approaches are no longer able to meet effectively the needs of shippers and manufacturers (OECD, 2001). Containerization involves improving the quality of handling and transfer of general cargo in transit moving by road, rail or ship, but multimodalism integrates the modal transport function under one operator from factory door to factory door.

##### **2.1.1 The Concept of Multimodal Transport**

The 'Multimodal Transport' concept can be defined as the combination of various types of transport modes used in a national or international transport operation, in which provides door-to-door services, under the responsibility of one single transport operator (UNCTAD, 1995; 2001). Practically, this particular concept is not new and may even have been practiced long before the introduction of this terminology. According to Woxenius (1998), the early form of combining transport modes dates back to Roman times where horses and carriages were the

primary form of interchangeable transport modes. An effort of introducing adequate legal framework for Multimodal Transport operation was found in the work of ‘International Code of Affreightment’ in the early 1910s. However, during that time, transportation was considered as a segmented industry based on unimodal operation and contracts. It was not until the introduction of large-scale containerization in the 1970s, did Multimodal Transport gain considerable momentum (Faust, 1985). According to Muller (1995), only 1% of world containerized cargo was moved intermodally under a through bill of lading in 1979. Today, most containerized cargo does.

Until the introduction of containerization in the 1960s, physical movement of goods had been through evolutionary changes of innovation in an attempt to achieve efficiency and effectiveness (Hayuth, 1987). However, based on the emergence of driving forces such as technology, economy, regulation, social environment and business competitiveness, the complexity of transport operations has driven the need to introduce a more structured concept. This in turn brought with it a terminology which would encapsulate the key considerations of transport practices and which would be agreed upon at an international level (Hayuth, 1987; UNCTAD, 1993). As a component of international trade, Multimodal Transport has generated considerable commercial values for shippers in comparison to other alternative transport systems. According to Campisi and Gastaldi (1996), Banomyong (2000), SLA (2008), and Islam, et al. (2008), some of its many advantages are:

- Reduction of time, risk of lost or damaged goods through a planned and coordinated single transport operation,
- The establishment of a seamless communication link maintained by single Multimodal Transport Operator,
- Increase market access opportunity through speedy transfer and transit time,
- Reduction of multiple documentation,
- Cost saving through possible reduction of freight rate,
- Minimizing confusion through a single point of contact (the Multimodal Transport Operator),
- Ultimately, an improvement in the competitive position of companies in the international market place,
- Different solutions can be easily benchmarked for performance,

- and Reduction in energy used, thus provides environmental and social benefits.

According to these inherent benefits, it is clear that Multimodal Transport has the potential in providing numerous commercial advantages for shippers, consignees and freight forwarders. Needless to say, it is an integrating tool in offering shippers a great choice of cost control, flexibility, competition, reliability and a one-stop service (Islam, *et al.*, 2005). The distinguished features of the Multimodal Transport concept are: combination of various types of transport modes, international transport operation and responsibility of one single operator.

The idea of multimodal transport is that a product is brought from the door of its origin, the manufacturer, to the door of its destination, the end user, by making use of at least two modes of transport, which is also commonly known as the door-to-door service. It is containerization in the shipping industry that has made the door-to-door transport a widespread practice in today's transport field. The multimodal system is 'an optimization process of the location, movement and storage of resources from the point of origin, through various economic activities, to the final consumer'. (Alderton, 1995). In accordance with the United Nations Convention on International Multimodal Transport of Goods, "international multimodal transport" is defined (in Article 1) as 'the carriage of goods by at least two different modes of transport on the basis of a multimodal transport contract from a place in one country at which the goods are taken in charge by the multimodal transport operator to a place designated for delivery situated in a different country. The operations of pick-up and delivery of goods carried out in the performance of a unimodal transport contract, as defined in such contract, shall not be considered as international multimodal transport.' As a modern efficient organization mode of transport, multimodal transport is characterized with one striking feature of 'one charge, one document, and entire trip liability' (Sino-Dutch Joint Committee, 1998). A multimodal transport operator is responsible for the fulfillment of the multimodal transport contract and charges the shipper only once for the freight of the entire trip. Only one contract of carriage, a multimodal transport document, is used for the entire trip. From the above-mentioned definition, it can be inferred that multimodal transport is characterized by the following facts (Guibin, 1999):

- **It is a Service Activity**, which refers to the carriage of goods under a transport contract between the multimodal transport operator (the MTO) and its client;

- **It is a Commercial Activity**, which should be performed by qualified international transport operators and which, therefore, requires a legal framework to ensure minimum standards in the provision of services and some protection of the interests of the various commercial parties involved;
- **It is an International Activity**, by which goods pass from one country to another and use various transportation modes, involving different fiscal regimes and responsibility regimes, which must be harmonized.

Multimodal transport is a service innovation by which the MTO assumes a contractual responsibility to move goods from a point of origin to a destination under a transport contract, for an agreed price with a time-limit for the delivery. This service innovation ensures that the goods will move to their destination as fast and securely as possible, at a cost known in advance. This further reveals the following features of multimodal transport, which might be the most striking ones (UNCTAD Secretariat, 1994b).

- (i) **Reduced Door-to-door Transport Time.** By multimodal transport, transport operations are always carried out at a faster speed, which reduces the total transit time. One of the major reasons for this is that since there is only one operator, i.e. MTO, in charge of the whole transport, he is capable of intercepting the cargo whenever there is a change of mode and ensuring that this change is affected without delay. There is also another reason which might account for the fastest possible delivery by the MTO. He wants the container to come back as soon as possible after the delivery of cargo so that he can have a higher utilization ratio of the container and eventually earn more freight (UNCTAD, 1997).
- (ii) **Cost-effectiveness.** By utilizing multimodal transport, both MTOs and shippers will be able to have an idea about the total transport cost before the transport actually commences. This will ensure an effective control of transport cost. The reduction of transit time by multimodal transport will also lead to a reduction of financing costs, simply because the interest payment period will be made shorter after the transit time is shorter (Guibin, 1999).
- (iii) **Reliability.** Since being closely controlled by a single operator, i.e. MTO, seamless transport is guaranteed at each stage of the multimodal chain. The transport process is thus made more

reliable. As a result, breakdowns in the supply or distribution process are reduced to a great extent, which will lessen the need for safety or buffer stocks for shippers or consignees (UNCTAD Secretariat, 1994b). In order to eliminate the possible confusions which might occur when considering the transport of goods on one document by more than one mode of transport, it is necessary to distinguish between multimodal transport and the various types of transport as follows (UNCTAD, 1995):

**MULTIMODAL TRANSPORT:** if the carrier that organizes the transport takes the responsibility for the entire transport, he issues a multimodal transport document.

**SEGMENTED TRANSPORT:** if the carrier that organizes the transport only takes responsibility for the portion he is performing himself, he may issue an intermodal bill of lading.

**UNIMODAL TRANSPORT:** is the transport of goods by one mode of transport by one or more carriers. If there is only one carrier, he issues his own transport document, e.g. a bill of lading, an air waybill, a consignment note, etc. If there are more than one carrier, for example, carriage from one port via another port to a third port with transshipment at an intermediate port, one of the carriers may issue a “through bill of lading” covering the entire transport. Depending on the back clauses of this through bill of lading the issuing carrier may be responsible for the entire port-to-port transport or for only that part which takes place on board his own vessel.

**COMBINED TRANSPORT:** is the transport of goods in one and the same loading unit or vehicle by a combination of road, rail and inland waterway modes.

**INTERMODAL TRANSPORT:** is the transport of goods by several modes of transport from one point or port of origin via one or more interface points to a final port or point where one of the carriers organizes the whole transport. Depending on how the responsibility for the entire transport is shared, different types of transport documents are issued (Castro, 1996).

### **2.1.2 Benefits of Multimodal Transport**

The cost and quality of transport services will have considerable impact on the development of national production as well as foreign trade activities. With the introduction of multimodal

transport, the transport industry has been experiencing a revolutionary phase both in cost savings and service quality upgrading. An effective multimodal transport system will bring short-term benefits to local traders and transport operators, as well as longer-term consequences in the structural changes of a country's transport and international trade development. There are three key players involved in the multimodal transport operation, viz. service providers, transport users and the Government (Guibin, 1999).

Service providers, including modal carriers, freight forwarders, MTOs, banking institutions, insurance companies and so on, can offer market-oriented MT operations within the framework of national and international trade and transport practices. Transport users, including importers and exporters, can take advantage of MT operations in their international trade transactions. The Government designs and implements national laws and regulations regarding trade and transport (Guibin, 1999).

### **2.1.2.1 Short-term Benefits**

#### **For service providers**

Service providers could gain benefits from multimodal transport as follows (UNCTAD, 1994b):

- Boosting their profession as international transport operators (especially for freight forwarders becoming MTOs);
- Increasing their local market shares and opening new markets overseas;
- Increasing their financial liquidity through the collection of prepaid freight on containerized door-to-door transport contracts, providing them with key financial leverage and with the possibility of sub-contracting shipping, railway and truck space at competitive rates while controlling sub-contractors' payment schedules;
- Commercial incentives to adapt to transport-related technologies, such as containerization and EDI (Vanroye & Blonk, 1998);
- The need to reconsider their marketing strategies and, for example, concentrate their activities in "niche" operations to serve specific commodities on specific trade routes (Mentzer, 1997).

### **For transport users**

Transport users can expect economic and financial benefits from the multimodal transport in the form of (UNCTAD, 1994b):

- Reduced transit time; punctuality; and increased cargo security, particularly at interface points (Hayuth, 1987);
- Reduced transport costs (e.g. from negotiated volume rates) and other associated costs (resulting from the use of modern transport-related technologies: containers, EDI, computerized cargo-tracking systems, etc.);
- Pre-agreed price for the door-to-door transport operation;
- Closer commercial relationships with services providers;
- New trading opportunities from non-traditional exports, under the stimulus of improved transport services.

### **For Governments**

Governments can also benefit from the MT approach since it offers the opportunity to streamline and update trade-and transport-related administrative procedures and regulations. It also stimulates trade, promotes new activities for the country's transport sector and saves on hard currency, thus improving the country's balance of payment. Governments can stimulate innovative solutions from trade and transport partners and can promote fundamental changes in existing practices. The MT approach can also strengthen the complementarity between transport modes, instead of creating competition (UNCTAD Secretariat, 1994b).

#### **2.1.2.2 Long-term Consequences**

### **For service providers**

In order to maintain their competitiveness and also under the customers' pressure, transport operators will have to restructure their operations, taking advantage, among other things, of joint-ventures with foreign partners. They will increasingly try to differentiate their services in an effort to gain a competitive market advantage. By offering a greater choice of available value-added services for potential transport users, they may be able to grasp larger market shares and increase their profits (UNCTAD Secretariat, 1994b).

### **For transport users**

In the longer term, as reliable and efficient MT services develop, transport users will be able to look into the reorganization of their distribution outlets. This can already be seen in some regions of the world where the simplification of border crossings and the harmonization of transport policies have fostered the development of new forms of logistics operations for example, networks of logistics hubs and alliances to make modal operations more efficient (UNCTAD Secretariat, 1994b).

### **For Governments**

Governments will have to plan infrastructure developments and to design institutional organizations with increased attention to the needs of the transport industry so as to serve the national economy more effectively. With regard to regulatory measures, they should be adopted to harmonize transport liability regimes and insurance practices, and to provide an appropriate legal framework for the establishment and development of MTOs. Trade and transport facilitation measures and their acceptance by the trading community, transport operators, government agencies, banks and insurance companies also need to be taken into account, such as Customs regulations, trade and transport documentation, EDI technology, etc.). Governments need to develop policy measures to ensure the smooth development of Customs and transport operations/services and to avoid misallocation of resources (UNCTAD Secretariat, 1994b).

