



Addis Ababa University

School of Commerce

Department Of Logistics and Supply Chain Management

**The Role of Transportation Facility in Boosting the Logistics Supply
Chain Management Performance: The Case of EthioTelecom**

**A Research Paper in partial fulfillment of the requirements for the Degree of
Masters of Art in Logistics and Supply Chain Management, Addis Ababa
University School of Commerce**

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SCHOOL OF COMMERCE
DEPARTMENT OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT**

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**BY
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DECLARATION

I the undersigned, here declare that, this thesis is my original work and has not been presented for a degree in any other researcher or University, and that all the sources of materials I used for the thesis have been duly acknowledged as own resources based on the research ethics.

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CONFIRMATION

This is to approve that the study made by Tilahun Lulseged, entitled: **The Role of Transportation Facility in Boosting The Logistics Supply Chain Management Performance; Case of Ethio-Telecom Company**, and submitted in partial fulfillment of the requirements for the Degree of Masters of Arts in Logistics and Supply Chain Management complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

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ACRONYMS

AAU-Addis Ababa University

CSCMP -The Council of Supply Chain Management Professionals

ITT -In-transit time

ITTV- In-transit time variability

DTT- Delayed in traffic time

LSC- Logistics Supply Chain

OTAP -On-time arrival percentage

OTDP- On-time departure percentage

PDP -Perfect delivery percentage

PRP -Perfect Route Percentage

PCC- Parsons Correlation Coefficient

RBV -Resource Based View

SCM- Supply Chain Management

SFD-Sourcing and facilities division

SPSS-Statistical Package for Social Sciences

TCE- Transaction Cost Economics

VL/UT- Vehicle load/unload time

Abstract

Transportation plays important role in Logistics supply business function and in the general company's performance through the planning, implementation and management as well as effective control of processes linked to distribution of materials, production inputs, information and financial flows of an organization. The main objective of this study was to examine the Transportation plays important role in Logistics supply chain performance in the case of Ethio telecom with respect to logistics Supply management practices and their performance i.e. Organizational performance, Competitiveness, Logistics Efficiency, Logistics Effectiveness, Logistics Differentiation, Customer Satisfaction, Profitability of Business and Timely delivery of Inputs/ Products. Descriptive and explanatory research designs as well as quantitative research approach were employed in conducting the study. The population of the study was employees of Ethio telecom working in warehouse, procurement, fleet operation, facilities, inventory and goods shipment from which the sample was drawn. Stratified random sampling was used to select the appropriate sample of the study. Data was collected using questionnaires and analyzed using SPSS. Descriptive analysis namely percentage, mean and standard deviation; and inferential analysis namely Pearson correlation and multiple linear regression were employed. The study indicated that enhanced transportation facility use has significantly boosted logistics supply management performance in Ethio telecom to a reasonable account.

The study revealed that logistics supply chain management practice and its performance which contributed to Ethio telecom organizational logistics supply chain performance efficiency, because of the differentiation and effectiveness of transportation by enabling timely delivery inputs and product services to a larger extent. The study also showed that there was significant positive relationship The study also revealed that Ethio telecom faced logistics Supply Chain management quality and yet not fully utilized its logistics supply system as a result moderate level transportation facilities. The study recommended to enhance the logistics Supply management practices and boost overall business preface, the organization has to optimize the use of efficient transportation facilities, reduce level of logistics supply service and delivery cost.

Key words: *Transportation role, Logistics, supply chain management, performance*

CHAPTER ONE

Introduction

1.1 Background of the study

Transportation takes a crucial part in the manipulation of logistics supply management processes. Logistics has been described as being important for integrating the internal operations of an organization with the supply chain processes to increase customer satisfaction. As a strategic necessities to pursue in today's globally competitive business environment and become a winner in a perpetually fast paced market climate of global economic complexities, firms are primarily looking at securing cost, ensuring quality relying on technological innovations and other competitive advantages. This has placed high pressure on the holistic business activities whether they are local or international. As such, logistics become the key factor for proper operations of profitable businesses as it integrates all the functional entities across a company. In effect, for meeting the increasing demands of logistics services, the properly functioning transportation facility become the essential prerequisite to functionally surface the needs of logistics supply in a cost effective way without compromising the quality of the services or products.

Without well-developed transportation systems, logistics could not bring its advantages into full play. Logistics was initially of a military activity concerned with getting soldiers and munitions to the battlefield in time for flight, but it is now seen as an integral part of the modern production process. The main background of its development is that the recession of America in the 1950s caused the industrial to place importance on goods circulations. The term, logistics, was initially developed in the context of military activities in the late 18th and early 19th centuries and it launched from the military logistics of World War II. The probable origin of the term is the Greek *logistikos*, meaning 'skilled in calculating'. (BTRE, 2001) Military definitions typically incorporate the supply, movement and quartering of troops in a set. And now, a number of researches were taken and made logistics applications from military activities to business activities.

Transport system is the most important economic activity among the components of business logistics systems. Around one third to two thirds of the expenses of enterprises' logistics costs

are spent on transportation (Chang, 1988). Logistics encompasses entire process of materials and products moving into, within and out of firm. Inbound logistics covers the movement of material to the firm. Materials management describes the movement of materials and components within a firm. Physical distribution refers to the movement of goods from point of production to end customers .The movement of goods from the supplier to the manufacturing plant, within the compound of the plant, from the warehouse to the factory, from the factory to the warehouse, from the warehouse to the distributors and final customers all requires the service of the transportation unit at each and every of the activities involved (Srinavas, 2001).

Transportation involves safe, efficient, reliable and sustainable movement of persons and goods over time and space. It is an important supply chain driver because products are rarely produced and consumed in the same location. At the heart of logistics are transport vehicles moving goods between suppliers and customers up and down the supply chain it also moves a products to the next stage of business process and transportation is vital to procurement, manufacturing, & marketing plays a key role in the performance of logistics it enables most commercial activities to function it consumes time, financial, and environmental resources even if it serves as product. Logistics has been described as being important for integrating the internal operations of an organization with the supply chain processes to increase customer satisfaction. All the supply management processes which can affect logistics and customer satisfaction and reported that a logistical value proposition and logistics have a big impact on customer satisfaction leveraging on order processing, inventory management, transportation, handling and packaging, as well as facility network design (Chiarini, 2015).

Logistics plays key role in supporting organizations as they strive for more efficient management systems as in the business practices, the inefficient logistics system together with the inefficient internal management would disable the organization to respond to the needs of customers with the lowest price at the shortest feasible time frame including the quality level which does not meet customer expectation and would lead the organizations to the competitive disadvantage situation against their rivals (Nyaberi and Mwangangi, 2014).

The ability to transport goods quickly, safely, economically and reliably (logistics) is seen as vital to success of businesses, and to a nation's prosperity and capacity to compete in globalized

economy (Fekadu, 2013). Thus, logistics is vital element to improve both profitability and competitive performance of a firm (Hajiesmaeili, 2016). Logistics has become a fundamental factor for the generation of competitive advantages and creation of value, through the planning, implementation and control of processes linked to physical flows, and the integration of processes along the supply chain (Alarcon &Antun, 2013). On one hand, the efficient management of the key and supporting logistical processes allows reduce the costs related to the goods flow through the supply chain, the production and physical distribution costs, and especially the storage, inventories and transportation costs. On the other hand, the capacity for putting a product in the place and at the time where a demand exists, satisfying the clients' requirements before its competitors can do (Alarcon &Antun, 2013).

Logistics plays an important role in facilitating the flow of goods in and out of the company. The company need to facilitate the smooth flow of incoming raw materials (inbound) to the company with the aim to facilitate the operations. The proper inbound management will impact several aspects in the company, such as, on production schedules, distribution effectiveness, customer satisfaction and firm performance (Muslimin,2015). In fact, despite the role of logistics facilitating the incoming flows, logistics is also facilitating the outcome delivery. This role of logistics is expected to provide a better improvement of the quality of raw materials and the accuracy of the amount of raw material by the company. In other words, the logistics role should optimize the flow of goods in order to maintain quality, on time delivery and satisfaction. Therefore, the capability of logistics to manage both these flows will enhance the value added and have an impact on maintain the business performance (Muslimin,2015).

Consequently, the proper operation of transportation and determines the efficiency of moving products and the raw materials of production. The progress in techniques and management principles improves the moving load, delivery speed, service quality, operation costs, the usage of facilities and energy saving. Transportation takes a crucial part in the manipulation of logistics. Reviewing the current condition, a strong system needs a clear frame of logistics and a proper transport facilities to link the producing procedures (Yung-yu TSENG, 2005).

Due to the trend of nationalization and globalization in recent decades, the importance of logistics management has been growing in various areas. For industries, logistics helps to optimize the existing production and distribution processes based on the same resources through management techniques for promoting the efficiency and competitiveness of enterprises. Logistics management thus believed to boot the company's supply chain and help to improve the company's financial and market performance through delivering its services in the desired time and quality at the right place and at a reasonable cost to the final consumers.

SCM is progressively recognized as a key and vital corporate strategy, which links both suppliers and customers in order to enhance overall service flexibility. Besides, successful SCM is a prominent tool to reduce cost of operation by eliminating all nonvalue added activities in the flow of various kinds of materials from supplier to end customer (Chan and Lee, 2005). A service Supply Chain involves the series of activities from the analysis of customer need, service design to service delivery (Mohan and Zailani, 2010). It is the conglomeration of various supply chain aspects in service sector.

Thus, to instill the versatile supply of logistic services, efficient transportation is very essential for ensuring the company's day to day business operation. The purpose of this paper is to re-clarify and redefine the position relationship between transportation and logistics systems through collecting and analyzing various supply chain management application cases of Ethio telecom Company thereby will have to draw the learning points from its best practices in the logistics supply systems performance and in the improvement of the general organizations services.

1.2 Statement of the problem

Effective transportation management keeps a company's whole supply chain running smoothly. With successful transportation execution, inventory can be kept lean and can be moved in and out of a warehouse quickly and efficiently. This improves warehouse efficiency, reduces overall lead time and saves money on storage. Supply chain disruptions can be costly while hurting customer satisfaction and loyalty. Thus, creating an effective inventory flow through transportation avoids damages often caused by the disruption as a result of the use of ineffective transportation facilities.. Among the major problems contributing for the poor performance of the industry are as such, use of poor transportation facilities, lack of adequate knowledge and personnel skills in operation of transportation facilities in managing logistics practices are the critical ones (LIDI Annual report, 2013).The problems are related with the logistics operations are thus both human and non-human factor as well. The human factor is related with poor performance of some of the employees in transport area as a result of negligence, not understanding the value of team work and inadequate training.

Accordingly, the inadequacy, unreliability and poor quality of transportation facilities hinders the proper logistics supply management, and therefore become one of the serious problems that impeded the efficiency of logistics across the operation roots of the company causing delayed performance. Although some researchers has tried to address the issue of transportation in logistic chain performance, the issue of delivery speed, service quality, operation costs, the usage of facilities and energy saving were not discussed in depth by the pervious researchers. For instance, the study by Fekadu (2013) on logistics practices of Ethiopia was mainly focused on the transportation and customer service practices using general attributes of infrastructure, performance, information system, human resources, business and political environments. His study only indicated that Ethiopian logistics supply system is characterized by poor logistics supply practices and lack of coordination of good transport facilities, low level of development of logistics infrastructure. He did not investigated the link between the roles of efficient transportation in the perspective of supply chain management in a more general context by case taking a medium and large scale industries. My research theme thus differs from his because my study takes an account of transportation role in Supply chain management of the logistics in a specific company's business operation, which is Ethio telecom.