Human resource development measures also need to be taken to secure the adequate training of nationals from both public and private sectors to improve management of transport operations and reorganization of transport enterprises (UNCTAD Secretariat, 1994b).

#### **2.1.3 Limitation of Multimodal Transport System**

As with other systems international multimodal transport systems are limited in their application. For example, all goods are not technically and economically transferable from road to this system (Burkhardt, 1998). A study performed by A. T. Kearney of Brussels found that long-distance routes with high traffic volumes have the biggest potential for multimodal transport (ECMT, 1998). Moreover it requires transfer of goods from one mode to another in seaports and multimodal terminals. Containerized ports and special terminals with back-up facilities and skilled manpower are essential to perform such transfers. So, multimodal freight transportation is

capital intensive and less skilled labour intensive than traditional freight handling methods (Muller, 1999).

Another important limitation of multimodal transport is the lack of willingness to co-operate and co-ordinate among the carriers of different mode. Success is highly dependent on, among others, the higher degree of co-operation and co-ordination among parties concern. But in the competitive market the reality is such that 'when one carrier can transport the commodity the entire distance over its own lines, the carrier is hesitant to co-ordinate with other carrier' (Coyle *et al.*, 1996).

#### **2.1.4 Cargo Handling and Transfer**

Until containerization was achieved, cargo handling, whether in factory, warehouse or in transit, was labour intensive, costly, time consuming and above all prone to damage, delay or loss, including pilferage. One of the important objectives of containerization was to protect cargo from loss, damage and delay. For the first time the transport of raw materials, intermediate or finished products was viewed as part of an integrated material handling operation and the industry think-tank understood the potential for improving productivity by investment in technology (Stopford, 1997). Return on capital is always a crucial issue for any investment decision. This is even more important in investment in ports and terminals where it is termed a 'sunk investment'. Containerization has opened the door to port and route choice. So, strong competition amongst ports and terminals has resulted in the concept of the hub and spoke port systems, and ports are under tremendous pressure to upgrade and expand facilities with such items as modem gantry cranes and require extensive back-up land (Eno Transportation Foundation, Inc., 1999).

#### **2.1.5 Changing in to Multimodal Transport System**

As per Hayuth, (1987), Spatial, Technological and Organizational changes have affected all three components of the international freight transport system including inland transport involving pick-up and delivery at both ends of the journey, ports and terminals, and maritime or air transport. A conventional modal transport system can be transformed into a multimodal transport through the three types of change summarized in the Table 2.1.

**Table 2.1: Conventional Modal Transport System**

Type of Change	Seaport/ Terminal	Inland Transport	Maritime Transport
Spatial	Extension of hinterland, new terminal with backup land, ship-to-shore to-inland transport accessibility, ICDs	Operation beyond seaports, change of traditional trade centers, door-to-door service	Operation beyond seaports, variety of routes and port of call
Technological	Gantry crane, straddle carrier, computerized terminal operation, EDI facility, reduced labour & new skill.	Specialized, large, high speed carriers, & new skill	Specialized, large, & high speed vessel/carrier, skilled and reduced manning
Organizational	CPS service, through rate scheme, logistics concepts, involved in inland transport, port marketing.	Innovative logistics management, CPS service, through-rates.	Innovative logistics management, landside transport management, through-rates.

Source: Hayuth, (1987)

### 2.1.6 Freight Transport Multimodal Development

During the last half century the maritime transport system has experienced rapid changes (Hayuth, 1987), which can be classified into two broad categories: evolution in the growth of ship and port size, and revolution in the system of linkages. The first revolution was in the ship-to-shore transfer i.e. containerization; the second was in the ship-to-rail transfer i.e. intermodal (or multimodal) revolution (Ashar, 1999). The practice of using more than one mode of transport in a coordinated and seamless way can be termed as multimodal transport (D'Este, 1996).

Freight transport multimodal development requires, apart from operational and infrastructural features, a conducive administration and legal environment, and efficient interchange of information (D'Este, 1996). Developing such an integrated transport system is challenging in particular in developing countries. The challenges can be categorized and discussed in six major areas: globalization of trade and investment, the role of government, new technology and

methodology, standardization, changes in logistics concepts and changes in the inland transport system (Islam and Gray, 2003).

### **2.1.7 Globalization & Competition**

Globalization, among other factors, has forced as well as enabled companies to be competitive, extend markets and get supplies from worldwide sources (Zeng and Rossetti, 2003). Globalization focuses on achieving 'one village' i.e. a border-less world in terms of trade and investment (Zinn, 1999) and has extended its arena by including the flow of information as well. Today successful multinational companies develop their products in the U.S. and Europe and manufacture them in developing countries and then sell them worldwide (Zeng and Rossetti, 2003). Thus, globalization has had a great impact on Freight transport systems, because international trade, financial flows, foreign direct investment (FDI) and other forms of trans-border linkages among private firms have become the main features of globalization (UNCTAD, 2000a).

The argument for free trade was based on the considerations of specialization and international division of labour (Foster, 2003). In contrast, geographical and institutional divisions affect the construction of infrastructure, availability of transport networks and options, the operation of the transport service and thereby its quality (Rejmaud, 1998). These features can measure the level or degree of attachment of any country to the global village. Because of a dependence on global production and consumption as well as global competitiveness, trading companies are constrained in terms of transport by factors such as transit time, transport cost and costs from loss, damage and delay. The cost of transport is generally relatively higher in developing countries (UNCTAD, 1994b; Roberts, 2004).

Industries in developing countries have to operate with highly inefficient transport systems and thereby lowering the competitiveness of their products in the global market (Gulyani, 2001; ADB, 2003). Nevertheless, globalization has increased prosperity and the potential for developing countries. At the same time it has raised the risk of marginalization. Asymmetries and imbalances in the international economy have been intensified (UNCTAD, 2000b).

### **2.1.8 The concept and development of Multimodal Transport in Ethiopia**

The Multimodal Transport system has been introduced in Ethiopia since 2007 for containerized and Ro/Ro cargo of up to 3 tones carried by ESLSE. Multimodal transport system in Ethiopia is intended to provide an integrated transport services by streamlining sea and land legs of operation on end –to-end basis and facilitate expeditious transfer of goods through the port for delivery at inland destinations. Early on, the service was started on small scale basis focusing only on government containerized and Ro/Ro cargos (EMAA, 2014).

The Ministry of Transport ordered beginning of 2012 all import of the country (Under Letter of Credit) to be handled on Multimodal Transport and by the sole operator, ESLSE. Thus, the service has been scaled up to apply for all imports including government and private companies alike. The system is 100% under the control of the Ethiopian government.

According to Fortune (2011), the multimodal transport system was introduced with the aim of easily moving freight from port Djibouti on time. The system was started after the issuance of Multimodal Transport Implementation Directive on July 2010. According to the source, the directive defined the multimodal transport system as “a system where by transportation of goods is under a single contract but performed by more than two means of transportation; the carrier is liable for the entire journey including the shipment’s delivery at final destination; the transportation can be made by sea, rail, and trucks (roads)”.

Fortune (2011) stated that the directive made all shipments that belong to government to be transported through Ethiopian Shipping and Logistics Service Enterprise (ESLSE) and to be delivered to dry ports and warehouses authorized by Ethiopian Revenue and Custom Authority (ERCA).

On the other hand, ESLSE performance on multimodal system is not encouraging so far. Sources indicated that the system is inefficient and ineffective yet. Report by Addis Ababa Chamber of Commerce and Sector Association (AACCSA, 2012) indicated that many businesspersons spoke their frustration with the multimodal transport of goods service by ESLSE. According to AACCSA (2012), on business luncheon on December 31, 2012, at Hilton Hotel, many businesspersons spoke furiously on the problem of multimodal freight transport system in

Ethiopia. According to the report by AACCSA (2012), many businesspersons believe that the major problem of the multimodal transport was the monopolistic operation of the system by the government, lack of infrastructure, daring to engage in operation by ESLSE without proper readiness, lack of experience, insufficient freight vehicles, and procedures at custom terminals were among the problems raised in the luncheon. From the chamber report, businessperson also forwarded their recommendation for the ESLSE authorities who attended the luncheon. Opening the system to private sector/ liberalization, inviting foreign actors, solving infrastructure problems are among the solutions forwarded.

On the other hand, it seems the government of Ethiopia also aware of the problem of implementing the multimodal transport system by ESLSE. The government has accepted technical proposals from six international consultants to improve the regulation of multimodal system in Ethiopia (Fortune, 2012).

Since the start of the service ESLSE has made consistent progress in increasing the volume of cargo handled with the multimodal transport system and is able to raise the coverage over 60% of its container lifting. The port dwell time has been improved significantly from above 30 days at the time of start of the service to 7 days recently. With the improvement of quality and reliability of the services it has also succeeded in redressing customer dissatisfaction and wins their confidence. The Company is making continuous improvements to strengthen and further expand the coverage of multimodal transport system (EMAA, 2014).

#### **2.1.8.1 Infrastructure Development in Ethiopia**

Brooks (2008) stated that, transportation infrastructures such as highways and railways can reduce distribution margins of the transportation cost in narrowing the gap between prices faced by producers and consumers, thereby facilitating better improvements for both; in general efficient transportation infrastructures lower transaction costs, raise value added, and increase potential profitability.

According to Tadesse Kenea (2014), the country's capacity to provide multimodal transport service that is reliable and cost effective is depend on many factors among which are the use of

advanced technology and infrastructure. In this regard Ethiopia is not exceptionally free from the challenges rather it may be severe.

In the 2012/13 World Economic Forum (WEF) World Competitiveness Report, Ethiopia's infrastructure development is ranked 119 out of 144, far behind Vietnam and China (95 and 48, respectively), but relatively better than Tanzania and Uganda (132 and 133, respectively) (World Bank Report, 2013).

### 2.1.8.2 Dry Ports in Ethiopia

Dry Port Services Enterprise was established by the Council of Ministry Regulation No. 139/2007 with the objective of facilitate the country import/export and minimize the congestion at the port of Djibouti. A Dry Port (sometimes inland port) is an inland intermodal terminal directly connected by road or rail to seaport and operating as a center for the transshipment of sea cargo to inland destinations. In addition to their role in cargo transshipment, dry ports may also include facilities for storage and consolidation of goods, maintenance for road or rail cargo carriers and custom clearance services. (ESLSE Statistical Bulletin, EFY 2000-2007). Nowadays, there are seven dry ports in Ethiopia; these are Modjo, Kality, Gelan, Semera, Dire Dawa, Kombolcha and Mekelle.

**Table 2.2: Dry Port and Terminal area and carrying capacity**

Dry Port	Area in Hectare	Terminal Capacity in TEU
Modjo	23.67	12675
Kality	3.20	1260
Gelan	4.00	2352
Kombolcah	8.00	3776
Mekelle	3.05	1439
Dire Dawa	0.80	288
Semera	2.50	980

**Source: ESLSE Statistical Bulletin (EFY 2000-2007)**

The Dry Ports are equipped with port machinery: 18 reach stackers, 47 forklifts, 1 crane, 3 empty container handler, 11 terminal truckers and 18 terminal chassis.

The average dwell time of cargoes at dry port reached 50 days, which is the challenge for the productivity of the dry ports (ESLSE unpublished report).

## **2.2 The Empirical Literature Review**

Due to the newness of the research topic in Ethiopian perspective there is no research work made prior to this study which the researcher could easily find and use as an empirical evidence for this research. In spite of this fact, the researcher has been forced to focus on the research made on multimodal transport in general.

Accordingly, Saldanha and Gray (2002) studied the potential of British coastal shipping to be integrated in a multimodal door-to-door supply chain. Hayuth (1987) discussed the concept and practices of the multimodal transport system in general. Martin (1996) explored the growth of multimodal transport services in the context of developed countries. Konings (1996) investigated the developmental aspects of the 'integrated centres' to make the multimodal transport system time-, cost- and quality- effective with a particular emphasis on Rotterdam, The Netherlands. ECMT (1998) assessed the state of multimodal transport in Europe. Stank and Roath (1998) performed a study on the North American shippers' desire for development of multimodal transport and logistics and their anticipated use of the system.

Muller, (1999) discusses the multimodal transport system in a detailed textbook. Faber *et al.*, (1997) worked on the legal context of multimodal transport. Ashar (1999) discusses briefly the revolutionary aspects of multimodal transport systems.

Banomyong, (2000) studied multimodal transport corridors in South East Asia with particular focus on the needs and issues of a land-locked country (Lao FDR). Subramanian and Arnold (2001) studied the sub-regional links in transport and logistics in South Asia and identified some critical impediments for alternative supply chain corridors. This study, as in Bangomyong, (2000) also focused on the issues and perspectives of land-locked countries or regions.

Ockwell(2001) performed a study to develop a benchmarking methodology capable of examining the relationship between the efficiency of the ports and terminals and the efficiency of its intermodal linkages of road, rail and sea.

An OECD (2001) project explored the institutional aspects with the aim of comparing and assessing the impact of different organizational structures on transport planning and multimodal policy development.

Relevant equivalent research specific to Ethiopia is practically non-existent. Fekadu (2013) explored Logistics Practice in Ethiopia and suggested that Ethiopian government, as the infrastructure provider, better invest the limited resources prudently on road, railway, dry ports and terminal infrastructures in line with intermodal transport requirements.

### **2.3 Gap Analysis**

A review of available resources suggests that little research has been conducted on the multimodal transport system in the context of Ethiopia. In particular, none of the above research works focused on identifying the performance dimensions of Multimodal Transport system. Therefore, this study is expected to fill the gap mentioned.

### **2.4 Conceptual Framework from Different Literature**

Today, transport and multimodal transport in particular, is acknowledged as a sub-function of logistics, which itself is part of supply chain management. Multimodal transport decisions have an impact on the feasibility and reliability of supply chains. Shippers and consignees are more interested in supply chain performance than on the actual multimodal transport operations. They require efficient and reliable door-to-door service offered by transport/logistics service providers, who may be multimodal transport operators (Ruth Banomyong, 2000).

Accordingly, the World Bank (2013) has developed six dimensions of Logistics Performance Index:

**1. Customs; efficiency of the customs clearance process in terms of speed, simplicity and predictability**

According to Lane (1999), the mission of Customs is as follows:

- To ensure all goods entering and exiting the country do so in compliance with all laws including revenue.
- To facilitate the entry of all legitimate merchandise into the country.

According to Ruth Banomyong (2000), to implement multimodal transport, Customs are required to facilitate the container flows, through minimization of import/export documents and to permit the movement of cargo to and from ports under bond or in a sealed container.

According to Temple (2001), the international supply chain generally faces at least two sets of customs procedures. So, a simplified and effective procedure is essential for smooth flow of trade cargo and for investment. If customs procedures do not allow deeper penetration of containers the flow is hampered and the Inland Container Depot (ICD) will be less effective. It will result in more transit time, transport cost and uncertain schedule reliability due to multiple handling of cargo.

**2. Infrastructure; Ports, Roads, Railways, Warehouses, Fleet vehicles, Information Technology**

As per Ruth Banomyong, (2000), where transport infrastructure is poor, the development of multimodal transport may not be easy. In order to be able to gain maximum benefit from multimodal transport, infrastructure that is capable of handling containers must be in place. To remain competitive, exporters and/or importers must be able to reduce transportation costs that are included in the goods' delivered price. In order to improve or eliminate such hidden costs, it is essential to improve the quality of a region's or a country's international transport and logistics capabilities. The adaptation of commercial practices to international standards is a prerequisite as well as removing any unnecessary trade barriers.

A superior transport infrastructure supports intermodal transport systems, including access roads to terminals and seaport channels (World Bank, 2015).

**Table2.3: Infrastructure to handle container**

Port	<ul style="list-style-type: none"> <li>• Cranes-Ship to Shore</li> <li>• Stacking Areas-Container Yards</li> <li>• Container Handling Equipment</li> <li>• Communications Systems</li> </ul>
INLAND TRANSPORT	
Roads  Rail  Inland waterways	<ul style="list-style-type: none"> <li>• Axle Loading</li> <li>• Bridges &amp; Tunnels</li> <li>• Rolling Stock</li> <li>• Motive Power</li> <li>• Bridges &amp; Tunnels</li> <li>• Cranes &amp; Stacking Areas</li> <li>• Lake/River craft (barges, etc.)</li> </ul>
Inland Destination	
Inland Clearance Depot (ICD)	<ul style="list-style-type: none"> <li>• Container Handling Equipment</li> <li>• Stacking Areas</li> <li>• Road, Rail &amp; Inland Waterway access</li> </ul>

Source: UNCTAD (1990)

If the transport infrastructure is weak and ports and terminals lack multimodal access and other facilities then the goods movement and modal transfer will result in higher transit time, transport cost, loss or damage and higher uncertainty and unreliability (Islam, 2005).

**3. Competence: skill and expertise to provide quality logistic services**

According to Fekadu (2013), availability of skilled manpower, conducive labour regulations and business environment promotes economic activities. On the most of these criteria, Ethiopian logistics system is found to be poor. The main freight transport companies lack capacity in terms of skilled human resources, management skills and number of fleets of vehicles. They are fragmented. The main companies are government owned, this will result in inefficiency.

#### **4. Timeliness; frequency with which shipments reach the consignee within the scheduled or expected time**

Timeliness of shipments in reaching destination measures how reliably shipments meet the promised delivery times. More reliable delivery will lower transit time of transport from origin to destination and will enable a greater control of costs, schedules and cargo safety (World Bank, 2015).

According to Henstra & Woxenius (1999), transport related decisions are dependent upon a set of transport service requirements, such as lead time, reliability, etc. This means that the shippers generally do not specifically demand a special transportation mode, but rather a transport performance. Shippers expect to receive a reliable door-to-door service from transport/logistics service providers.

#### **5. Competition; ease of arranging competitively priced shipments**

According to Ruth Banomyoung (2000), the MTO's competitiveness in offering his services will depend on how he can take advantage of all possible management techniques available to make better use of the existing capacity and operating conditions of each specific link of the transport chain. The MTO is thus providing logistical services. The exporter will benefit by being more competitive in reaching the foreign buyer at minimum costs, minimum time with goods delivered in good conditions. The importer will also benefit from multimodal transport, as goods he has ordered, will be delivered to his premises at minimum cost and in good conditions.

If a mechanism of effective competition in multimodal markets could be established, the quality of MT services will certainly be improved to a great extent (GuibinXu, 1999).

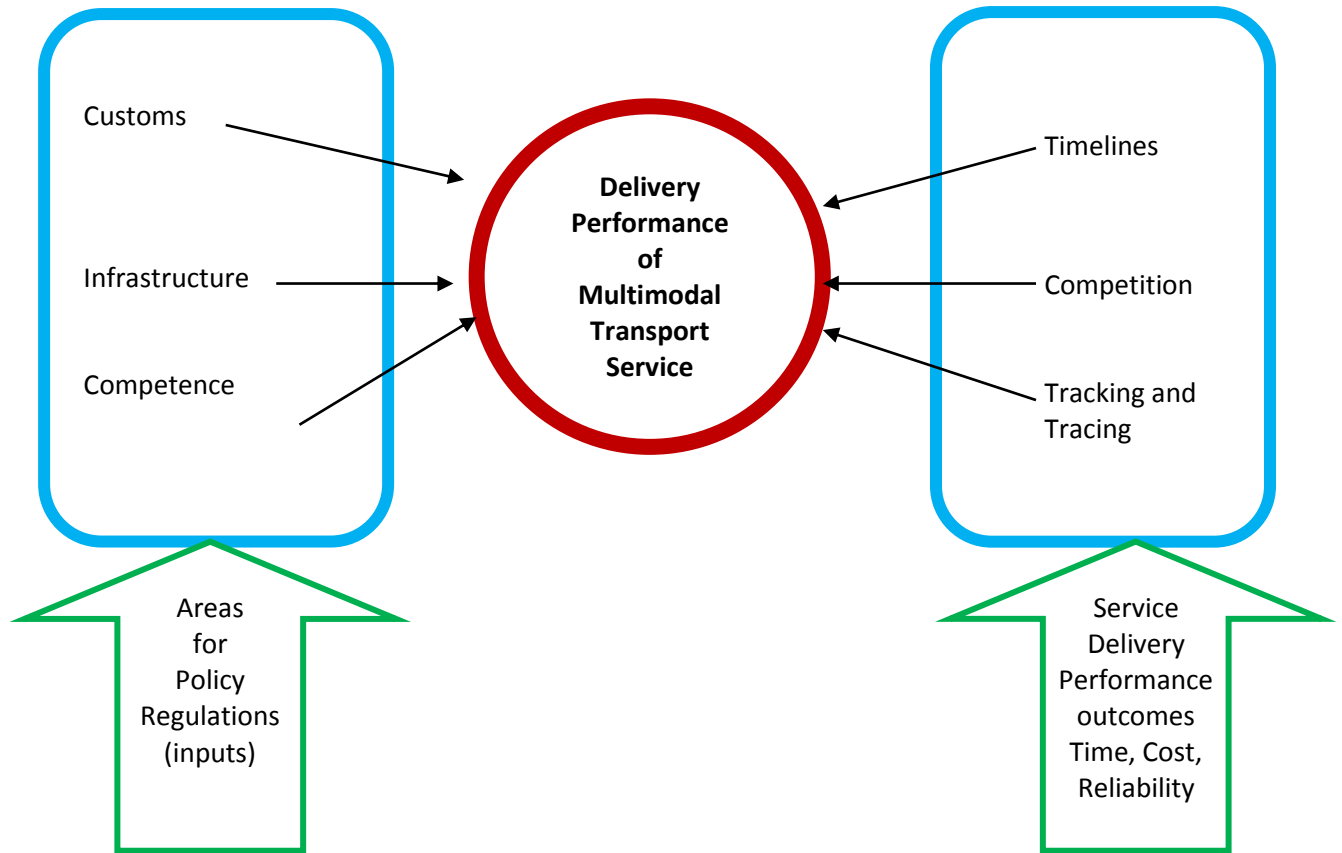
According to Islam (2005), if there is not port and terminal competition, the quality of services is restricted and transit time and transport costs increased. On the other hand, the inland transport market is virtually enjoying an effective competitive regime, which is free from government restrictive regulation.

## **6. Tracking and Tracing; ability to track and trace consignments**

According to (GuibinXu, 1999), container tracking and tracing system is enabling transport operators and trading partners to track containers from their origin to destination and to predict the estimated time of arrival of inbound loads. This technology would play a very important role in promoting multimodal transport.

The importance of tracking and tracing of shipments is considered to be quite high in terms of customer service and essential for managing logistics networks efficiently. Global industries are facing problems both from tracking and tracing in their logistics supply networks, that creates huge coordination problems in the overall product development sites. This problem loses the track among production, delivery and distribution in the complete logistics chain from source to destination, which is responsible for opportunity cost through customers' dissatisfaction. Tracking system helps to identify the position of the shipment and informed the customer in well advance. Without tracking system it is almost impossible to find out delivered items and often considered as lost or stolen item that causes business loss (AHM and Helo, 2011)

Accordingly, the following modified model is developed.