Therefore, this study tries to address the essential problems related to the transport facilities and the difficulties that logistics supply chain management faced by Ethio telecom as a result as an integral parts of the company's business atmosphere. Thus this study takes into account of investigating the interplay between the transportation facilities utilized and the logistics operation in line with the supply chain management linking it to the pivotal roles of transportation in boosting performance of the company's supply system. Reviewing the current condition, the researcher believed a strong system needs a clear frame of logistics supply chain and a proper transport operation to link the efficient producing procedures for the profitability of Business Company. Therefore, as per the different research reviews shown, there has not been in depth study has been conducted as to whether the transportation facility can have an undulating effect on the logistics management practices and also can affect the general business performance of Ethio telecom. This study therefore, intended to fill these gaps by examining the effect of transport facility in logistics supply chain management practices on organizational performance of Ethio Telecom Company. This has motivated the researcher to specifically fill these identified gaps which were not discussed and addressed by the earlier research works.

As business enterprises find themselves under growing pressure of demand and competition from both customers and shareholders in a fast pacing global business markets, it needs to seek ways in which to decrease their costs while at the same time increasing performance. Thus, they are forced to find ways in which they may improve the efficiency and effectiveness of their logistics supply chain operations. However, as per the pre-review of the company's operation, Ethio telecom did put on improving the services networking technologies and put thus less attention on the logistics operation and transportation as a factors of business profitability and customer satisfaction determinant as such. As a result, the role of logistics has not received the attention it deserves in terms of considerable influence that it can contribute to meet the company's objective. Therefore, researching the state of transportation facility to boost supply chain performance in Ethio telecom is necessary to overcome such problems and to enhance the attention given to the transportation facilities and logistics supply chain management.

In addition, even if Ethio telecom is a monopoly public enterprise that do not encounter stiff market competition, government expects the company to avail full range of coherent telecom products and service for all the public and to curb recurrent quality of service problems to meet the increasing demand for mass telecommunication across the nation. This requires the company to be efficient and effective in its operation and therefore logistics supply can play an important role in company's overall performance enhancing the proper planning, implementation and control of processes linked to physical flows or transportation of goods, telecom materials, equipment and machines integrating all the processes and inputs along the supply chain by ensuring timely delivery of supplies. Thus, this study redefines the role efficient transportation plays in logistics operational quality logistics services meet the operational standard of the company.

Like a portion of transport efficiency, inventory must be periodically reviewed at fixed intervals and if there has been any depletion in consumption between the last and present review period, a replenishment order need to be placed to bring the supply as per the customers' demand, for which adequate transportation facility is a precondition. In similar study, Mengistu identified that the success of the company's overall inventory management practice. In this line, his study found out that the respondents have replied that the organization exceeded expectation were only 35(17.96 %) replied the company meets expectation were 116 (59.48 %) replied the company feel short of expectation, and the rest 44 (22.56 %) respond that the organization is unable to determine at this time. This implies the inefficiency of Telecom transportation facilitation and ineffective inventory practices both of which are the backbones of the profitability of the Telecom business are now becoming a challenges facing the Ethio telecom.

However, as stated in the above data, in regard to the transportation facilities efficiency on inventory management practice, his study explicitly costs are not explicitly considered by Ethio telecom and order quantity is not fixed as per the study conducted by Mengistu Guliti(2018). Accordingly, time needs to be taken into consideration and given more emphasis on the transportation of logistics supplies as per the definite period stated by the Ethio telecom.

This research therefore indicated the direction for further improvement in the proper use of transportation facilities in logistics supply management process of the supply side of the Telecom Company. Henceforth, this research is essentially believed to assist logistics managers, Supplies Operations department leaders, researchers and transportation planners to define and comprehend the basic views of roles of transportation facility has had on logistics supply management and its various applications in relation to boosting efficiency of logistics operations.

1.3 Objectives

1.3.1. General objectives

The general objective of this study is to assess the role of transportation facility in boosting logistics supply chain management performance in the headquarter supplies operations of Ethio Telecom.

1.3.2. Specific Objectives

The specific objectives of the study are:

- To examine the roles transportation plays in regard to the logistics supplies management policy of the company
- To assess the existing practices of transportation facilities utilized for supplies logistics by Ethio Telecom
- To identify factors affecting effective transportation investigating the level of efficiency of Logistics supply management
- To pinpoint the transportation drawbacks as an element of logistics supply might have impeded the business operation of Telecom industry so as to forecast possible solutions

1.4. Research questions

1. What are the roles transportation plays in implementation of the logistics supplies management policy of the company?
2. What are the existing practices of transportation facilities utilized for supplies of logistics by Ethio Telecom?
3. What factors affect effective transportation investigating the level of efficiency of Logistics supply management performance of Ethio-Telecom Company?
4. How far the transportation drawbacks as an element of logistics supply might have impeded the business operation of Telecom industry?

1.5. Significance of the study

Key activities which are central to the logistics operation of every firm involve transportation. In Ethio Telecom, where logistics effectiveness have a great deal of impact on productivity as well as customer satisfaction. It is essential to identify areas of operation like transportation as many activity are related with transportation service in order to identify the role of transportation service have on logistics operation of the company in order to give some solution to problems faced by the company. This study is also helpful to benefit the customers of the company as the findings suggested possible solutions for problems in the transportation and logistics management section which in turn impact on the cost, quality and timeliness of company's supplies delivery, increasing productivity and customer satisfaction.

The company thus would be able to improve the logistics supplies efficiency and productivity as a result of this research as a guidance. The study is also helpful as an indication for further area of research by incorporating other factors to the study in order to see transportation role not only in logistics chain but also other areas of company's operations. Thus this study will create an enabling environment for the company to give an emphasis for its transportation and logistics management practice to enhance its organizational performance. It will also give an insight for those who wish to replicate the findings of the study on related areas.

1.6. Scope of the Study

The study is delimited geographically to only Adiss Ababa Ethio-Telecom main office which is located around 'Churchill Road' only because it would be too broad and difficult to manage if the researcher tries to look into every sectors of Ethio Telecom which is found in different regions. In addition, the researcher focused on participants from the Ethio-Telecom main office to collect the data from the logistics managers and staffs, operations division workers and transportation planners to define and comprehend the key views of the company's logistics supply systems, its various applications as well as the relationships between logistics supply systems and roles of transportation facilities efficiency.

Conceptually, the study is delimited to assessing; the role of transportation facility on logistics chain performance by identifying factors or problems that hinder transportation from playing a healthy role in logistics especially supply and logistics services supplies functions and its management performance. Methodologically, it is delimited to mixed research design that constitute numerical data mean and standard deviation and qualitative data that is descriptive and analytical.

1.7. Limitation of the study

This study have certain limitations as an attribute of social and behavioral sciences. Since the research is strictly confined to The Role of Transportation facility in boosting Logistics Chain Performance in the Case of Ethio-Telecom. The researcher has faced a difficulty in finding adequate reliable sources of data that deal with the issues under investigation. The study was limited to the willingness and cooperation of the respondents to give information during the data collection process in which about 5 individuals did not return the questionnaire. Time and Financial Constraints are also the major limitations of the study. Finally, in spite of all the limitations, the researcher admits that it was a challenge and a fascinating experience for the researcher to have a touch in the domain of Logistics and supply chain management research, insisting transportation facility as a factor. The outbreak of the COVID-19 Pandemic and the State of Emergency proclaimed by the government is another factor which impeded the personal encounter affected the quality of the some data by limiting the social distance at a reasonable distance.

1.8. Organization of the Study

The study is organized into five chapters. Chapter one discusses Introduction and the background of the study followed by statement of the problem and continues with and objectives, the research questions and the scope, limitations of the study, significance of the study and the organization of the study. Review of Related literatures and conceptual framework of the study theme were covered in chapter two. Chapter three contained the methodology used in the study. Chapter four presents the analysis of findings, its interpretation and Discussion of results. Chapter five deals with the Conclusions, Implications and Recommendations of the Study.

CHAPTER TWO

Review of Related literatures

2.1 Introduction

This chapter of the study describes the relevant literatures. It explains the history and overview of advancement of logistics, Transportation, Logistics Practices and Supply chain Management, Roles of transportation in boosting logistics supply performance, logistics supply chain management performance, theoretical review, empirical literature reviews and as well as conceptual framework of the study.

2.2 overview of Transportation, Logistics and Supply chain

The application of latest and integrated transportation methods, technologies and usage accelerates information exchange and communication times and serves as the basis for the application of cross-company planning and control approaches. These targeted collaborative activities reduce planning, handling and transport efforts in all supply chain parts and thus, positively influence the different lead time parts, such as transport time and production time (Julia Christine Bendul, 2012).

Logistics and supply chain management are not new ideas. From the building of the pyramids to the relief of hunger in Africa, the principles underpinning the effective flow of materials and information to meet the requirements of customers have altered little (Christopher, 2011). Logistics is generally the detailed organization and implementation of complex operations. In a general business sense, logistics is the management of the flow of things between the point of origin and the point of consumption in order to meet requirements of customers or corporations. The resources managed in logistics can include physical items, such as food, materials, animals, equipment and liquids, as well as abstract items, such as time and information. The logistics of physical items usually involves the integration of information flow, material handling, production, packaging, inventory, transportation, warehousing, and often security (ibid).

On the other hand Johnson and Wood's definition (cited in Tilanus, 1997) uses 'five important key terms', which are logistics, inbound logistics, materials management, physical distribution, and supply-chain management, to interpret. Logistics describes the entire process of materials and products moving into, through, and out of firm. Inbound logistics covers the movement of material received from suppliers. Materials management describes the movement of materials and components within firm. Physical distribution refers to the movement of goods outward from the end of the assembly line to the customer. Finally, supply-chain management is somewhat larger than logistics, and it links logistics more directly with the user's total communications network and with the firm's engineering staff.

Council of Logistics Management (1991) defined that logistics is 'part of the supply chain process that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet customers' requirements'. Johnson and Wood's definition (cited in Tilanus, 1997) uses 'five important key terms', which are logistics, inbound logistics, materials management, physical distribution, and supply-chain management, to interpret. Logistics describes the entire process of materials and products moving into, through, and out of firm. Inbound logistics covers the movement of material received from suppliers. Materials management describes the movement of materials and components within a firm. Physical distribution refers to the movement of goods outward from the end of the assembly line to the customer. Finally, supply-chain management is somewhat larger than logistics, and it links logistics more directly with the user's total communications network and with the firm's engineering staff.

Early references to logistics as a word are found preliminary in military applications. It is found in 1898 that logistics is discussed as, "Strategy is art of handling troops in the theatre of war; tactics that of handling them on the field of battle... The French have a third process, which they call logistics, the art of moving and quartering troops..." (Galindo, 2016). Initially Logistics was a military activity concerned with getting soldiers and arms to the battlefield, but it is now seen as an integral part in the firm's production process to carry raw-materials, semi-finished goods and finished goods to market and customer's (Kumar and Shirisha, 2014).

The commonality of the recent definitions is that logistics is a process of moving and handling goods and materials, from the beginning to the end of the production, sale process and waste disposal, to satisfy customers and add business competitiveness. It is ‘the process of anticipating customer needs and wants; acquiring the capital, materials, people, technologies, and information necessary to meet those needs and wants; optimizing the goods- or service-producing network to fulfill customer requests; and utilizing the network to fulfill customer requests in a timely way’ (Tilanus, 1997). Simply to say, ‘logistics is customer-oriented operation management’. All the supply management processes which can affect logistics and customer satisfaction and reported that a logistical value proposition and logistics have a big impact on customer satisfaction leveraging on order processing, inventory management, transportation, handling and packaging, as well as facility network design (Chiarini, 2015).