**Figure- 2.1: Conceptual Frame work adopted and modified from World Bank Logistic Performance Index (2015)**

## **CHAPTER THREE**

### **REASERCH DESIGN AND METHODLOGY**

This part of the research explains the research design and methodology deployed in order to undertake this specific research work. It has included some very important sub topics in it.

#### **3.1 Description of the Study Area**

The methodology applied by the study has been chosen in order to acquire information and deduce conclusions about the performance of multimodal transport service in Ethiopian Shipping and Logistics Enterprises Enterprise.

#### **3.2 Research Approach**

Basically the research used a mixed research involving both qualitative and quantitative approaches. As proposed by Bhattacharjee (2012), mixed research approach in any research used for a better understanding of the research problem than either of each alone and provides a ground for the use of several means (methods, data sources and analysis) to examine the same subject matter under the study.

Quantitative research approach is used to quantify the respondents' evaluation of the performance of Multimodal Transport service in Ethiopia by generating numerical data or data that can be transformed into useable statistics.

Qualitative research is used to gain an understanding of customer and management experience, opinions, and perceptions with respect to Multimodal Transport System the enterprise performing, by use of questionnaires and interview. The integration of both qualitative and quantitative researches provided a more complete and comprehensive understanding of the performance of multimodal transport system.

#### **3.3 Research Design**

Depending on the objectives of the study descriptive research design was chosen and used. According to Kothari (2004) descriptive research studies are those studies which are concerned

with describing the characteristics of a particular individual, or of a group, whereas diagnostic research studies determine the frequency with which something occurs or its association with something else. Selecting of the descriptive research method helped to describe the research findings using major statistical measures such as mean and standard deviation.

### **3.4 Population and Sampling Technique**

#### **3.4.1 Population**

The total population of the study comprises the entire number of multimodal transport customers of ESLSE. According to unpublished data of the enterprise, in year 2016 the enterprise has more than 3000 multimodal transport customers. Therefore, all the customers of multimodal transport system were the total population of the study and they have been represented by the sample group.

#### **3.4.2 Sampling Technique**

Collecting and analyzing of data from the entire population found to be costly to the researcher in terms of money, time and energy demand. Due to this fact, the researcher determined the sample group who represent the total population. For ease of sampling, the sampling frame have been determined first. The sampling frame is the list of all customers of multimodal transport from which the sample group was taken. From probability sampling technique, simple random sampling method was used to determine the actual sample group who filled out the questionnaire. This is due to the fact that, this method was found giving equal chance of being selected into the sample group for every member of a population.

Only two managements from ESLSE were given a chance for interview representing the Enterprise based on their involvement in multimodal transport service. Unlike the sampling method used for customers, purposive judgmental sampling method from non-random sampling technique was used to identify the right interview members.

#### **3.4.3 Sample Size**

According to Cooper and Schindler (2003), in different circumstances researchers question how large a sample size they should use to make the sample representative of the population. In

reality, how large a sample should be is a function of the variation in the population parameters under study and the estimating precision needed by the researcher.

According to University of Florida (2014), in addition to the purpose of the study and population size, there are three criteria required to be fulfilled to determine the appropriate sample size. These are:

1. *The level of precision* sometimes called *sampling error*, which is the range in which the true value of the population is estimated to be. The range is often expressed in percentage points (e.g.,  $\pm 1$  percent).
2. *The level of confidence or risk level* is based on ideas encompassed under the Central Limit Theorem. The key idea encompassed in the Central Limit Theorem is that when a population is repeatedly sampled, the average value of the attribute obtained by those samples is equal to the true population value.

Furthermore, the values obtained by these samples are distributed normally about the true population value. In a normal distribution, approximately 95% of the sample values are within two standard deviations of the true population value (e.g., mean). In other words, this means that if a 95% confidence level is selected, 95 out of 100 samples will have the true population value within the range of precision specified. There is always a chance that the sample you obtain does not represent the true population value. This risk is reduced for 99% confidence levels and increased for 90% (or lower) confidence levels.

3. *The degree of variability* in the attributes being measured refers to the distribution of attributes in the population. The more heterogeneous a population, the larger the sample size required to obtain a given level of precision. The less variable (more homogeneous) a population, the smaller the sample size required.

Considering the homogeneity nature of the population under study, the researcher determined the sample size using the following sample size determination formula. Given the homogeneity nature of the population, the researcher believes that the output obtained with this sample size properly represents the total population. It is because if the items of the universe are

homogeneous, a small sample can serve the purpose. But if items are heterogeneous, a large sample would be required (Kothari,2004).

Using Census for small population, sample size imitation from similar studies, using published tables, and applying formulas are the four methods described to determine a sample size (University of Florida, 2014). For this specific research, the researcher will use formula method using the sample size determination formula provided by the website of the university and calculated the sample size as below. Since the formula is the right method of sample size determination in case of infinite or large population size. As it is discussed earlier the population of the study is large and that witnesses the appropriateness of the formula method.

$$n = \frac{Z^2 pq}{e^2}$$

Where:-

n = denotes sample size,

$Z^2$  = represents the abscissa of the normal curve that cuts off an area  $\alpha$  at the tails ( $1 - \alpha$  equals the desired confidence level, that is 95%). The value of Z is found in statistical tables which contain the area under the normal curve.

e = is the desired level of precision,

p = 0.1, the researcher estimated the proportion of an attribute that is present in the population since the population is attributed by homogeneous character. It means that there is very less variability in the population.

q = is 1-p.

$$n = \frac{(1.96)^2(0.1)(0.9)}{(0.05)^2} = \frac{(3.842)(0.09)}{0.0025} = 138$$

As it is indicated the sample size determined using the formula method is 138. The research used this sample size to define the sample groups who have been participated in supplying primary data through questionnaire.

## **3.5 Data Sources and Tools**

### **3.5.1 Data Sources**

The study used both primary and secondary data sources. The primary data were collected from the Enterprise's customers using questionnaire and from managements using unstructured interview. Both tools were used to collect raw data regarding respondents' evaluation of the multimodal transport service.

Secondary data, collected internally from the Enterprise's reports and EMAA manuals, brochure and journals. These were interpreted and analyzed to assess the performance of multimodal transport service.

### **3.5.2 Data collection Tools**

Mainly the data collection tool the study used is questionnaire. Questionnaire was selected because, firstly, it is economical in terms of researcher time, effort and cost than most other methods. Secondly, it is more appropriate and found easy for respondents to fill and forward their feelings and responses for questions. It kept away from researcher bias, guiding and cues that can impact the legitimacy and reliability of the data collection. Thirdly, it is through questionnaires that standardized responses gathered Bhattacharjee (2012).

To supplement the survey, un-structured interview was conducted with two management of the enterprise. The major purpose of the interview was to substantiate certain facts that the researcher already thought. Therefore, the un-structured interviews were conducted to enhance and supplement the results of the study.

The questionnaire contained three parts. The first part is designed to collect respondents' background information and second part is the structured to collect respondents' general information. The third part is structured questions designed to measure each dimension and with the five-point Likert scale (1 = strongly disagree to 5 = strongly agree). This helped to make questions interesting to respondents and, thereby, enhance their cooperation, ultimately to ensure maximum response rate.

### **3.6 Data Collection Procedures**

First, structured questionnaire was developed and distributed to the target population 138 respondents. All of the respondents were filled and returned.

Interview was conducted with two managements (directors) to supplement the questionnaire in the performance of multimodal transport service.

### **3.7 Method of Data Analysis**

In this section, data preparation and description of the data are done respectively. The data preparation involves editing, coding and enter the data in computer and the data analysis has been done by using both qualitative and quantitative analysis. Descriptive statistics was used to analyze the basic features of the data in the study for the quantitative analysis. In this study, SPSS software was applied to analyze and interpret the data. The data are tabulated and summarized using percentages and frequency distribution tables, mean and standard deviation were used for presentation of findings.

### **3.8 Ethical Consideration**

Research involving people must be developed ethically; particularly this includes the responsibility of the researcher to protect the privacy of the individuals that participate in the study. This privacy protection must extend to all people's, regardless of age, religion and race.

## CHAPTER FOUR

### FINDINGS, DISCUSSIONS AND INTERPRETATION

This part of the paper presents the data analysis section of the paper. Questionnaire was the main data collection tool used supported by interview. The data collected via questionnaire were summarized, organized and analyzed using statistical software called Statistical Package for Social Science (SPSS). Descriptive statistics method was mainly used to analyze the data and the findings are presented in percentages and frequency distribution, mean and standard deviations.

#### 4.1 General Overview of the Data

The survey was undertaken to assess the performance of multimodal transport service in Ethiopian Shipping and Logistics Services Enterprise. For that purpose questionnaire was developed and distributed to the multimodal customers (total of 138) of Ethiopian Shipping and Logistics Service. From the distributed 138 questionnaire all 138 were responded. This makes the response rate 100%. At the time of data screening for accuracy and completeness no questionnaire was found to be unusable.

**Table 4.1: Number of questionnaire distributed and collected**

Questionnaire	Respondents	
	Number	Percentage
Released questionnaires	138	100
Not Returned	0	0
Returned	138	100
Returned but disregarded	0	0
Total sample size	138	138

## 4.2 Measurement of Reliability and Validity

Reliability refers to the quality of a measurement procedure to provide repeatability and accuracy. A construct is said to be reliable or consistent if it brings same result when we use it multiple times Bhattacharjee (2012). Since we used multiple-item construct measure to the respondents, the extent to which respondents rate those items in a similar manner or in short the ‘internal consistency’ was estimated after conducting pilot survey by including all the items. The internal consistency of the scale items was computed using the commonly applicable method called Cronbach alpha. Thus, the overall reliability of the scale was found to be 0.972 which indicates the acceptability of the items.

**Table 4.2 Cronbach’s Alpha Reliability Statistics**

Variable	Cronbach’s Alpha	N of Items
Custom	0.838	8
Infrastructure	0.921	9
Competence	0.909	2
Timeliness	0.876	7
Competition	0.854	2
Trucking and Tracing	0.850	7
Overall	0.972	35

**Source: Survey Questionnaire, 2017**

To assure the construct validity, that is whether our measure adequately represents the underlying supposed to measure, theoretical assessment of validity was undertaken. Accordingly, the items were partially adopted from previous studies and partially based on the definitions given by different researchers listed above. Besides, appropriate research procedures were applied to find the answers to the basic question. With this the construct validity is also assured.

### 4.3 The Demographic Characteristics of Respondent's

The variables used for our sample's demographic information are sex, age, educational status, work experience, sector of respondents, present status, job position and foreign trade partner origin.

#### 4.3.1 Sex of Respondents

**Table 4.3: Summary of Sex of Respondents**

		Frequency	Percent
Valid	Male	88	63.8
	Female	50	36.2
	Total	138	100.0

**Source: Survey questionnaire, 2017**

As it is clearly seen on Table No. 4.3, the respondents were composed of relatively more male customers (63.8%) and lesser female customers (36.2%). This was because during data collection the researcher met more male customers than female by chance or may be the company has lesser female customers than male customers for multimodal transport.

#### 4.3.2 Age of Respondents

**Table 4.4 Summary of Age of Respondents**

		Frequency	Percent
Valid	1. Below 25 years	11	8.0
	2. 25-35 years	55	39.9
	3. 36-45 years	45	32.6
	4. 46-45 years	14	10.1
	5. Over 55 years	11	8.0
	Total	136	98.6
Missing	System	2	1.4
Total		138	100.0

**Source: Survey questionnaire, 2017**

As clearly seen on the table 4.4, the majority of the respondents (39.9%) were between the age of 25-35, 32.6% of the respondent were the age between 36-45, 10.1% of the respondent were the age between 46-45 and 8.0% of the respondent were the age below 25 years and the remaining 8% of the respondent were the over 55 years old. This shows that the majority of the respondents were on working age.

### 4.3.3 Educational Background of Respondents

**Table 4.5 Summary of Respondents' Educational Background**

		Frequency	Percent
Valid	12 <sup>th</sup> Grade Completed	20	14.5
	Diploma	29	21.0
	1 <sup>st</sup> Degree	74	53.6
	Above 1 <sup>st</sup> Degree	11	8.0
	Total	134	97.1
Missing	System	4	2.9
Total		138	100.0

**Source: Survey questionnaire, 2017**

As per Table No.4.5 out of 138 respondent 4 were not disclosed their educational level. According to the table above, the educational background of the customer respondents were mainly graduates at 1<sup>st</sup> degree level (53.6 %), followed by diploma graduate (21.0 %) and 14.5% of the respondents were 12 grade completed. Finally the remaining 8.0% of the respondents were above 1<sup>st</sup> degree.

### 4.3.4 Work Experiences of Respondents

**Table 4.6 Summary of Respondents' Work Experience**

		Frequency	Percent
Valid	Below 5 years	21	15.2
	5-10 years	50	36.2
	11-15 years	28	20.3
	Above 15 Years	33	23.9
	Total	132	95.7
Missing	System	6	4.3
Total		138	100.0

**Source: Survey questionnaire, 2017**

According to Table No 4.6 out of the total respondents 6 (4.3%) respondents were not disclosed their work experience. Accordingly 36.2% of the respondents served between 5-10 years, 23.9% of the respondents served above 15 years, 20.3% of the respondents served between 11-15 years and the remaining 15.2% of the respondents have below 5 years of work experience. This implies that the majority of the respondents have work experience more than five years.

### 4.3.5 Import Export and ESLSE Experience of the Respondents

**Table 4.7: Summary of Respondents' Import Export and ESLSE Experience**

		How long you have been engaged in import and export trade?		For how many years have you been the customer of ESLSE?	
Valid	Years	Frequency	Percent	Frequency	Percent
	Less than 1 year	4	2.9	6	4.3
	1-4 years	37	26.8	35	25.4
	5-10 years	58	42.0	59	42.8
	Over 10 years	39	28.3	38	27.5
	Total	138	100.0	138	100.0

**Source: Survey questionnaire, 2017**

The above table shows that 42% of the respondents have 5-10 years of experience in import export trade and 42.8% of the respondent were customer of ESLSE between 5-10 years, 28.3% of the respondent have more than 10 years of experience in import export trade and 27.5% of the respondent were customer of ESLSE for more than 10 years, 26.8% of the respondent have between 1-4 years of experience in import export trade and 25.4 of the respondent were customer of ESLSE between 1-4 years. The remaining 2.9% of the respondents have less than 1 year experience in import export trade and 4.3% of the respondent was customer of ESLSE for less than 1 years. It assumes that the customers know well about the organization.

### 4.3.6 Sector of the Respondents

**Table 4.8: Summary of sector of respondents**

		Frequency	Percent
Valid	Manufacturing	43	31.2
	Trade	50	36.2
	Investment	4	2.9
	Other	41	29.7
	Total	138	100

**Source: Survey questionnaire, 2017**

As per the above table, 36.2% of the respondents are engaged in trade sector and followed by 31.2% of the respondents are manufacture sector. These address that the majority of Multimodal transport customers are not one time clients rather they have continuous business relations with ESLSE.

#### 4.3.7 Present status of the enterprise of respondents

**Table 4.9: Summary of respondents' present status of the Enterprise**

		Frequency	Percent
Valid	Governmental Public Enterprise	36	26.1
	Government Budgetary	11	8.0
	Private company	84	60.9
	Non-Governmental Organization	6	4.3
	International Organization	1	7
<b>Total</b>		<b>138</b>	<b>100.0</b>

**Source: Survey questionnaire, 2017**

The above table shows that the majority of the respondents (60.9%) were private company, whereas international organization has the lowest respondents (7%). Therefore the researcher has expected to gain unbiased opinion from its participant.

#### 4.3.8 Job Position of Respondents

**Table 4.10: Summary of Respondents' Job Position**

		Frequency	Percent
Valid	Company owner/Company Manager	5	3.6
	Procurement/Logistic Manager	39	28.3
	Procurement/Logistic Officer	56	40.6
	Custom Forwarding/Transitor	38	27.5
	<b>Total</b>	<b>138</b>	<b>100.0</b>

**Source: Survey questionnaire, 2017**

Considering the position of the respondents, 40.6% of the respondents were Procurement/Logistic officer, 28.3% were Procurement/Logistic Manager, 27.5% were Custom Forwarding/Transitor and the rest 3.6% were Company Owner/Company Manager. As far as the respondents' job position is concerned, all of them have shown their job position. Those respondents who have shown their job position as Customs forwarder or transitor might be either working as a transitor in their import or export company or representing customs forwarding/clearing company.

#### 4.3.9 Foreign Trade Partners Origin of the Respondents

**Table No. 4.11 Summary of Respondents' Foreign Trade Partners**

		Frequency	Percent
Valid	1. China and Far East	62	44.9
	2. Europe and America	35	25.4
	3. Gulf and Middle East	20	14.5
	4. Africa	2	1.4
	5. More than one	19	13.8
<b>Total</b>		<b>138</b>	<b>100.0</b>

Source: Survey Questionnaire, 2017

As per the above table 44.9%, 25.4%, 14.5% and 13.8% have trade partners originating from China and Far East, Europe and America, Gulf and Middle East and more than one choice respectively. The trade partners originating from Africa represented only 1.4%.

#### 4.3.10 Respondents' understanding and exposure to implementation of MTS in Ethiopia

**Table 4.12: Summary of Respondents' general understand and exposure to implementation of Multimodal Transport System in Ethiopia**

		Frequency	Percent
Valid	Excellent	13	9.4
	Very Good	109	79.0
	Good	12	8.7
	Satisfactory	2	1.4
	Below Satisfactory	2	1.4
	<b>Total</b>	<b>138</b>	<b>100.0</b>

Source: Survey Questionnaire, 2017

As per the above table 79% of the respondents have a very good understanding and exposure to implementation of multimodal transport system in Ethiopia. The remaining 9.4%, 8.7%, 1.4%, 1.4% respectively have excellent, good, satisfactory, and below satisfactory understanding and exposure to multimodal transport system in Ethiopia. This represents the majority of the respondent have a very good understanding and exposure to implementation of the multimodal transport system in Ethiopia.

#### 4.3.11 Respondents' evaluation of major change in MTS during last five years

**Table 4.13: Summary of respondents' evaluation of major change occurred in the last five years in the multimodal transport service**

	Frequency	Percent
Valid Yes	130	94.2
No	8	5.8
Total	138	100.0

Source: Survey Questionnaire, 2017

As per the above table 94.2% of the respondents were agreed regarding the major change occurred in the last five years in multimodal transport service. The remaining 5.8% of the respondent were not agreed with the major change in the multimodal transport service. This implies that there is a gradual improvement in multimodal transport service within the last five years.

#### 4.4 Analysis and discussion on the performance of multimodal transport Service

In this part of the study's report, analysis conducted on data gathered from 138 customers to assess the performance of multimodal transport service based on the six performance dimensions (custom, infrastructure, competence, timeliness, competition and trucking and tracing) was presented. Descriptive statistics (Mean and standard deviation) was used to analyze the data in this study. It is taken in to account that numbers 1, 2, 3, 4 and 5 represent strongly disagree, disagree, neutral, agree and strongly agree, respectively. A standard deviation of  $>0.9$  implies a significant difference on the impact of the variable among respondents.

##### 4.4.1 Custom Performance

Ruth Banomyong (2000), a literature review depicts that to implement multimodal transport, customs are required to facilitate the container flows, through minimization of import/export documents and to permit the movement of cargo to and from ports under bond or in a sealed container. According to the information obtained from the interview, multimodal transport service cannot work independently without the influence of custom office. Since the customs office comes at the forefront in the multimodal transport services operation due to the reason that no shipment can be delivered to customers without fulfilling customs formalities, as a result the transit time and the

delivery performance of multimodal transport service become dependent on the services of customs office.

**Table 4.14: Descriptive Statistics Value of Custom Performance**

Var. No.	Variables	N		Mean	Std. Deviation
		Valid	Missing		
1	Customs have developed a system or procedure for multimodal transportation of container.	138	0	3.30	0.876
2	The custom clearance process for multimodal shipments of container is efficient	138	0	2.36	0.723
3	All multimodal shipments of container are cleared and delivered as scheduled	138	0	2.31	0.648
4	The customs clearance procedure for multimodal shipments is transparent.	137	1	2.54	0.728
5	The customer receive adequate and timely information when regulations of custom change.	138	0	2.28	0.613
6	Since the past five years the customs clearance procedures for multimodal transport service is improved	136	2	3.86	0.722
7	The existing coordination level between customs offices and ESLSE is strong	138	2	2.77	0.517
8	The overall performance level of custom offices in relation to multimodal operation is satisfactory	138	2	2.22	0.527
<b>Average Score</b>				<b>2.71</b>	<b>0.669</b>

**Source: Survey Questionnaire, 2017**

Table 4.12 shows that the descriptive statistics of custom dimension in evaluating the performance of multimodal transport service based on arithmetic mean and standard deviation. It is based on the responses of 138 sample respondents on the eight described items on the table.

It is clear from table that customs have developed a system or procedure for multimodal transportation of container and since the past five years the customs clearance procedures for multimodal transport service is improved have scored the highest mean value of 3.30 and 3.86 respectively, stating that

most of the respondents scored agree on these two regards and scored standard deviation value of 0.876 and 0.722 respectively indicating that the respondents were agreeing to the same idea.

On the remaining six variables the majority of the respondents negatively evaluated the custom performance a mean value ranging from 2.22 to 2.77 and a standard deviation value of ranging from 0.517 to 0.728, which indicates that the majority of respondents were disagreed and have closed response to the same idea. Thus as agreed by the respondents, the custom developed a system or procedure for clearing multimodal transport cargos but when come to the efficiency of the custom clearance process, the customers are dissatisfied and disagreed.

In summary the average mean and standard deviation value of 2.71 (disagree) and 0.699 was obtained in relation to custom performance and this shows that the custom clearance process is not suitable to deliver efficient multimodal transport service.. Thus the prevailing challenges are the inefficient custom clearance process, all multimodal shipments of container are not cleared and delivered as scheduled, lack of transparency in clearing multimodal cargo, the customers are not receive adequate and timely information when regulation change are the majority of the problems as evaluated by the customers. And according to the information obtained from the interview customs offices is not supporting the operation of multimodal transport service as to the required level. And the customs operational procedures and document requirement are not facilitating the operations of multimodal transport as it is supposed to be and characterized by manual inspections, paper review and repetitive checking.

According to Temple (2001), a literature review depicts that the international supply chain generally faces at least two sets of customs procedures. So, a simplified and effective procedure is essential for smooth flow of trade cargo and for investment. If customs procedures do not allow deeper penetration of containers the flow is hampered and the Inland Container Depot (ICD) will be less effective. It will result in more transit time, transport cost and uncertain schedule reliability due to multiple handling of cargo.