As different studies indicated, firms adopt different strategies to enhance their performance. According to Bagshaw (2017), logistics management can be one of those strategies crucial for firms to obtain higher performance. Realizing the importance of logistics management was critical for competitive advantage because operational performance had a positive impact on companies’ financial performance (Tilokavichai et al., 2012). A key determinant of business performance nowadays is the role of the “logistics function” in ensuring the smooth flow of materials, products and information throughout a company's supply chains (Kilasi et al., 2013).

Thus, Logistics was initially a military activity concerned with getting soldiers and munitions to the battlefield in time for flight, but it is now seen as an integral part of the modern production process. The main background of its development is that the recession of America in the 1950s caused the industrial to place importance on goods circulations. The term, logistics, was initially developed in the context of military activities in the late 18th and early 19th centuries and it launched from the military logistics of World War II. The probable origin of the term is the Greek *logistikos*, meaning ‘skilled in calculating’. (BTRE, 2001) Military definitions typically incorporate the supply, movement and quartering of troops in a set. And now, a number of researches were taken and made logistics applications from military activities to business activities.

2.2.1. Transport Planning and Logistics Supply Policy

Since transportation is capable of producing significant benefits, but giving rise to many negative externalities, appropriate policies need to be devised to maximize its benefits and minimize its inconveniences. The allocation, design, and construction of transport infrastructure and services must be subject to careful planning, both by public and private agencies. A distinction must be drawn between policy and planning since the former usually relates the strategies and goals while the latter refers to concrete actions. Because they both must reflect the fundamental changes in society and contemporary issues and problems, policies and planning are constantly changing. For instance, the changing orientation of public policy led to deregulation in many transport sectors. Among the core policy issues, transport safety and security have come at the forefront. Natural and anthropogenic disasters are also serious challenges in transport planning (Stopher, P. and J. Stanley (2014).

Because transportation systems are involved in a wide variety of scales and modes, from local public transit to global maritime shipping, it tends to be partitioned. It is indeed difficult to reconcile perspectives such as pedestrian mobility issues or the selection of air cargo hubs by a freight forwarder. Multidisciplinary approaches remain at the core of transport geography simply because its modes are at the same time independent but interconnected at different scales. Irrespective of the scale and the mode, transport geography shares several common issues and challenges Cervero, R. and G. B. Arrington (2008).

Transportation is growing in significance and changing in the face of challenges and drivers of change, such as sustainability, congestion, governance, and technology. As the transport industry becomes more complex, conventional approaches, focusing on a narrow range of factors, have to be replaced by more **nuanced analysis and solutions**. Further, issues related to the mobility of freight are assuming greater importance within the discipline in part driven by the setting of global supply chains and the growth of urban freight distribution. In the transport industry, in public planning, and in research institutions, the scope for transport geography remains diverse. Future transportation systems will likely be shaped by the same forces than in the past, but it remains to be seen which technologies will prevail and what will be their impacts on the spatial structure Downs, A. (1962).

Considering that a growing share of the global population lives in cities, urban transportation issues are of foremost importance to support the mobility of passengers in large urban agglomerations. Transportation in urban areas is highly complex because of the modes involved, the multitude of origins and destinations, and the amount and variety of traffic. Traditionally, the focus of urban transportation has been on passengers as cities were viewed as locations of utmost human interactions with intricate traffic patterns linked to commuting, commercial transactions and leisure/cultural activities. However, cities are also locations of production, consumption, and distribution; activities linked to movements of freight. Conceptually, the urban transport system is intricately linked with urban form and spatial structure. Batty, M. and Y. Xie (1994).

Urban transit can be considered as an important dimension of mobility, notably in high-density areas. Processes related to economic integration, the fragmentation of production systems due to outsourcing and offshoring are interdependent and have favored to setting of global commodity chains, from the extraction of raw materials, manufacturing, to final consumption. This requires an understanding of logistics and the growing level of integration between production, distribution, and consumption Bookbinder, J.H. (ed) (2012).

2.2.2. Modes of Transportation Facilities Used

Transport is the most fundamental and obviously necessary component of any logistic system. In virtually all cases products must be physically moved from one location to another if a transaction is to be completed and transportation is often the component accounting for the highest percentage of the total cost of logistics. From logistics management standpoint the overriding issue facing the firm is choosing the optimum mode of transportation to meet customer service demand. A few of these points to put into consideration include; should the firm use its own carriers/common carriers; what are the different rates available; what specific transportation services are offered; how reliable are various common carriers and what mode of transport are competitors using.

With the changing economic scenario, factors such as globalization of markets, international economic integration, and removal of barriers to business and trade and increased competition have enhanced the need of transportation. It is one of the most important infrastructure

requirements which is essential for the expansion of opportunities and plays an important role in making or breaking the competitive positioning (McIvor, 2000).

Transportation is one of the most visible element of logistics operation it provides two services product movement and storage. It is the movement of people, animals and goods from one location to another. Modes of transport include air, rail, road, water, cable, pipeline and space.

The field can be divided into infrastructure, vehicles and operations. Transport is important because it enables trade between persons, which is essential for the development of civilizations (Coyle et.al, 2011).

As per (Coyle et.al, 2011) transportation service is very frequently important for the selection of a particular mode operating between two points. The dimensions of transportation service would include reliability, accessibility, and security. These factors are looked at in terms of their cost impact as well as the actual transportation cost itself in selecting a particular model.

Transportation is a critical link in the overall supply chain, which has become an important concept for organizations in the 21st century. Transportation can be viewed as the glue that helps to hold the supply chain together.

Transportation is an important and pervasive element in our economy, and it affects almost every person directly and/or indirectly. The goods we consume, our economic livelihoods, our mobility, and our environment are in some way impacted by transportation. Transportation also bridges the supply and demand gap inherent in specialization by region or area and the related mass production. The interrelationship between transportation and large-scale production points out the dependency of our global economy upon effective and efficient transportation. Transportation contributes to the value of goods by providing time and place utility. That is, effective and efficient transportation moves products to points where there is a demand for the product and at a time when it is needed.

2.2.3. Transportation Costs and Rates

Transport systems face requirements to increase their capacity and to reduce the costs of mobility. All users (e.g. individuals, corporations, institutions, governments, etc.) must **negotiate** or **bid** for the mobility of passengers and freight because supplies, distribution systems, tariffs, salaries, locations, marketing techniques as well as fuel costs are constantly changing. There are also costs involved in gathering information, negotiating, and enforcing contracts and transactions, which are often referred to as the cost of doing business. Trade also involves transaction costs that all agents attempt to reduce since transaction costs account for a growing share of the resources consumed by the economy, Afraz, N., et al. (2006).

Frequently, corporations and individuals must make decisions about how to route passengers or freight through the transport system. For passengers, this choice has been considerably expanded in the context of rising incomes and the availability of modes. For freight, the production of light and high-value consumer goods, such as electronics, and less bulky production techniques has expanded the locational choice of production and distribution. It is not uncommon for transport costs to account for **10% of the total cost of a product**. This share also roughly applies to personal mobility where households spend about 10% of their income for transportation, including automobile ownership which has a complex cost structure. Thus, the choice of a transportation mode to route passengers and freight between origins and destinations becomes important and depends on several factors such as the nature of the goods, the available infrastructures, origins and destinations, technology, and particularly their respective distances. Jointly, they define **transportation costs** Afraz, N., et al. (2006).

Transport costs are the costs internally assumed by the providers of transport services. They come as fixed (infrastructure) and variable (operating) costs, depending on a variety of conditions related to geography, infrastructure, administrative barriers, energy, and on how passengers and freight are carried. Three major components, related to transactions, shipments and the friction of distance, impact on transport costs Bowersox, D.J., E. Smykay and B. LaLonde (1968).

2.2.4. Transportation Costs and Time Components

Transportation offers a spectrum of costs and level of services, which results in substantial differences across the world. The price of a transport service does not only include the direct out-of-the-pocket money costs to the user but also includes time costs and costs related to possible inefficiencies, discomfort, and risk (e.g. unexpected delays). However, economic actors often base their choice of transport mode or route on only part of the total transport price. For example, motorists are biased by short-run marginal costs. They might narrow down the price of a specific trip by car to fuel costs only, thereby excluding fixed costs such as depreciation, insurance, and vehicle tax

Many shippers or freight forwarders are primarily guided by direct money costs when considering the price factor in the modal choice. The narrow focus on direct money costs is to some extent attributable to the fact that time costs and costs related to possible inefficiencies are harder to calculate and often can only be fully assessed after the cargo has arrived. There are significant conditions affecting transport costs and thus transport rates Bowersox, D.J., E. Smykay and B. LaLonde (1968).

2.2.4.1. Distance and time

The impacts of geography mainly involve distance and accessibility. Distance is commonly the most basic condition affecting transport costs. The more it is difficult to trade space for a cost, the more the friction of distance is important. It can be expressed in terms of length, time, economic costs or the amount of energy used. It varies greatly according to the type of transportation mode involved and the efficiency of specific transport routes. Landlocked countries tend to have higher transport costs, often twice as much, as they do not have direct access to maritime transportation. The impact of geography on the cost structure can be expanded to include several rate zones, such as one for local, another for the nation and another for exports.

The transport time component is also an important consideration as it is associated with the service factor of transportation. They include the transport time, the order time, the timing, the

punctuality, and the frequency. For instance, a maritime shipping company may offer a container transport service between several North American and Pacific Asian ports. It may take 12 days to service two ports across the Pacific (transport time) and a port call is done every two days (frequency). In order to secure a slot on a ship, a freight forwarder must call at least five days in advance (order time). For a specific port terminal, a ship arrives at 8 AM and leaves at 5 PM (timing) with the average delay being six hours punctuality.

2.2.4.2. Type of product

Many products require packaging, special handling, which are bulky or perishable. Coal is obviously a commodity that is easier to transport than fruits or fresh flowers as it requires rudimentary storage facilities and can be transshipped using rudimentary equipment. Insurance costs are also to be considered and are commonly a function of the value to weight ratio and the risk associated with the movement. As such, different economic sectors incur different transport costs as they each have their own transport intensity. With containerization, the type of product plays little in the transport cost since rates are set per container, but products still need to be loaded or unloaded from the container.

For passengers, comfort and amenities must be provided, especially if long-distance travel is involved. These amenities have a cost but can also be a source of revenue such as for retail and restoration.

2.2.4.3. Economies of scale and energy

The larger the quantities transported, the lower the unit transport cost. Economies of scale or the possibilities to apply them are particularly suitable for bulk commodities such as energy (coal, oil), minerals and grains if they are transported in large quantities. A similar trend also applies to container shipping with larger containerships involving lower unit costs. For the transportation of passengers economies of scale are salient for public transit systems. They are however limited by the demand as the maximum sized transport unit that can be assigned on a route cannot exceed the available demand without impairing its profitability.

Transport activities are large consumers of energy, especially oil. About 60% of all global oil consumption is attributed to transport activities. Transport typically accounts for about 25% of all the energy consumption of an economy. The costs of several energy-intensive transport

modes, such as maritime and air transport, are particularly susceptible to fluctuations in energy prices since energy accounts to close to half their operating costs.

2.2.4.4. Empty backhauls

Many transport interactions involve empty backhauls since it is uncommon to have a perfect match between an inbound and a return trip. Commuting patterns involve imbalanced flows and empty return trips. For international trade, imbalances between imports and exports have an impact on transport costs. This is especially the case for container transportation since trade imbalances imply the repositioning of empty containers that must be taken into account in the total transport costs. Consequently, if a trade balance is strongly negative (more imports than exports), transport costs for imports tend to be higher than for exports. Significant transport rate imbalances have emerged along major trade routes. The same condition applies at the national and local levels where freight flows are often unidirectional, implying empty backhaul movements.

2.2.4.5. Infrastructures and modes

The efficiency and capacity of transport modes and terminals have a direct impact on transport costs. Poor infrastructures imply higher transport costs, delays, and negative economic consequences. More developed transport systems tend to have lower transport costs since they are more reliable, connected and can handle more movements. Different modes are characterized by different transport costs since each has its own capacity limitations and operational conditions. A core aspect concerns the suitability of modes according to the distance involved and the nature of what is being carried. When two or more modes are directly competing for the same market, the outcome often results in lower transport costs and the development of niches. Containerized transportation permitted a significant reduction in freight transport rates around the world by allowing relatively small transport units (containers) to be carried in basified loads.

2.2.4.6. Competition, regulation, and subsidies

Concerns the complex competitive and regulatory environment in which transportation takes place. Transport services taking place over highly competitive segments tend to be of lower cost than on segments with limited competition (oligopoly or monopoly). International competition has favored concentration in many segments of the transport industry, namely maritime and air

modes. Regulations, such as tariffs, cabotage laws, labor, security, and safety impose additional transport costs, particularly in developing economies.

If the infrastructure is expensive to develop and maintain, this cost should be reflected in fares to cover the amortization of the asset. Publicly available roads are a form of cross-subsidy since they offer their users free infrastructure. Still, freedom of access can be misleading as sales and fuel taxes are paid by users and these funds are used for road infrastructure construction and maintenance. If a government or a corporation uses other sectors of its activities to subsidize the full costs of transport infrastructure, then this cross-subsidy is having an impact on its costs. Taxes and tolls are commonly used to cross-subsidize public transit.

2.2.4.7. Surcharges, taxes and tolls

Surcharges refer to an array of fees, often set in an arbitrary fashion, to reflect temporary conditions that may impact on the costs assumed by the transporter. They also take place when fares are regulated, leaving the operator to find alternative sources of revenue. The most common are fuel surcharges, security fees, geopolitical risk premiums and additional baggage fees. The passenger transport industry, particularly airlines, has become dependent on a wide array of surcharges as a source of revenue for operators. Yield management is another form of surcharge where a transport service provider changes its rate according to fluctuations in the demand.

Transport activities are often taxed, such as vehicle sales taxes and registration fees. Fuel taxes are the most significant form of taxation levied by governments with revenues often used to cover maintenance and infrastructure investment costs. Tolls are also commonly levied on the usage of transportation assets, particularly at bottlenecks such as bridges and tunnels.

Therefore, transport services providers make a variety of decisions based on their cost structure, a function of all the above types of transport costs. To simplify transactions and clearly identify the respective responsibilities specific commercial transportation terms have been set. While the transport rate plays an important role in the modal choice, firms using freight transport services are not always motivated by notions of cost minimization. They often show “satisfying behavior” whereby the transport costs need to be below a certain threshold combined with specific requirements regarding reliability, frequency, and other service attributes. Such complexities

make it more difficult to clearly assess the role of transport rates in the behavior of transport users. The role of transport companies has therefore sensibly increased in the general context of global commercial geography and logistics supply chain management. Maritime shipping companies, air carriers, and logistics service providers have as a result become multinational corporations in the global market economy that has created a dynamic business innovations ensuring huge investments in transportation sector.

2.2.5. Types of Transportation Costs

Mobility is influenced by transport costs. Empirical evidence for passenger vehicle use underlines the relationship between annual vehicle mileage and fuel costs, implying the higher fuel costs are, the lower the mileage. At the international level, the doubling of transport costs can reduce trade flows by more than 80%. The more affordable mobility is, the more frequent the movements and the more likely they will take place over longer distances. Empirical evidence also underlines that transport costs tend to be higher in the early or final stages of a movement, also known as the first and the last mile. A wide variety of transport costs can be considered. The following are the outstanding transportation costs according to Bookbinder, J.H. (ed) (2012)

2.2.5.1. Terminal costs

Terminal Costs are costs that are related to the loading, transshipment and unloading. Two major terminal costs can be considered; loading and unloading at the origin and destination, which are unavoidable, and intermediate (transshipment) costs that can be avoided. For complex transport terminals, such as ports and airports, terminal costs can involve a wide array of components, including docking / gate fees, handling charges and pilotage / traffic control fees.

2.2.5.2. Linehaul costs.

Costs that are a function of the distance over which a unit of freight or passenger is carried. Weight is also a cost function when freight is involved. They include labor and fuel and commonly exclude transshipment costs.

2.2.5.3. Capital costs.

Costs applying to the physical assets of transportation mainly infrastructures, terminals and vehicles. They include the purchase or major enhancement of fixed assets, which can often be a one-time event that can be amortized over several decades. Since physical assets tend to depreciate over time, capital investments are required on a regular basis for maintenance.

2.2.4. The role of transportation in logistics chain Performance

Because of more frequent and successful world commerce, the development of logistics affects the progression of economy more and more. Brewer, P., & Speh, T. (2000), stated that, when the economy is growing, both production and consumption will grow, hence leading to an increase in the demand for transport, and vice versa. Well-managed logistics system improves efficiency and benefits of business while decreasing logistics costs increases profits of products. In order to reduce the cost of logistics, good management of transportation is the key issue due to that it occupies a big part in the logistics activities. The development of an exchange or market economy, one in which goods are transferred from points of production to points of sale and consumption, depends upon the ability to move goods, that is, on the availability of transportation service (Fair & Williams, 1981).

Transport is a set of activities related to the movement of people and material goods by appropriate means. It plays a very important role in logistics, because of the goods movement and the creation of ancillary services (Grabara et al., 2014). Transport system is the most important economic activity among the components of business logistics systems. It provides the physical link through the movement and storage of materials for production, and outbound logistic through the movement and storage of finished goods to the customer (Sabry, 2015).

Transportation is a key process in the logistics chain, which is involved at every stage, right from the manufacturing of the product, to its final delivery at the required location. By moving goods from locations where they are sourced to locations where they are demanded, transportation provides the essential service of linking a company to its suppliers and customers (Reddy and Jayam, 2016).

Transportation is an essential and a major sub-function of logistics that creates time and place utility in goods. In fact, the backbone of the entire supply chain is the transportation management that makes it possible to achieve the well-known seven Rs- the right product in the right quantity and the right condition, at the right place, at the right time, for the right customer at the right cost (Kumar and Shirisha, 2014). Transportation plays a connective role among the several steps that result in the conversion of resources into useful goods in the name of the ultimate consumer. It is the planning of all these functions and sub-functions into a system of goods movement in order to minimize cost maximize service to the customers that constitutes the concept of business logistics (Tseng et al., 2005). Transportation management deals with transportation mode, fleet size, route selection, and vehicle scheduling and freight consolidation. All four areas are economically interrelated and should be planned in an integrated manner to achieve maximum benefit (Reddy and Jayam, 2016). In shipping goods to its warehouses, dealers and customers, the company can choose among five transportation modes: road, rail, water, pipeline and air (Kotler et al., 2005).

Transportation is required by the whole logistics operation processes. It plays a significant role in connection between various processing stages. For example, the raw materials from the place of production are transported to the industries for manufacturing. It is operated in various patterns, e.g. convey or belt during the producing procedures. Even in the final stage of business process, transportation is still necessary for delivering products from factories to wholesaler/ retails. The cost of transportation occupies a huge part within logistics total costs. Transportation cost proves the importance of transportation in logistics activities. Transportation is essential because no modern firm can operate the movement of its raw materials or its finished products without transportation. This importance is emphasizing by the financial strain placed on many firms by such disasters as a national railroad strike or independent truckers' refusal to move goods because of rate disputes. In these circumstances, markets cannot be served, and products back up in the logistics pipeline to deteriorate or become obsolete.

According to Sloggett and Woods (1989), transportation plays a significant role in making location decisions for new business or industry. Generally, two transportation objectives are taken into consideration while making a business location decision: 1) low transportation cost

and 2) satisfactory transportation service. So for any logistics activity transportation play a vital role.

2.2.6. Effects of Transportation Facilities on Logistics Supply

Transportation plays a connective role among the several steps that result in the conversion of resources into useful goods in the name of the ultimate consumer. It is the planning of all these functions and sub-functions into a system of goods movement in order to minimize cost maximize service to the customers that constitutes the concept of business logistics. The system, once put in place, must be effectively managed. (Fair et al., 1981). Traditionally these steps involved separate companies for production, storage, transportation, wholesaling, and retail sale, however basically, production/manufacturing plants, warehousing services, merchandising establishments are all about doing transportation. Production or manufacturing plants required the assembly of materials, components, and supplies, with or without storage, processing and material handling within the plant and plant inventory.

Warehousing services between plants and marketing outlets involved separate transport. Merchandising establishments completed the chain with delivery to the consumers. The manufacturers limited themselves to the production of goods, leaving marketing and distribution to other firms. Warehousing and storage can be considered in terms of services for the production process and for product distribution. There have been major changes in the number and location of facilities with the closure of many single-user warehouses and an expansion of consolidation facilities and distribution centers. The ability to transport goods quickly, safely, economically and reliably (logistics) is seen as vital to success of businesses, and to a nation's prosperity and capacity to compete in globalized economy (Fekadu, 2013). These developments reflect factors such as better transport services and pressures to improve logistics performance.

The role that transportation plays in logistics system is more complex than carrying goods for the proprietors. Its complexity can take effect only through highly quality management. By means of well-handled transport system, goods could be sent to the right place at right time in order to

satisfy customers' demands. It brings efficacy, and also it builds a bridge between producers and consumers. Therefore, transportation is the base of efficiency and economy in business logistics and expands other functions of logistics system. In addition, a good transport system performing in logistics activities brings benefits not only to service quality but also to company competitiveness.

2.3 Logistics Practices and Supply chain Management

The Logistics management started in the 1950s due to how complex it was for companies to ship products to customers at the right time. The concept of logistics management which is part of a company's supply chain involves the movement of products and services to the customers. The Council of Supply Chain Management Professionals (CSCMP, 2011) defines logistics management as: "Logistics management is that part of the supply chain management that plans, implements and controls the efficient, effective forward and reverse flow and storage of goods, services and related information between point of origin and the point of consumption in order to meet customer requirements".

According to Li et al. (2006) the dual purpose of Supply chain practices is to improve the performance of an individual organization as well as that of the entire supply chain. Researches support this conception, portraying supply chain practices as a strategic level concept Mentzer, et al.(2001) consider supply chain practices as a systemic, strategic coordination of business functions within an organization and between organizations within the supply chain, for improving the long-term performance of individual companies and the supply chain as a whole. The emphasis of each of these definitions is on the objective of supply chain practices to create a distinctive advantage by maximizing the total value of products and services (Stank et al., 2005).

From the definition, the core idea of logistics management is to meet customers' needs through optimizing movement of products and services within the company. Some activities in logistics management include inbound and outbound management, sourcing and procurement, planning and customer service at strategic, tactical and operational levels (CSCMP, 2011). Logistics professionals use their knowledge of the different logistics areas to coordinate resources in an organization through monitoring the flow of products and services. Wilson (2009) writes that, with the growing understanding of logistics management as an area of competitive advantage,

logistics management still faces some problems because companies still consider logistic management functions as a separate part of their operations from other company activities.

Another key principle of logistics management is figuring out the competitive areas they need to focus on in their operations. Due to the continuous change in the logistics environment, it is important to take action promptly to fulfill customers' needs to help build and maintain customer value. Hence, only when logistics management strategies are based on the needs of the company, can they gain a competitive advantage (Gammelgaard & Larson, 2001).