#### 4.4.2 Infrastructure Performance

Brooks (2008), a literature review shows that, transportation infrastructures such as highways and railways can reduce distribution margins of the transportation cost in narrowing the gap between prices faced by producers and consumers, thereby facilitating better improvements for both; in general efficient transportation infrastructures lower transaction costs, raise value added, and increase potential profitability.

Ruth Banomyong, (2000), in order to benefit fully from multimodal transport service the minimum level of transport related infrastructure must be in place. Thus, the importer will benefit from multimodal transport service, as goods he has ordered, will be delivered to his premises at minimum cost and in good conditions.

**Table 4.15: Descriptive Statistics Value of Infrastructure Performance**

Var. No.	Variables	N		Mean	Std. Deviation
		Valid	Missing		
1	The inland transport infrastructure is suitable for origin-to destination containerized cargo movement.	138	0	1.71	0.675
2	Road transport is adequate to meet the need of inland-containerized cargo movement.	138	0	1.78	0.752
3	Railway is capable to meet the need of inland-containerized cargo movement.	136	2	3.30	0.461
4	ESLSE have enough number of trucks with significant capacity to render effective and efficient multimodal transportation service.	138	0	1.79	0.719
5	The dry ports, terminals and warehouses are adequate for handling multimodal cargo	138	0	1.85	0.627
6	The dry ports, terminals and warehouses are well equipped with the necessary equipment and facilities.	136	2	1.76	0.669
7	The dry ports and terminals do have enough space and capacity to accommodate all incoming and outgoing cargos even in peak periods.	138	0	1.86	0.686
8	Since the past five years the transport related infrastructure for multimodal transport service is improved	138	0	3.78	0.705
9	The overall performance of transport related infrastructure in relation to multimodal transport service is satisfactory	136	2	1.82	0.719
<b>Average Score</b>				<b>2.18</b>	<b>0.688</b>

Source: Survey Questionnaire, 2017

As indicated in the table 4.15 nine variables have been provided to evaluate the infrastructure dimension in providing efficient multimodal transport service. Out of the nine variables stated above, only two variable, the improvement of transport related infrastructure during the past five years and railway is capable to meet the need of inland-containerized cargo movement have score a mean value of 3.78 and 3.30 and standard deviation value of 0.705 and 0.461 (agreeing the same idea) respectively. This indicates that the majority of the respondents were agreed on these two variables. Regarding railway, the majority of the respondent agreed may be because of the fact that the railway is planned by the government and expected to start moving of containerized cargo from Djibouti to dry ports in the near future and will contribute to the improvement of freight transport in Ethiopia. And according to the information obtained from media and ESLSE notice board, 10 containers transported from Djibouti to Modjo Dry Port by rail as a first test.

On the remaining seven variables, the mean score of 1.71, 1.76, 1.78, 1.79, 1.81, 1.85 & 1.86 and a standard deviation ranging from 0.669 to 0.752 were obtained for the inland transport infrastructure is suitable for origin-to destination containerized cargo movement, the dry ports, terminals and warehouses are well equipped with the necessary equipment and facilities, road transport is adequate to meet the need of inland-containerized cargo movement, ESLSE have enough number of trucks with significant capacity to render effective and efficient multimodal transportation service, the overall performance of transport related infrastructure in relation to multimodal transport service is satisfactory, the dry ports, terminals and warehouses are adequate for handling multimodal cargo and the dry ports and terminals do have enough space and capacity to accommodate all incoming and outgoing cargos even in peak periods, respectively. This indicates that the majority of the respondents were strongly disagreed on the infrastructure performance.

The majority of the customer evaluated the infrastructure performance as disagree with the average mean value of 2.18 and standard deviation value of 0.668. This implies that the existing infrastructure is no suitable to provide efficient and effective multimodal transport service. According to Tadesse Kenea (2014), a literature review entails that the country's capacity to provide multimodal transport service that is reliable and cost effective is depend on many factor

among which are the use of advanced technology and infrastructure. In this regard Ethiopia is not exceptionally free from the challenges rather it may be severe.

In summary as per the customer evaluation of the infrastructure the following challenges are prevail in the current multimodal transport service as far as infrastructure is concerned, which are inland and the road transport are not suitable and adequate for door to door movement of containerized good, ESLSE have not enough number of trucks for efficient and effective transportation of multimodal goods, the dry ports, terminals and warehouse are not equipped with the necessary equipment and facilities, the dry ports, terminals and warehouse are not enough in number and not have enough space and capacity for handling and accommodating all the incoming and outgoing multimodal goods. And the overall performance of transport related infrastructure in supporting the efficient and effective performance of multimodal transport service is not satisfactory. According to Islam (2005), a literature review depict that if the transport infrastructure are weak and ports and terminals lack multimodal access and other facilities then the goods movement and modal transfer will result in higher transit time, transport cost, loss or damage and higher uncertainty and unreliability.

#### 4.4.3 Competence Performance

**Table 4.16: Descriptive Statistics Value of Competence Performance**

Var. No.	Variables	N	Mean	Std. Deviation
31	There is enough skill and expertise in ESLSE to operate multimodal transport systems as Multimodal transport operator	138	2.53	0.830
32	Logistics knowledge and skill of management and employee in ESLSE improved over the last 5 years.	138	3.08	0.792
<b>Average Score</b>			<b>2.81</b>	<b>0.811</b>

**Source: Survey Questionnaire, 2017**

To evaluate the competence performance of multimodal transport service two questions have been provided to the respondents. Accordingly mean score of 2.53 and a standard deviation of 0.830 was obtained in regards to there is enough skill and expertise in ESLSE to operate multimodal transport systems as Multimodal transport operator. This implies that the majority of the respondents were disagreed and a standard deviation value of 0.830 shows that the respondents have a closed response on the same issue.

Logistics knowledge and skill of management and employee in ESLSE improved over the last 5 years has scored a mean value of 3.08 and standard deviation value of 0.792. This indicates that the majority of respondents were agreed on this issue and the standard deviation result show closed customer response.

In summary the average mean and standard deviation of value of 2.81 (disagree) and 0.811 (close response to the same idea) was found respectively. This indicate that the management and employee in ESLSE have no the competence to provide efficient multimodal transport service. Thus as per the customer evaluation of the competence the prevailing challenge in this regard is lack of skill and expertise manpower in logistic sector as a multimodal transport operator. According to Fekadu (2013), a literature review reveals that availability of skilled manpower, conducive labour and business environment promotes economic activities. On the most of these criteria, Ethiopian logistics system is found to be poor. The main freight transport companies lack capacity in terms of skilled human resources, management skills and number of fleets of vehicles. The main companies are government owned, this will result in inefficiency.

#### 4.4.4 Timeliness Performance

**Table 4.17: Descriptive Statistics Value of Timeliness Performance**

Var. No.	Variables	N		Mean	Std. Deviation
		Valid	Missing		
1	Shipments are coming with minimum process time in Djibouti and reasonable transportation time than ever	136	2	3.08	0.835
2	Shipments reach the designated dry ports within the scheduled or expected delivery time	136	2	2.70	0.846
3	Cargo handling time in dry port is short and provided easily with acceptable waiting time	136	2	2.26	0.611
4	The ESLSE overall performance on time delivery of service is satisfactory	136	2	2.54	0.729
5	The customer received their shipments within the free time from designated dry ports.	136	2	1.94	0.814
6	Since the past five years the multimodal transport service on meeting scheduled or expected delivery time is improved	136	2	3.73	0.626
7	The ESLSE overall performance on meeting scheduled or expected delivery time is satisfactory	136	2	2.44	0.568
<b>Average Score</b>				<b>2.67</b>	<b>0.718</b>

Source: Survey Questionnaire, 2017

Among the description, the customer received their shipments within the free time from designated dry ports as stated in table 4.17 has scored the least mean value of 1.94 and scored a standard deviation value of 0.814. This implies that the majority of the customer is not received their container from the designated dry port within the free time (within 8 days of arrival). As per the information obtained from interview and annual report of ESLSE the average dwelling time at dry port is 50 days. This leads to congestion of the dry ports and which in turn decrease the efficiency of the dry ports by limiting the intake capacity of the incoming containers and which also decrease the efficiency of the custom clearance process.

Cargo handling time in dry port is short and provided easily with acceptable waiting time, the ESLSE overall performance on meeting scheduled or expected delivery time is satisfactory, the ESLSE overall performance on time delivery of service is satisfactory and shipments reach the designated dry ports within the scheduled or expected delivery time have scored the mean value of 2.25, 2.44, 2.54 and 2.70 respectively and the standard deviation value ranging from 0.661 to 8.46. These imply that the majority of the respondent disagreed and dissatisfied with the ESLSE performance on meeting scheduled/expected delivery time. According to the information obtained from interview cargo handling time at dry ports is high due to shortage of cargo handling equipment and poor infrastructure and other facilities at dry port.

On the other hand, shipments are coming with minimum process time in Djibouti and reasonable transportation time than ever and since the past five years the multimodal transport service on meeting scheduled or expected delivery time is improved have scored a mean value of 3.08 and 3.73 and a standard deviation value of 0.835 and 0.626 respectively. These imply that the respondent positively evaluated as agreed on the two items and the standard deviation value determined the customers were agreed on the same issue.

In summary the majority of the respondents evaluated timeliness as disagree with a average mean value of 2.67 and a standard deviation value of 0.718. This implies that the ESLSE performance on meeting scheduled or expected delivery time is poor. Thus as per the customer evaluation of the timeliness the prevailing challenge in this regard is not meeting scheduled or expected delivery time, high cargo handling time at dry port and the high dwelling time at the dry port and the overall performance of ESLSE in meeting time is poor. According to World

Bank (2015), a literature review indicates that timeliness of shipments in reaching destination measures how reliably shipments meet the promised delivery times. More reliable delivery will lower transit time of transport from origin to destination and will enable a greater control of costs, schedules and cargo safety.

#### 4.4.5 Competition Performance

Competition in freight market regime is an essential element for adopting globalization, an important part of freight transport multimodal development. In Ethiopia the Multimodal Transport service operated by one government owned organization ESLSE.

**Table 4.18: Descriptive Statistics Value of Competition Performance**

Var. No.	Variables	N		Mean	Std. Deviation
		Valid	Missing		
1	The multimodal transport service is competitive in terms of rendering quick and quality service with reasonable price	136	2	1.71	0.729
2	The charges being requested for dry port, terminal and warehouse services are reasonable and competitive.	134	4	2.56	0.781
<b>Average Score</b>				<b>2.14</b>	<b>0.755</b>

**Source: Survey Questionnaire, 2017**

As per the above table 4.18 two questions have been provided to evaluate competition, the mean value of 1.71 (strongly disagree) and a standard deviation of 0.729 was obtained for the multimodal transport service is competitive in terms of rendering quick and quality service with reasonable price. In regards to the charges being requested for dry port, terminal and warehouse services are reasonable scored a mean value of 2.56 and the standard deviation value of 0.781, stating that the majority of the respondents disagreed and the standard deviation value shows a closed customer response.

In summary the majority of the respondents evaluated competition as disagree with average mean value of 2.14 and standard deviation value of 0.755. This implies that the multimodal transport service is not competitive in rendering quick and quality service with reasonable price

and the charge being requested for dry port, terminal and warehouse service are not reasonable and competitive. Thus, the majority of customers are not satisfied with the monopolistic privilege of the government owned enterprise ESLSE. According to Islam (2005), a literature review shows that if there is not port and terminal competition, the quality of services is restricted and transit time and transport costs increased. On the other hand, the inland transport market is virtually enjoying an effective competitive regime, which is free from government restrictive regulation.