Logistics plays key role in supporting organizations as they strive for more efficient management systems as in the business practices, the inefficient logistics system together with the inefficient internal management would disable the organization to respond to the needs of customers with the lowest price at the shortest feasible time frame including the quality level which does not meet customer expectation and would lead the organizations to the competitive disadvantage situation against their rivals (Nyaberi and Mwangangi, 2014).

It is the part of supply chain management that plans, implements, and controls the efficient, effective forward, and reverses flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet customer's requirements. The complexity of logistics can be modeled, analyzed, visualized, and optimized by dedicated simulation software. The minimization of the use of resources is a common motivation in all logistics fields. A professional working in the field of logistics management is called a logistician.

The *Oxford English Dictionary* defines logistics as "the branch of military science relating to procuring, maintaining and transporting material, personnel and facilities". However, the *New Oxford American Dictionary* defines logistics as "the detailed coordination of a complex operation involving many people, facilities, or supplies," and the Oxford Dictionary on-line defines it as "the detailed organization and implementation of a complex operation". As such, logistics is commonly seen as a branch of engineering that creates "people systems" rather than "machine systems."

2.4. Transportation and Components of Logistics Supply Chain

Logistics services, information systems and infrastructure/resources are the three components of this system and closely linked. The interaction of the three main components in the logistics system is interpreted as follows. Logistics services support the movement of materials and products from inputs through production to consumers, as well as associated waste disposal and reverse flows. They include activities undertaken in-house by the users of the services (e.g. storage or inventory control at a manufacturer's plant) and the operations of external service providers. Figure 1 provides an overview of the logistics Supply systems scenario.

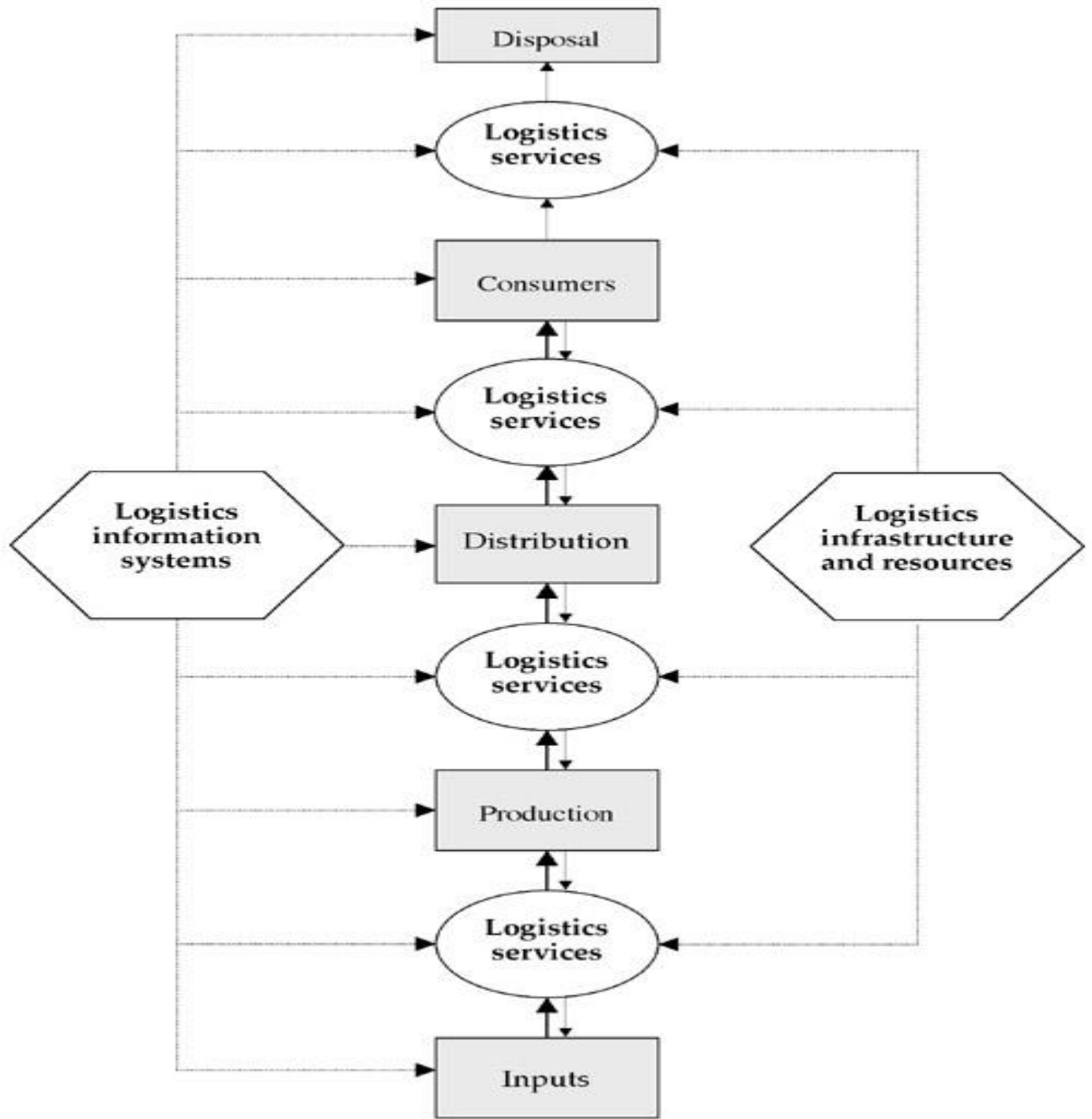


Figure-1 Logistics Supply Chain (source: BTRE, 2001)

As can be inferred from the figure the Logistics supply services comprise physical activities (e.g. transport, storage) as well as non-physical activities (e.g. supply chain design, selection of

contractors, freightage negotiations). Most activities of logistics services are bi-direction. Information systems include modelling and management of decision making, and more important issues are tracking and tracing. It provides essential data and consultation in each step of the interaction among logistics services and the target stations. Infrastructure comprises human resources, financial resources, packaging materials, warehouses, transport and communications. Most fixed capital is for, building those infrastructures. They are concrete foundations and basements within logistics systems.

2.5. Customers' Values on Transportation roles in Logistics Supply

The traditional conceptualizations are based on the creation of time and place utilities. (Mentzer et al., 1989) The often quoted —Seven Rsl definition of logistics describe the attributes of a company's product offering that leads to value creation through logistics service. In other words, part of the value that a company creates for its customer is its ability to deliver the right product in the right amount at the right place at the right time for the right customer in the right condition at the right price (Shapiro and Heskett, 1985).As cited by Swartz. In sum, logistics service the attributes of the process by which the item gets to the user is part of the value of the product (Mentzer et al., 1997) cited by Swartz.

Fundamentally, logistics creates customer value through three generic ways: efficiency, effectiveness, and differentiation or relevancy (Langley and Holcomb, 1992).

Efficiency refers to an organization's ability to provide the desired product/service mix at a level of cost that is acceptable to the customer. This concept implicitly identifies the need for managing organizational resources wisely so as to minimize the expenses incurred in providing a service and ensuring that the service delivered meets customer requirements. Therefore, the customer takeaway is economic value in terms of low price (Langley and Holcomb, 1992; Bowersox et al., 2000).

Effectiveness refers to an organization's ability to meet customer requirements in certain critical performance areas of logistics. For example, L.L. Bean has identified seven customer services called —Key result areas, namely product guarantee, in-stock availability, fulfillment time

(turnaround), convenience, retail service, innovation, and market standing (image). Therefore, the customer takeaway is market value which in the L.L. Bean's case is assortment and convenience. (Bowersox et al., 2000)

Differentiation or relevancy manifests itself in the ability of logistics to create value for the customer through the uniqueness and distinctiveness of logistical services (Langley and Holcomb, 1992; Bowersox et al., 2000). More recent concept of logistics supply value focus on the relationship of logistics service to customer service, capabilities, and competitive advantage of a firm. Logistics service is an important component of customer service and helps a company maintain its current competitive position in the marketplace (Langley and Holcomb, 1992).

2.6. Measurements of Transportation Facilities Performance

As stated by (Lata Chatterjee and Chiung, 2001), transportation is only one component of the integrated logistics supplies management, the current trend is toward increasing its contribution, and thereby, it's critical importance in boosting the logistic practices efficiency. Transportation, in the knowledge economy, is not limited to just movement of goods across the space. It no longer only performs a mere pre-production (moving inputs) and postproduction (delivering outputs) linkage functions. It is also a value-adding component that is incorporated into the strategic management and operational decisions of firms by the reducing operational costs through transportation logistics efficiency. Currently, the scope of transport logistics has grown such that it is influencing what to produce, where to produce, and in what quantities. Thus the function of transportation is undergoing a structural change, which is reflected in the evolution of transportation logistics.

Therefore, the use of efficient transportation facilities allows the firm to identify problem areas and then make changes, resulting in improved transportation services. Measures of logistics supply chain performance can be compared against predetermined standards, competitive benchmarks, or previous period performances to identify problems. These are reduced transportation cost, decreased loss of products and damages, and percent on-time deliveries.

Accordingly, there are four universal metrics of measuring transport and logistics performance. These include: Productivity metrics, Cycle time metrics, Quality Matrices and Financial mastics

2.6.1. Productivity metrics

Transportation asset productivity and transportation operator productivity are the common Transportation productivity metrics. The two main categories of transportation assets are containers and vehicles. Containers include over-the-road containers, ocean containers, air containers, and so on. The utilization of a container must incorporate the weight and cube utilization since container capacity is restricted in both dimensions. The metrics for transportation operator productivity do not differ that greatly from vehicle productivity because each vehicle is manned by an operator. The most common bases for assessing transportation operator productivity are the number of stops, miles traveled, dollars delivered, cases delivered, pounds delivered, pallets delivered and revenues generated per person-hour or in real time.

2.6.2. Cycle time metrics

Transportation can be viewed as the glue that helps to hold the supply chain together. Quicker transit, loading, and unloading times translate into greater asset utilization, which translates into greater leveraging of the corporation's capital. Some of the most popular cycle time indicators for transportation include: In-transit time (ITT), In-transit time variability, Vehicle load/unload time, Detention time, Delayed in traffic time.

Lata Chatterjee and Chung-Min Tsai, (2001) stated that transportation service is very frequently important for the selection of a particular mode operating between two points. The dimensions of service would include reliability, accessibility, and security. These factors are looked at in terms of their cost impact as well as the actual transportation cost itself in selecting a particular model. Thus, transportation is a critical link in the overall supply chain, which has become an important channel for boosting organizations, supply chain management performance in the 21st century.

2.6.3. Quality Matrices

The operational quality, secured products delivery and damage free logistics performance depends on the quality of transportation facilities used for the supply of goods and services to end users or production channels. Transportation quality and reliability are just as important, if not more important, than the cycle time of logistics supply performance. Transportation quality indicators to our clients includes Claims-free shipment percentage, Damage-free shipment percentage, Distance between accidents, On-time arrival percentage (OTAP), On-time departure percentage (OTDP), Perfect delivery percentage (PDP) and Perfect Route Percentage (PRP).

2.6.4. Financial mastics

Cost is the major variant factor for economic profitability of organizations and the cost is transport determines the efficiency of the supply chain performance. Transportation financial metrics should include total transportation costs and related ratios, as well as economic values for fleet assets. A detailed estimate of total transportation cost incorporates the following expense and capital elements: Freight, inbound and outbound, Fleet ownership costs, Driver/operator wages and benefits, Terminal ownership costs, Planner/manager wages and benefits, Office space ownership costs, Fleet leasing, Maintenance facility ownership costs, Terminal leasing, Transportation management systems software ownership costs, Office lease and utilities, Transportation computing infrastructure ownership costs, and telecommunications, Transportation infrastructure fees ownership costs (ports, bridges, and so on),Maintenance, Fuel, Third-party transportation fees, ,Customs brokerage and freight forwarding fees, Security, and Packaging materials. Hence, cost effective transport facilities is one of the factors which determine the logistics operations, and its supply chain performance.