#### 4.4.6 Tracking and Tracing Performance

The ability to track and trace shipment is enabling transport operators and trading partners to predict the estimated time of arrival of their inbound loads and have important role in promoting multimodal transport and managing logistics networks efficiently.

**Table 4.19: Descriptive Statistics Value of Tracking and Tracing Performance**

Var. No.	Variables	N		Mean	Std. Deviation
		Valid	Missing		
1	Tracking and Tracing shipment is supported by improved computerized system	136	2	2.04	0.419
2	ESLSE provides information on the location/whereabouts of shipments or tracking information.	136	2	2.65	0.882
3	Cargos are easily located in identifiable way in dry ports and terminal	136	2	2.23	0.570
4	ESLSE provide arrival notification to its customer	136	2	3.57	0.822
5	Since the past five years the ability to track and trace shipment is improved.	136	2	3.80	0.542
6	The overall ESLSE performance on providing appropriate tracking and tracing service is satisfactory	138	0	2.87	0.895
7	The multimodal transport operation are well managed and efficient in their service	138	0	2.07	0.446
<b>Average Score</b>				<b>2.75</b>	<b>0.615</b>

**Source: Survey questionnaire, 2017**

Among the description, it was found that, ESLSE provide arrival notification to its customer and since the past five years the ability to track and trace shipment is improved as stated in table 4.19, respondents were scored a mean value of 3.57 and 3.80 and a standard deviation value of 0.822 and 0.895 respectively. These imply that the majority of the customers were agreed and the standard deviation value shows that the customers have closed response on the same issue. According to the information obtained from the interview the ESLSE provide arrival notification service to its customer by SMS to those customers registered their telephone number on the bill of lading when they open letter of credit.

On the other hand, the remaining five descriptive items on the table scored a mean value 2.04, 2.07, 2.23, 2.65 and 2.87 for tracking and tracing shipment is supported by improved computerized system, the multimodal transport operation are well managed and efficient in their service, cargos are easily located in identifiable way in dry ports and terminal, ESLSE provides information on the location/whereabouts of shipments or tracking information and the overall ESLSE performance on providing appropriate tracking and tracing service is satisfactory respectively and a standard deviation value ranging from 0.419 to 0.895 (the respondent agreeing with same issue).

In summary the majority of the respondents evaluated tracking and tracking performance as disagree with average mean value of 2.75 and standard deviation value of 0.615. This indicates that the multimodal transport service is not supported by modern technology to provide efficient service and to enable its customer to track and trace the consignment.

According to AHM and Helo (2011), a literature review reveals that without tracking system it is almost impossible to find out delivered items and often considered as lost or stolen item that causes business loss.

## CHAPTER FIVE

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter presents the summary of findings from which conclusions drawn and that would precisely answer the basic research questions of the study and recommendation to the case study company is forwarded. Finally, limitation of the study and suggestions for further study is indicated.

#### 5.1 Summary of findings

It is obvious that logistics particularly multimodal transport is the most indispensable factor for the overall growth and development of the country in line with other infrastructural activities.

The primary objective of this research was to assess the performance of Multimodal Transport Service in Ethiopian Shipping and Logistics Service Enterprise. In order to operationalised the research objective into feasible research elements, five research questions were developed. The related theoretical literatures and empirical studies issues were incorporated in this study to provide a theoretical basis for the development of the research.

For the purpose of easing the research work, the researcher has been classified the measurement dimension of the performance of multimodal transport service into two categories which is areas for policy regulation (inputs) and service delivery performance outcomes (time, cost and reliability). The first, the inputs category consists of three key dimensions which are custom, infrastructure and competence. The second, the outcome category also consists of three dimensions which are timeliness, competition and tracking and tracing. The dimensions were made mainly to assess the performance level of each input category in providing efficient, cost effective and reliable service delivery of multimodal transport service. Thus the six dimensions have been well addressed by the questionnaire and interview questions designed.

Accordingly the following major findings were found because of the data analysis of the study.

- **The demographic profiles of the respondents:** The demographic profiles of the respondent were analyzed and indicated that the majority of the respondents are educated. 55.2 % of the respondents have 1<sup>st</sup> degree, 21.6% of the respondent have diploma and 8.2% of the

respondents have above 1<sup>st</sup> degree. The analysis result of work experience indicates that 42% of the respondent served in import export between 5-10 years and 42.8% of the respondents were customer of ESLSE between 5-10 years and 28.3% of the respondent serviced in import export for more than 10 years and 27.5% of the respondent were customer of ESLSE for more than 10 years. Regarding the respondent understanding and exposure to multimodal transport system in Ethiopia, 79% of the respondents have a very good understanding and exposure to implementation of multimodal transport system in Ethiopia and regarding major change occurred in the last five years in multimodal transport service, 94.2% of the respondents were agreed to this statement.

- **Custom:** For custom performance evaluation, eight questions were provided to the respondents. As per the respondents' evaluation result, most of them were not satisfied with the current operational activities of custom as far as the six measurement questions were concerned. And for the remaining two measurement questions they have shown their agreement. The average mean and standard deviation of the total items represents 2.71 and 0.669 respectively, this implies that the majority of the responded evaluated custom performance as disagree. Thus the custom clearance process is not suitable to delivery efficient multimodal transport service.
- **Infrastructure:** In relation to the performance level of infrastructure, nine questions have been provided to the respondents. Out of the nine questions provided, the respondents scored strongly disagreed on the seven questions provided and they scored agree on two questions only. The average mean and standard deviation of the total items represents 2.18 and 0.688 respectively, this implies that the majority of the responded evaluated infrastructure performance as disagree. Thus the existing transport related infrastructure is not suitable to provide optimal multimodal transport service.
- **Competence:** For competence performance evaluation, two questions were provided to the respondents. The majority of respondents show their disagreement in regards to there is enough skill and expertise in ESLSE to operate multimodal transport service as a multimodal transport operator and they show their agreement regarding the improvement of management and employee skill during the past five years. The average mean and standard deviation of the total items represents 2.81 and 0.811 respectively, this implies that the majority of the responded evaluated competence performance as disagree. Thus the management and

employee in ESLSE have no the competence to provide efficient multimodal transport service.

- **Timelines:** In this regard, seven questions have been provided to the respondents. Out of the seven questions, they showed strongly disagree on one question, disagree on four questions and agree on the remains two questions. The average mean and standard deviation of the total items represents 2.67 and 0.718 respectively, this implies that the majority of the responded evaluated Timelines performance of ESLSE as disagree. Thus ESLSE performance on meeting scheduled or expected delivery time is poor.
- **Competition:** To evaluate the competition performance of the multimodal transport service two questions have been provided to the respondents. According to the finding, the majority of the respondents fall on strongly disagree position on one question and disagree position on the other question. The average mean and standard deviation of the total items represents 2.14 and 0.755 respectively, this implies that the majority of the responded evaluated competition as disagree. Thus the multimodal transport service is not competitive.
- **Tracking and Tracing:** For tracking and tracing performance evaluation, seven questions were provided to the respondents. As per the respondents' evaluation result, most of them were not satisfied with the current tracking and tracing service of ESLSE. Out of the seven questions provided, the respondents were scored their agreement only on the two questions and for the remaining five questions they scored their disagreement. The average mean and standard deviation of the total items represents 2.75 and 0.615 respectively, this implies that the majority of the responded evaluated tracking and tracking performance of ESLSE as disagree. Thus the multimodal transport service is not supported by modern technology to enable its customer to track and trace their consignment.
- Finally 94.2% of the respondent agreed on the improvement of multimodal transport system in the past five years in general. The improvement of the multimodal transport service in past five years on each the measurement dimension except competition (custom, infrastructure, competence, timeliness and tracking and tracing), the majority of the respondents fall on the agreed position. Regarding competition the majority of the respondents are not satisfied with the monopolistic privilege of ESLSE.

## 5.2 Conclusion

Ethiopian Shipping and Logistics Service Enterprise is the sole provider of Multimodal Transport in the country. Because of this, to provide effective and efficient service the Enterprise has to mobilize all its available resources and move toward the accomplishment of its objectives. Even though, the enterprise has made some improvements in providing multimodal transport service as compared to the previous times, much remains to be done to the following points that obtained from realized source of primary as well as secondary sources. So the researcher concludes with research evidence that the current multimodal transport service is not efficient, effective and reliable based on the six measurement criteria (custom, infrastructure, competence, timelines, competition and tracking & tracing).

The customs operation has its own impact on the multimodal transport system either by stretching or shrinking the multimodal transport transit time. As per the findings of the research it is possible to conclude that the inefficiency of the customs clearance process, excessive procedures, manual inspections, paper reviews and repetitive checks generally hinders the efficient transit of goods which worsen the role of customs office to the efficient and effective multimodal transport service.

As per the findings of the research, although Ethiopian government has been investing a large share of its development budget in transport infrastructure, the inland transport system which is an integral part of multimodal transport system of the country is entirely dependent on road transport system is not suitable for containerized door to door cargo movement. The dry ports and terminals substantially support the operation of multimodal transport service being the final destinations for incoming cargoes but as per the finding of the research, the poor infrastructure facilities and lack of enough space to accommodate all incoming and outgoing cargoes, the dry ports, terminals and warehouses have not helped the enterprise in achieving efficient and effective multimodal transport service.

Effective multimodal transport requires skill and expertise manpower in freight and logistics service sector as well as a clear focus on customer requirements. As per the research findings

ESLSE has no the required skill and expertise manpower in freight and logistics sector as a multimodal transport operator which decreases the effectiveness of multimodal transport.

Timeliness measures how reliable the shipment is in meeting the scheduled or expected delivery time. As per the research finding the overall performance of multimodal transport service of ESLSE in meeting the scheduled or expected delivery time is poor. The cargo handling time at dry port is high due to lack and shortage of modern cargo handling equipment and facilities. The dwelling time at dry ports is high because the customer is not receiving their cargo within the free times, which result in congestion of the dry ports and decrease the intake capacity of the dry ports. Thus less reliable delivery will increase transit time of transport from origin to destination and will not enable a greater control of costs, schedules and cargo safety. This becomes obstacles for customers to function in a manner that is turned into modern just in time international trade practice. Accordingly, the current multimodal transport service lacks reliability in meeting time.

Ethiopia has a multimodal transport service with a complete dominance of the government owned enterprise monopoly with no private competition. As per the finding of the research, this the monopolistic privileges of the multimodal transport service by ESLSE hampers market oriented implementation, restrict the quality of services and increase transit time and transport costs.

Finally the research findings confirmed that the tracking and tracing activities and the location of cargo at dry ports are not supported by modern or automated technology. Thus the customers are unable to track and trace their shipments. The inability to track and trace shipment becomes obstacles to the customers to predict the estimated time of arrival of their shipments and which lead inability to manage logistics networks efficiently.

As a general conclusion standing from the research findings, the multimodal transport have not reached to the level of efficiency, cost effective and reliable service by acquiring skilled and expertise manpower in freight and logistics sector, infrastructure, automated or modern technology, modernized cargo handling equipments and facilities required to render multimodal transport service.

### 5.3 Recommendations

The Ethiopian Shipping & Logistics Service Enterprise as a multimodal transport operator can use the findings of this study to identify the most important dimensions which contribute much in efficient, effective and reliable service delivery to their customers. In relation to the finding, the researcher came up with the following recommendations.