2.7. Theoretical Literature Review

In this section of the literature review, two key theories namely the transaction cost economics (TCE) theory and resource-based view (RBV) theory are selected to gauge the theoretical framework the study and to support and explain the study outcome. According to Junior and Pires (2017), the fundamentals of transaction cost theory rely on companies exist to maximize their profits through reducing their transaction costs and the fundamentals of resource-based view theory rely on companies are constituted by resources sets that give them a competitive advantage.

2.7.1 Transaction Cost Economics (TCE) Theory

The transaction cost economics (TCE) essentially contributes to the question why firms are founded and how they are governed and structured hierarchically. A transaction is defined as the transfer of a pre-product or semi manufactured product or service from an upstream to a downstream manufacturing stage (Bremen et al., 2010).

TCE examines the efficient boundary between organizations and markets. The TCE represents that economizing transaction costs is the central to the study of organization, and economizing is accomplished by assigning transactions to governance structures in a discriminating. The TCE argues that transaction costs are the major concern when a company is choosing between producing internally and acquiring over the market (Hyuk, 2014). TCE describes the firm as an efficiency-inducing administrative instrument that facilitates exchange between economic actors (Leiblein, 2003).

According to Xu and Xia (2008), human was “limited rational”; at the same time, human was not only selfish, moreover, so long as it can benefit themselves, they would do not hesitate to harm others. Human's this natural instincts is called opportunism. The opportunists, when it is possibly to increase their profit, will dare to violate any warns, will send out distorted information to mislead other people intentionally, and will intend to make the information anisomerous. In this kind of situation, adopting measure to hold back opportunistic behavior is economic significant

to economics and will bring out new cost. According to Cao and Shang (2013), TCE suggests that a firm organize its cross organizational activities to minimize production costs within the firm and transaction costs within markets. The decision to use either vertical integration or market mechanisms depends on the relative monitoring costs that arise from bounded rationality and uncertainties due to partners' self-interest and opportunism. It helps firms reduce the opportunism and monitoring costs that are inbuilt in market transactions through process integration and mutual trust, thus reduce the probability that partners behave opportunistically.

Transaction cost theory has been applied to the question why firms exist. However, as companies tend to function more and more in networks, while logistic chains tend to lengthen and become more complex, a broader application of transaction cost theory may be required (Platje, 2013).

Logistics is the process of planning, implementing, and controlling procedures for the efficient and effective transportation and storage of goods including services, and related information from the point of origin to the point of consumption for the purpose of conforming to customer requirements (CSCMP, 2010). According to Platje (2013), Logistics heavily relies on transport, production, distributional and informational infrastructure (roads, railroads, reloading stations, warehouses, information systems and telecommunication systems) and it is an important instrument on supporting the efficiency of production and flow of goods from the raw material producer, via producers of intermediate and final products to the final consumer.

According to Platje, (2013), traditionally, three flows of logistics are identified – goods, information and money. The use of transaction cost economics regarding the flows of information is to reduce the costs of access to, processing, use, etc., of information. This flow embraces pre-contractual information search as well as monitoring of the fulfilment of agreements. The flow of money is related to transaction costs. money makes it possible to compare prices (reducing market transaction costs) and develop. On the other hand, post-contractual opportunistic behavior (cheating) accompanies money as a mean of payment for goods and services. When using different kinds of credits or when customers do not have to pay immediately, monitoring and enforcement costs related to late payment or lack of payment appear. Insurance and other instruments are in fact transaction costs of reducing the risk of non-fulfilment of the payment obligations. The development of logistics services in this field has the

aim to reduce the transaction costs in the form of safeguards against potential opportunistic behavior related with imperfect information as well as monetary flows.

The flow of goods concerns transport costs and production (from the production of raw materials to the production of final goods) costs. The flow of goods involves managerial transaction costs (related to production within a company) and market transaction costs when services and products are traded between companies. logistics is an instrument lowering the marginal transaction costs (the transaction costs of undertaking extra activity). logistics is also a mean to improve the flow of goods and reduce transport and production costs.

2.7.2 Resource Based View (RBV) Theory

The RBV theory suggests that a firm's resources and its capability to convert these resources to provide sustainable competitive advantage are the keys to superior performance (Liu et., 2010). In general, resources are referred to as physical, financial, individual and organizational capital attributes for a firm. Resources are necessary inputs for producing the final product or service and form the basis for a firm's profitability. Capabilities refers to a firm's capacity to deploy resources, usually in combination, using organizational processes, to effect a desired end. They are information-based, tangible or intangible processes that are firm-specific and are developed over time through complex interactions among the firm's resources.

According to the RBV theory, unique characteristics of firms lead to sustainable competitive advantage (Abadi and Cordon, 2012). Because many resources are firm-specific and not perfectly mobile or imitable, firms are continuously heterogeneous in terms of their resource base. Sustained firm resource heterogeneity, thus, becomes a possible source of competitive advantage (Das and Teng, 2000).

Firm-specific factors are more important than environmental or industry-structure characteristics in explaining firm superior performance. This premise also appears to be supported by logistics research which suggests that focusing on the enhancement of logistics capabilities is associated with superior firm performance (Olavarrieta and Ellinger, 1997).

Logistics distinctive capability can be instrumental in the creation of time, place, quantity, form and possession utilities within and among firms and individuals through strategic management, infrastructure management and resource management with the goal of creating products/services that satisfy the customer through the attainment of value.

Firms' increased preoccupation with quick response systems, efficient consumer response initiatives and just-in-time supply programs is further evidence that logistical distinctive capabilities are emerging as valuable factors in the development of customer-oriented corporate strategy to enhance performance. These programs tend to position logistics as the core capability or strategic resource – aimed at achieving customer satisfaction through inventory availability, timely delivery, less product failure and thus fewer lost sales or returns/complaints. As distinctions between products themselves diminish, service capabilities are rapidly becoming the premier means of differentiation available to firms. Effective logistics management can provide firms with a competitive edge, provided that the logistics system is designed around the needs of the customer (Olavarrieta and Ellinger, 1997).

2.8. Empirical Findings

In a more contemporary researcher, Michael Tracy, in his work entitled, transportation effectiveness and manufacturing firm performance stated that rapid and effective response in moving materials and information within short period are crucial, and transportation is a key element in making this happen. Transportation system that provides a reliable service level reduces supply chain uncertainty and the amount of inventory required throughout the chain which in turn reduces holding cost which finally reduces the overall cost of ownership of a product and the certainty of supply chain will build customer loyalty. The current study mainly focuses on the role of transformation in logistic chain performance (Michael Tracy, 2004).

Sreevinas and srivani, (2001) stated that logistics system has a more and more important position in the society activities and transportation and logistics systems have interdependent relationships that logistics management needs transportation to perform its activities. Meanwhile, a successful logistics system could help to improve traffic environment and proper transportation facilities development. Since transportation contributes the highest cost among the related elements in logistics systems, the improvement of transport efficiency could change the overall performance of a logistics system. It is also stated that transportation plays an important

role in logistics system and its activities appear in various sections of logistics processes. Without the linking of transportation, a powerful logistics strategy cannot bring its capacity into full play. The review of transport systems provides a clearer notion on transport applications in logistics activities.

Elizabeth Andreína (2016), Supply Chain and Transports Optimization, MA Thesis is critical work in the area of transportation in logistic chain management. This work is very recent in nature would provide valuable data for the present study. In a world that is increasingly demanding to have the supply of right product at the right time and place, transportation is one of the most fundamental activities within a supply as well as in the logistic chain grids. Given this importance, there is a continuous pursuit of optimization of opportunities in this area that can contribute to an increased efficiency of the supply chain as a whole. Hence, the thesis presents a problem existed in the company with further analysis of the company's inbound logistics supply chain, its activities and flows, plus relevant information regarding that area. Next, a literature review regarding supply chain and roles of transportation facilities topics is performed, with the aim of investigate current state of the transportation and identify relevant approaches. However, the present study is different from this because, it mainly focus on the role of transportation in logistic chain it does not include supply chain as a subject.

Yohannes Muluneh.(2017).The Impact of Logistics Performance on Organizational Performance: MA Thesis is another important literature in the study area. Effective and efficient logistics chain management has become a potentially valuable way of securing competitive advantage through enhancing and improving organizational performances. In this study the research intended to study the impact of logistics performance on organizational performance in Lion International Bank S.C. To address the problem the study employed descriptive research design and also quantitative approaches were used Data obtained through questionnaire has been analyzed by using frequency; percentile and the relationships proposed in the hypothesis were tested using Spearman rho correlation by SPSS 20.0 software version. The study find logistics inefficiency, late delivery and no well-developed tools to check customer satisfaction. The study by Yohans M, is very crucial work which in logistic chain performance in for organizational

development. However, the present study is mainly concerned with the role of transportation in logistics chain performance rather than focusing on impact of logistics on organization.

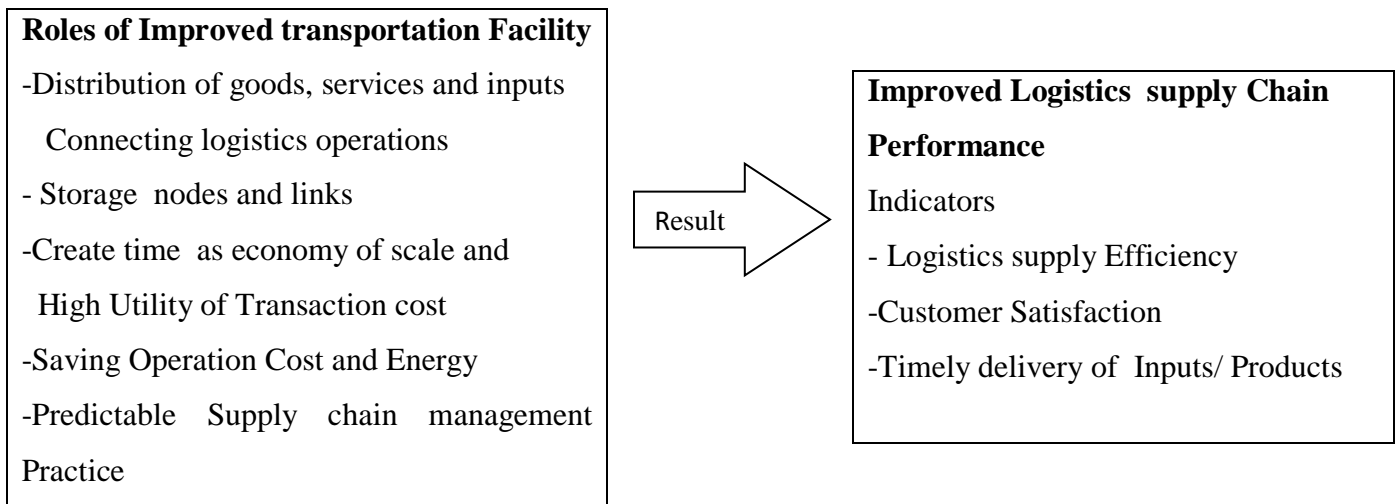
Yung-yu, T. et al.(2005) *The Role of Transportation in Logistics Chain*, Proceedings of the Eastern Asia Society for Transportation Studies, is a more related empirical work in the area of study. Transportation is not only a means of travel but is also a means of business growth. Transportation plays a very useful role in the development of the production sector in a country as well as the service provision so long as supply and demand are a concern. They concluded that Transportation takes a crucial part in the manipulation of logistics. The study on hand is similar to this study; because both of them concerned with *The Role of Transportation in Logistics Chain*. However, in the present study the researcher attempted to see from the perspective of the supply performance of the organization under study using different methodological approaches for his analysis of the data.

2.9 Conceptual framework

The conceptual frame work shows that transportation plays a significant role in the logistics chain management in the form of connecting links and nodes, storage and creating time and place utility to the products produced. The connecting role of transportation is that the flow of inputs to the company (the inbound logistics), materials movement within the company and the distribution of products to customer (the outbound logistics).

Transportation also used as a storage and linking facility for goods in transit whether for the inputs coming to the factory, while at rest for loading or unloading and for products in transit from the factory to the end users. On the other hand, transportation creates time and place utility by delivering the product where needed and when required. Unless products are available at the time and place needed, it is useless. Thus, properly regulating the means of providing products, facilitating supplies and availing production inputs of the company at the time and place required is the pivotal role of transportation. The Simulation Model in Transport and SCM Science is appropriate conceptual model used in the studies that focus transportation. Simulation has become an important approach for decision support in the field of SCM. In practice,

especially in the field of production, it has been applied for the validation of new layout choices, capacity planning and the evaluation of Performance Planning of logistics chain approaches such as shop floor planning,(dynamic) scheduling of the production orders, capacity plans and labour allocation(J.C. Bendul,2012). Lately, several other application fields, e.g., Supply Chain planning, product development and design and marketing, have risen to prominence. According to Goldsim (2011), four transportation decision support situations for simulation models in SCM can be distinguished: (1) optimization of problems, (2) decision analysis, (3) diagnostic evaluations and (4) risk management. The diagram below depicts the conceptual links of dependent and independent variables in line with the conceptual frameworks and the theoretical models used for this study.



Independent variable

dependent variable

Fig 2; The Conceptual Framework of the Study

The conceptual frame work shows that transportation plays a significant role in the logistics supply chain performance in the form of connecting, linking nodes, networking destinations and places, facilitating less warehouse storage and creating time and boosts revenues, reduce operational costs and high utility to the products produced. It enables easy access of products and

inputs to the clients by enhancing the management practices and supply chain performance efficient.

The performance oriented Integration of transport with logistics supply chain is a recent concept. For instance the lead time is comparably long to realize the different bundling and recombination processes. Usually a maximum lead time is offered. Thus, the delivery window for delivery and pickup is comparably long. The distance to the next terminal can be rather long, since usually there is a number of pickup sites and pre-haulage shipments are bundled. Thus, the packaged goods network is sensible for operation with multiple shippers as well as many loading and unloading sites. The flexibility of the concept is comparably high. The time, quantity and pickup and delivery places for shipments can be changed at short notice (J.C Bendul,2012).

Source: literature review

CHAPTER THREE

METHODOLOGY OF THE STUDY

This chapter describes the research design, sampling and instrumentation as well as the data analysis and ethical considerations of the study. According to Kothari (2004), Research methodology is a way to systematically solve the research problem. It may be understood as a science of studying how research is done scientifically maintaining the objectivity of the research findings and during the analysis of the collected data with careful and rigorous investigation.

3.1 Descriptions of the Study Area

Telecommunications service has begun in Ethiopia more than hundred years ago (Dubale, 2010). Telecommunications service was introduced in Ethiopia in 1894 during the rule of Emperor Minilik II. The first major telephone line construction spanned a total distance of about 477 kilometers and connected Harrar, a major trade center in the eastern region, with Addis Ababa, the capital city. The line, which took only two years to construct, also interconnected small towns situated along the route. Immediately after the telephone line, a telegraph line was installed following the construction of the first and only railway line in the country, the Ethio-Djibouti railway. Within two years, an 880-kilometer north-south telephone line connecting Asmara the capital of Eritrea, to Addis Ababa was constructed and made operational in 1904.

Ethio telecom is the oldest Public Telecommunications Operator in Africa (Bogale, 2005). After the end of the war against Italy, during which telecommunication network was destroyed, Ethiopia re-organized the Telephone, Telegraph and Postal services in 1941. In 1952, the Imperial Board of Telecommunications (IBTE) was established by proclamation No. 131/52. The Board had full financial and administrative autonomy and was in charge of the provision and expansion of telecommunications services in Ethiopia.

The Imperial Board of Telecommunications of Ethiopia, which became the Ethiopian Telecommunications Authority in 1981, was placed in charge of both the operation and regulation of telecommunication services in the wake of the market reforms. In 1996, the

Government established a separate regulatory body, the Ethiopian Telecommunication Agency (ETA) by Proclamation 49/1996, and during the same year, by regulation 10/1996, the Council of Ministers set up the Ethiopian Telecommunications Corporation (ETC). According to Federal Negarit Gazeta (2011), ethio telecom established as a public enterprise on 29th day of November 2010 as per the council of ministers Regulation no. 197/2010. Under the Federal Democratic Republic of Ethiopia, the telecommunications sector was restructured and two separate independent entities namely the Ethiopian Telecommunications Authority (ETA) and the Ethiopian Telecommunications Corporation (ETC) were established by Proclamation No. 49/1996 on November 1996 (Ethio telecom Magazine, 2014).

As a continuation of the 2005/06-2009/10 five year Plan and after concentrating its efforts on education, health and agriculture, the Ethiopian government has decided to focus on the improvement of Telecommunication Services, considering them as a key lever in the development of Ethiopia, Ethio telecom is born, on Monday 29th November 2010, from this ambition of supporting the steady growth of our country, within the Growth Transformation Plan (GTP), with ambitious objectives for 2015 (Ethio telecom Magazine, 2014).

Gradually, the former name of Ethiopian Telecommunication Corporation has changed to Ethio-Telecom in December 2011. During this time, the administration task is given to the France Company with the aim to facilitate the development of telecom infrastructures and to ensure knowledge transfer and international best practices and experiences in the industry and, thereby, improving the quality and competitiveness of the Ethiopian telecom company.

Accordingly, the company provides different telecommunication services including fixed line, mobile, internet and data services. As of November 2017, the total number of customers in mobile subscriber reached 62 million, fixed line 3 million and internet users, 3.2 million. Currently, Ethio-telecom has 9,000 employees. Ethio-telecom is the sole provider of the telecom service without competition but it has to see its operation had it been competition. Ethio telecom is a sole telecom services provider which operates to satisfy the telecom needs of the society than market competition by providing world class telecom services and to collect more profit making possible optimum efficiency of profit from the sector. This in turn requires the provision of essential customer service at lowest possible total cost.

3.2 Research Design

The study examined the role of transportation in logistics chain performance of the headquarters of Ethio-Telecom using explanatory research design. This is because explanatory research helps to see the relationship between variables. In order to do the research, both qualitative as well as quantitative type of data were collected, analyzed and used in order to get full information. The data were collected through questionnaire from different logistics activities including the transportation, operations and logistics department employees' activities. Thus, descriptive and explanatory research designs were employed to conduct the study.

The study used quantitative research approach to quantify the variables by way of generating numerical data or data that can be transformed into usable statistics relying on responses to pre-formulated questions.

3.3 Target Population and sample

The target population is the total number of subjects targeted by the study or the group of elements to which the researcher wants to make inference (Mundia et al., 2015). In this study, the population elements are the employees of Managers, drivers, experts, procurement, transport operation, facilities, and goods shipment working in the head quarter of Ethio telecom.

The population of this study encompasses employee of the aforementioned Company's logistics department including transportation, official managers and head of departments like logistics, fleet management and operation department staffs, etc. The population is 148 and as per the sampling method stated below, the sample size taken for this study were. Managers and head of departments, drivers, and head of transport services were taken as the research inputs through interviews.

3.4. Sample Size and Sampling Techniques

According to Kothari (2004), when the field of inquiry is large, considerations of time and cost almost invariably lead to a selection of respondents i.e., selection of only a few items. The respondents selected should be as representative of the total population as possible in order to produce a miniature cross-section. The selected respondents constitute what is technically called

a 'sample', the selection process is called 'sampling technique' and the number of items to be selected from the universe to constitute a sample is called 'sample size'.

The researcher used purposive and stratified random sampling method from probability sampling technique to select respondents from the target population. If a population from which a sample is to be drawn does not constitute a homogeneous group, stratified sampling technique is generally applied to obtain a representative sample.

The sampling method that was used to conduct focus group discussion and key informant interview was purposive sampling in order to get appropriate data from employees directly related with the transportation, logistics, and managers. This is because the data that can be gathered from those people who have specialized, knowledgeable and experience. This method is helpful to get first-hand information about the role that the transportation plays in the day to day operation of the logistics unit of the company. Thus the size of sample should neither be excessively large, nor too small. It should be optimum. An optimum sample is one which fulfills the requirements of efficiency, representativeness, reliability and flexibility (Kothari, 2004).

Stratified sampling method applied as each stratum is more homogeneous than the total population, stratified random sampling enable to get more precise estimates for each stratum and by estimating more accurately each of the component parts, it gives a better estimate of the whole. The target population (employees of Ethio telecom Head office) are in six different work sections such as(warehouse, procurement, fleet operation, facilities, inventory and goods shipment), It is more appropriate to use stratified random sampling to draw representative from all the six working units called strata. Then, the representatives were selected from each stratum using simple random sampling. The representative strata taken are Fleet operations,24; Facilities, 18; Inventory,16; Goods shipment,16; Procurement, 20; and Warehouse,12 employees were for administering questionnaire selected from the logistics and supply operations division. The data was finally validated using qualitative study conducted using the key informant interviews, group discussions and observational interpretation of the logistics supply chain operations of Ethio telecom.

As the social scientists argue, the size of sample should neither be excessively large, nor too small. It should be optimum. An optimum sample is one which fulfills the requirements of efficiency, representativeness, reliability and flexibility (Kothari, 2004). The sample size drawn from the total was 106 respondents out of 148 total population in the different working sections. The sample size was calculated using a formula called Slovin's formula (Israel, 1992) and thus the sample size account of the company's employees from six units of the logistics department.

Sample size determination formula thus used:

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

Where n is number of respondents

N stands for total population

e stands for error term of 5%

e = Error tolerance - at desired level of confidence, take 0.05 at 95% confidence level

Where n = number of samples

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

$$n = \frac{148}{1 + (148 * 0.05^2)} = 106$$

3.5 Data Source and Types

The types of data collection used for this study included both primary and secondary type of data. The instrument includes for the primary data, questionnaire and interview are the main one while for the secondary data, such as, Internet sources, web sources, theses, articles, journal with regard to the transportation and logistics activity of the Ethio-Telecom studied in a more detail. The primary data were collected from 106 employee, Drivers, logistics Managers and professional Experts of the Ethio-Telecom organization. Observational interpretation of the logistics operation and transporting from warehouses to the operational sites, inventories and unloading of goods was made in five sub branch district warehouses.

3.6 Data Collection Procedures and Instruments

The various data were collected with the help of questionnaire and close ended questionnaire was conducted from stratified randomly selected logistics department employees. The questionnaire data collected from 106 respondents which comprised of Fleet operations,24; Facilities, 18; Inventory,16; Goods shipment,16; Procurement, 20; and Warehouse,12 employees were for administering questionnaire selected from the logistics and supply operations division. The participants in the Key informant interview were purposively selected 5 individuals that took place in Ethio-Telecom headquarters with different departments like logistics, transportation, Drivers, fleet management chief executive heads in Addis Ababa head quarter. Observation interpretation study made on five operational branch warehouses supplies and storage branches. In addition, 2 focus group discussions conducted to triangulate and support the data found out through statistical analysis of questionnaires.