- Ethiopian government, as infrastructure provider, better invest on road, railway, dry port and terminal infrastructure in line with multimodal transport service to ensure efficient and effective performance of multimodal transport service.
- Ethiopian government, as regulator, running digital scanning machine at dry ports to reduced custom process time.
- Use of railway transport which may be the efficient and the least cost mode of transport with less logistic problem with respect to inland road transportation.
- Equipping the dry ports, terminals and warehouse with highly modernized loading/unloading machineries so that the cargo handling time at the dry ports minimized.
- ESLSE need to enhance the inland transport by acquiring latest fuel efficient and high volume vehicles.
- The ESLSE is recommended to provide a timely and fundamental capacity building program like develop integrity with customer, training and upgrading of the employees professional qualification.
- Opening a higher institution/training center for freight and logistics service sector so that the sector will have numerous trained and intellectuals on the current modernized logistics service.
- ESLSE as a multimodal transport operator recommended coordinate their service with custom authority in facilitating efficient and effective delivery of goods.

- Create more awareness to the multimodal transport customers who have many containers on the dry ports to clear out their containers to reduce the average dwelling time of imported containerized goods at the dry port.
- In order to encourage spirit of competition between the private operators and the government owned multimodal transport operator (ESLSE), the government should participate or work together with the private sector such as importers and local societies to get the better output of the “multimodal” transport system, it should not be monopolized.
- Implementing modernized technologies such as Electronic Cargo Tracking System (ECTS) in order to provide efficient tracking and tracing service.
- Private companies should be encouraged to invest in information technology (IT) relevant to their activity in import export trade sector.

#### **5.4 Limitations and direction for future study**

The research aimed to assess the performance of multimodal transport service in Ethiopian Shipping and logistics service Enterprise. The scope and findings of the research were limited in the following ways:

- The study focused on containerized cargo, as a precondition for multimodal transport system. Thus the issues of vehicles, break bulk and other types of cargo have not been considered.
- The study mainly focused on multimodal transport system of import containers. Thus the export cargos have not been considered in this study.
- The study did not include the legal and safety & security aspects of multimodal transport system.

## REFERENCES

- AHM Shamsuzzoha and Petri T Helo (2011). Real-time Tracking and Tracing System: Potentials for Logistics Network, Department of Production, University of Vaasa, Finland.
- Alderton, P M (1995). Sea Transport, Operation and Economics. Surrey, Thomas Reed Publications.
- Ashar, A. (1999). The Fourth Revolution, in Containerization International.
- Banomyong, R. (2000). Multimodal transport in South East Asia, A Case study Approach. PhD Thesis, Department of Maritime Studies and International Transport, Cardiff University.
- Bhattacharjee A. (2012). Social Science Research: Principles, Methods, and Practices. Florida, Creative Commons Attribution.
- Bowersox, J.D. and Closs, J.D. (2000). Logistics Management, New Delhi: Tata McGraw- Hill Publishing Company Ltd.
- Breda, H.M. (2009). Multimodal transport law, Netherlands.
- Burkhardt, M. (1998). Combined Perspective for Road and Rail, in: New Trade Patterns: New Transport Demands in the Black Sea Region, Antalya, Turkey.
- Campisi, D. and Gastaldi, M. (1996). Environmental protection, Economic Efficiency and Intermodal Competition in Freight Transport, Transportation Research Part C, Vol. 4.
- Coyle, J. J., and Bardi, E. J., and Langley, C. J. Jr. (2003). The Management of Business Logistics, UK: West Publication Co. Seventh Edition.
- Castro, C F (1996). Trade and Transport Facilitation: Review of Current Issues and Operational Experience. A Joint World Bank / UNCTAD Publication., Logistics, UK.

- Chinniah Anbalagan and Kalimuthu Kanagara (2014). Problems and Prospects of Transport in Ethiopia- Special Reference with Auto Rickshaw's (Bajaj) in Hawassa City, SNNPRS, East Africa.
- Debela, M. Fekadu (2013). Logistics Practices in Ethiopia. Independent thesis: Swedish University of Agricultural Sciences Department of Energy and Technology
- D'Este G. (1996). An Event Based Approach to Modeling Intermodal Freight System, in International Journal of Physical Distribution and Logistics Management.
- Eno Transportation Foundation, Inc. (1998). Toward Improved Intermodal Freight Transport in Europe and the United States: Next Steps, Jointly Sponsored by European Commission Directorate -General VII (Transport); U. S. Department of Transportation, Office of Intermodalism and Federal Highway Administration, Munich, Germany.
- Eno Transportation Foundation, Inc. (1999). Toward Improved Intermodal Freight Transport in Europe and the United States: Report of the Third EU-US Forum' jointly sponsored by European Commission Directorate-General VII (Transport); U. S. Department of Transportation, Office of Intermodalism and Federal Highway Administration, New York.
- Ethiopian Maritime Affairs Authority (2014). Program for Availing Additional Capacity for Handling MTO Cargo from Djibouti, Addis Ababa. (Unpublished)
- Ethiopian Shipping and Logistics Services Enterprise.(2016). ESLSE Statistical Bulletin. (EFY 2000-2007), Addis Ababa. (Unpublished)
- Faust, P. (1985). "Multimodal transport" in Beth, H.L. (Ed.), Port Management Textbook - Containerization, Bremen: Institute of Shipping Economics and Logistics, Borsenhof A, Am Dom.
- Federal Negarit Gazeta (2007). Council of Ministers Regulation No.136/2007: Council of Ministers regulation to establish the dry port services enterprise. Brehanena Selam Printing Press, Addis Ababa.

- Federal NegaritGazeta (2007). Marine Sector Administration Proclamation No.549/2007, Brehanena Selam Printing Press, Addis Ababa.
- Federal NegaritGazeta (2007). Multimodal Transport of Goods Proclamation No.548/2007, Brehanena Selam Printing Press, Addis Ababa.
- Federal NegaritGazeta (2007). The Ethio-Djibouti Multimodal Transport System Agreement Ratification Proclamation No.520/2007, Brehanena Selam Printing Press, Addis Ababa.
- Federal Negarit Gazeta (2011). Council of Ministers Regulation No.255/201, Council of Ministers regulations to establish the Ethiopian Shipping Logistics Services Enterprise, Brehanena Selam Printing Press, Addis Ababa.
- Fortune Newsletter (2012). Government of Ethiopia Evaluating Technical Proposals from Six International Companies on the Multimodal Transport System.
- Foster, N. (2003).International Trade and Economic Growth in Developing Countries University of Nottingham, in: <http://www.nottingham.ac.uk/economies/ila/foster.pdf>, last accessed on Jan. 3, 2017.
- Gulyani, S. (2001). Effects of Poor Transportation on Lean Production and Industrial Clustering: Evidence from the Indian Auto Industry, in: World Development.
- Hayuth, Y. (1987). Intermodality, Concept and Practice, Lloyd's of London Press, London.
- Hilling, D. (1996). Transport and Developing Countries, UK: Routledge, London.
- Islam, D.M.Z., Dinwoodie, J. and Roe, M. (2005).Towards supply chain integration through multimodal transport in developing economies: The case of Bangladesh, Maritime Economics and Logistics.
- James A. Black and Dean J. Champion (1976). Methods and. Issues in Social Research, John Wiley & Sons, Inc., New York
- John T. Mentzer (1986). The Evolution of Logistics Concept, Journal of Business Logistics, University of Tennessee.

- Kothari, C.R.(2004). Research Methodology: Methods & Techniques New Delhi: New Age International (P) Ltd., Publishers
- Mahoney, J H, (1986). Intermodal Freight Transpiration, Washington DC.
- Muller, G. (1999). Intermodal Freight Transportation, the U. S.: Eno Transportation Foundation, Inc. and Intermodal Association of North America, 4th Edition.
- Mulligan, R. M. (1999). EDI in Foreign Trade, Case Studies in Utilization, International Journal of Physical Distribution & Logistics Management, American International University, London.
- Ockwell, A. (2001).Benchmarking the Performance of Intermodal Transport, OECD Division of Transport.
- Private Sector Development Hub/Addis Ababa Chamber of Commerce and Sectoral Association (2009), The Management of Commercial Road Transport in Ethiopia.
- Roberts, P. O. (2004). Supply Chain Management: New Directions for Developing Countries, SAIC, in: [http://www.worldbank.org/transport/ports/trf\\_docs/new\\_dir.pdf](http://www.worldbank.org/transport/ports/trf_docs/new_dir.pdf), last accessed on Jan. 3, 2017.
- Roscoe, J.T. (1975). Fundamental Research Statistics for the Behavioural Sciences, 2nd edition. New York: Holt Rinehart & Winston.
- Ruth Banomyong (2000). Multimodal Transport Corridors in South East Asia: Thesis: University of Wales Sekaran, Uma.
- Simon, D. (1996).Transport and Development in the Third World, (UK, London).
- Sino-Dutch Joint Committee (1998). Master Plan Study Report: Sino-Dutch Joint Research on the Yangtze River Basin Intermodal Transport Project. State Planning Commission of the People's Republic of China and Ministry of Transport, Public Works and Water Management of The Netherlands.

- SLA. (2008). Multimodal Transport: the practitioner's definitive guide / Singapore Logistics association with Cheong Yun Wan in Consultation with Stanley Lim and Thomas Sim, SNP International Publishing. Singapore.
- Temple, F.T. (2003), Reforms and Socio-Economic Performance in Bangladesh, in the seminar on Accelerating Growth & Poverty Reduction in Bangladesh Organized by Dhaka University and World Bank, Dhaka.
- The World Bank (2015). Trade and Competitiveness Global Practice, the logistics Performance Index, Washington, DC.
- Vanroye, Karel; Blonk, Wim A. G. (1998). The creation of an information highway for intermodal transport, Maritime Policy & Management.
- United Nations Conference on Trade and Development/UNCTAD Secretariat (1979). Establishment of Multimodal Transport Operators in Developing Countries. New York, United Nations.
- United Nations Conference on Trade and Development/UNCTAD. (1981). United Nation Conference on a Convention of International Multimodal Transport, Geneva.
- United Nations Conference on Trade and Development/UNCTAD Secretariat (1984). Multimodal Transport and Containerization - Guidelines on the Introduction of Containerization and Multimodal Transport and on the Modernization and Improvement of the Infrastructure of Developing Countries. New York: United Nations.
- United Nations Conference on Trade and Development/UNCTAD Secretariat (1994a). Mega Multimodal Transport Operators & Mega Carriers. New York: United Nations.
- United Nations Conference on Trade and Development/UNCTAD Secretariat (1994b). Multimodal Transport and Trading Opportunities. New York: United Nations.
- United Nations Conference on Trade and Development/UNCTAD.(1995). Multimodal Transport Handbook for Officials and Practitioners.

- United Nations Conference on Trade and Development /UNCTAD (2003). Development of Multimodal Transport and Logistics Services, Geneva.
- University of Florida (2014). Determining Sample Size, in: <http://www.sut.ac.th>, last accessed on March 25, 2017.
- Waters D. Global Logistics (2010). New directions in Supply Chain Management, the Chartered Institution of Logistics & Transport, UK.
- Wood Donald F, Barone Anthony P, Murphy Paul R, Wardlow Daniel L. (2002). International Logistics 2nd Edition, American Management Association (USA).
- WOXENIUS, J. (1998). Inventory of Transshipment Technologies in Intermodal Transport, Study for the International Road Transport Union (IRU), Geneva.
- Xu, Guibin (1999). Multimodal transport and trade facilitation: implications in the Chinese context. World Maritime University.
- Zeng, A. Z. and Rossetti, C. (2003). Developing a Framework for Evaluating the Logistics Costs in Global Sourcing Processes - an Implementation and Insights, International Journal of Physical Distribution and Logistics Management.
- Zinn, W., Mercosur (1999). A Preliminary Assessment of the Transport Infrastructure Supporting Supply Chain Efficiency, in: World Bank/ UN-ESCAP Regional Technical Workshop on Transport and Transit-Facilitation, Bangkok.