3.7. Ethical Consideration

Ethics are the norms or standards for conduct that distinguish between right and wrong. They help to determine the difference between acceptable and unacceptable behaviors. Ethics is particularly significant components throughout the research procedures and if failed to be taken into account, it can lead to misinterpretation or even invalid conclusions. In case of data collection, ethical considerations has been seriously taken into account to ensure the protection, integrity, anonymity, consents and other human elements of the informants.

The respondents were not identified by names and their consent was requested during the interview session and discussions. Hence, this paper did not go under any form of bias or change, and the researcher respected the code address issues such as honesty, objectivity, respect for intellectual property, social responsibility, confidentiality, non-discrimination and therefore maintained professional integrity.

3.8. Data Analysis

The data was perpetrated to analysis using application software packages named as Statistical Package for Social Sciences (SPSS) version 20. Data analysis was performed using descriptive and inferential statistics. According to Boone and Boone (2012), Likert scale data are analyzed at the interval measurement scale. Likert scale items are created by calculating a composite score (sum or mean) from four or more type Likert-type items; therefore, the composite score for Likert scales should be analyzed at the interval measurement scale.

Descriptive statistics recommended for interval scale items include the mean for central tendency and standard deviations for variability. Additional data analysis procedures appropriate for interval scale items would include the Pearson's r, ANOVA, and regression procedures. Thus this paper employed regression analysis method since it is used to capture a cause and result relationship model which is used to show that well-organized transportation system positively contributes to the effective logistics supplies management performance. Those factors that affect transport system is organized, interpreted and calculated their regression on transport performance and logistics as well.

3.8.1 Descriptive Statistical Analysis

Descriptive statistics was used to describe different characteristics. Frequencies and percentages were used to analyze general information about respondents, mean and standard deviation were used to describe aspects of transportation equipment, the practices and logistics supplies management challenges faced Ethio telecom. The mean is preferred as it considers the precise score of each case thus it incorporates more information than the median which only states a scores relative position. The standard deviation on the other hand, was used to measure variation. The results were presented using tables accompanied with explanations.

3.8.2 Inferential Statistical Analysis

In Inferential statistical analysis, correlation and multiple linear regression analysis were used to determine the relationship between the independent variable (role of Transportation Facility) and dependent variable (Logistics Supply chain Performance); and to test the effect of transportation on the proper logistics supplies performance management, respectively. The results were presented using tables. Every table were accompanied by result interpretation. Correlation and multiple linear regression are explained below.

3.8.2.1 Correlation Analysis

Correlation may be defined as the degree of relationship existing between two or more variables (Koutsoyiannis, 1977). The correlation coefficient (r) is a measure of the degree of covariability of the variables. The values that the correlation coefficient may assume vary from -1 to $+1$. When r is positive, there exists a positive correlation between the variables. $r = +1$ implies that there is a perfect positive correlation between variables. When r is negative, there exists a negative correlation between the variables. $r = -1$ implies that there is a perfect negative correlation between variables. when r is zero, then the variables are uncorrelated. The closer the value of r is to one, the greater is the degree of covariability. On the other hand, the closer the value of r is to zero, the lesser is the degree of the covariability.

The quantity r , called the linear correlation coefficient, measures the strength and the direction of a linear relationship between two variables. The linear correlation coefficient is sometimes referred to as the Pearson product moment correlation coefficient in honor of its developer Karl Pearson (Samuel and Okey, 2015).

As statistical estimate, r is inevitably subject to some error and should be tested for its reliability by conducting some test of significance (Koutsoyiannis, 1977). While computing a correlation, the level of significance shall be set at 95% with alpha value of 0.05).

3.8.2.2 Multiple Regression Analysis

According to Gujarati (2004), the term regression was introduced by Francis Galton. Regression analysis is concerned with the study of the dependence of one variable, the dependent variable, on one or more other variables, the explanatory variables, with a view to estimating and/or predicting the (population) mean or average value of the former in terms of the known or fixed (in repeated sampling) values of the latter.

The multiple regression analysis was used to determine whether transportation facility and practices influenced the Logistics supply chain management performance of Ethio telecom. The study takes the transportation facility roles factors as independent variables and the Logistics supply chain management performance as dependent variable in the regression model. The study used the following multiple regression model to establish the statistical significance of the independent variables on the dependent variable.

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \beta_7X_7 + e$$

Where; Y = Role of Transportation Facility

X1 = Organizational performance

X2 = Logistics Supply Efficiency

X3 = Logistics Supply Effectiveness

X4 = Logistics Differentiation

X5 = Customer Satisfaction

X6 = Profitability and Competitiveness of Business

X7 = Real Time Delivery of Inputs/ Products

In the model, β_0 = Constant, β_1 to β_6 = Regression coefficients represent the mean change in the dependent variable for one unit of change in the independent variable while holding other independent variables in the model constant and e = Error term which captures the unexplained variation in the model.

3.9 Validity and Reliability

3.9.1 Validity

Validity is the extent to which a test measures what it claims to measure (Lakshmi and Mohideen, 2013). A measure is valid if it measures what it is supposed to measure. According to Kindy et al. (2016), content validity is the extent to which the items in an instrument covers the entire range of the significant aspects of the area being investigated. It is the degree to which the measurement device, in this case, the measuring questions in the questionnaire, provides sufficient coverage of the research investigative questions. To maintain the validity of the instruments, most of the questionnaires were adopted from previous researches. Some of the questionnaires were developed based on careful review of literatures. In addition, pilot testing of questionnaires was conducted to obtain a feedback from the respondents on the validity and responses were collected and questionnaire was adjusted subsequently. The data collected through questionnaire were supported by the triangulation of different data collected through focus group discussions and key informant interviews.

3.9.2 Reliability

Reliability is the extent to which measurements are repeatable when different persons perform the measurements on different occasions under different conditions with supposedly alternative instruments which measure the same thing (Drost, 2011). Reliability is consistency of measurement or stability of measurement over a variety of conditions in which basically the same results should be obtained.

The most popular method of testing for internal consistency in the behavioral sciences is Cronbach's coefficient alpha. Cronbach's alpha reliability coefficient normally ranges between 0 and 1. Gliem and Gliem (2003), provide the following rules of thumb: if " $\alpha > 0.9$ – Excellent, $\alpha > 0.8$ – Good, $\alpha > 0.7$ – Acceptable, $\alpha > 0.6$ – Questionable, $\alpha > 0.5$ – Poor, and $\alpha < 0.5$ – Unacceptable". The table below show the reliability test of the study which is calculated by the coefficient Cronbach's alpha.

Table-3.1 Reliability Test

Transportation facility boost the efficiency of logistics Supply chain	.916
transportation is efficient in moving materials, inputs and products timely	.892
Transportation facility operates in lowest possible damage of products	.720
The transportation enable our company's economies of scale effective	.789
Our transportation service gives quick response to special requests from clients	.858
Our transportation services facilities ensure customers satisfaction	.877
Our transportation facilities are cost efficient	.839
Our transportation facilities are equipped with appropriate channels	.763
The overall quality of our transportation facilities is very high	.825
The general organizational performance of our Supply chain is dependable to clients and end users	859

Lack of adequate and modern equipment	.829
Excessive loading and unloading time	.784
Substandard Trucks	.882
Missed Schedule	.739
Warehouses operation quality is supply sensitive and fast	.837
Higher rate of loss and damage	.820
Employee Negligence	.783
Infrastructures and facilities related Problems are high	.859

Source, Study Survey, 2020

Table -3.1: The Reliability Test

Cronbach alpha was computed and compared with the threshold value of 0.7. An overall value of 0.891 was obtained which implied that high level of internal consistency of research instruments used to undertake this study and the reliability of the study is done in line with scientific rigor.

CHAPTER FOUR

Data Analysis, Interpretation of Findings and Discussion

4.1 Introduction

This study conducted an assessment of the role of transportation facility boosting supply chain performance, taking case of Ethio telecom. This section makes a detailed presentation and interpretation of the results of the data collected via questionnaire dissemination, Key informants, and observations and focused discussions. This chapter presents thus, the data analysis, research findings and discussions with respect to research objectives and research questions as stated in the first section of the study.

Response Rate

Response rate is formally defined as the number of completed questionnaires divided by the number of eligible sample members (Frohlich, 2001). Response rates are generally considered to be the most widely compared statistic for judging the quality of surveys (Johnson and Owens, 2008). There is no specific response rate that guarantees an unbiased representation of the population. As a general rule of thumb, most reviewers look for a response rate $\geq 70\%$ (Rubinfeld, 2004). From a total of 106 questionnaires were distributed to warehouse, procurement, fleet operation, facilities, and inventory and goods shipment employees of ethio telecom. Out of the 106 questionnaires, 106 were returned to the researcher. However, only two questionnaire were partialy incomplete and the researscher used the questionnaire. which represents a response rate of 97.7%. This percentage was considered sufficient for the study as it is higher than the general response rate rule of thumb. From the returned questionnaires, only 2 were incomplete as presented in table 4.1.

Table 4.1 Response rate

Response status	Frequency	Percentage
Total Distributed	106	100
Filled and returned	104	99.3
Incomplete but returned	2	0.7

Source: Study Survey, 2020

Table -4.1: Response Rate of the questionnaire

The respondents were selected to ensure that they are from supply chain division to provide more detailed information. Respondents are familiar with the day-to-day operational activities of the company with regard to supply chain practice. To support the data with qualitative in-depth data, five senior officers from the top management and logistics supplies department were interviewed to bring in more perspective.

4.2 Demographic Information of Respondents

This section presents general information about respondents. The general information collected was on gender, level of education, work unit and work experience. The results of the general background information of 106 respondents as obtained from Section 1 of the Questionnaire annexed on (Appendix 1), are presented in the table below.

4.3 Gender of Respondents

The study sought and obtained gender details of the respondents as shown in table 4.2.

Gender	Frequency	Percent	
Male	67	63.2	
Female	39	36.8	
Total	106	100.00	

Source: Study Survey, 2020

Table 4.2 Gender of respondents

The data shows that among the employees participated, 63.2 males and 36.8 are females in sex composition. As can be seen from the data the organization’s employee gender profile is male dominated but fairly good in engaging women in their logistics and operations departments.

4.4 Work department units of the respondents

The study sought to find out the employees in different work division of respondents and the responses were analyzed as shown in table 4.3.

Work Unit	Frequency	Percent
Fleet operation	24	22.6
Facilities	18	16.9
Inventory	16	15.0
Goods shipment	16	15.0
Procurement	20	18.8
Warehouse	12	11.7
Total	106	100

Source: Study Survey, 2020

Table 4.3 Work department units of the respondents

The study found out that 18.8% of the respondents were from procurement work unit followed by warehouse management work unit (11.7%) and goods shipment work unit (15.0%). 16.9%, 22.6% and 15.0% respondents were from facilities, fleet operation and inventory working units respectively. This implies that the respondents were able to understand the different logistics practices sought by the research based on the different work units they belong.

4.5 Educational Qualification of Respondents

The study sought to find out the education level of respondents and the responses were analyzed as shown in table 4.4.

Education Level	Frequency	Percent
Diploma	8	7.5
First degree	85	80.1
Second degree and above	13	12.4
Total	106	100.0

Source: Study Survey, 2020

Table-4.4: Educational Qualification of respondents

The study conducted show that majority (80.1%) of the respondents had first degree level of education followed by 12.4% of the respondents who had second degree and above level of education and then 7.5% who had diploma level of education. This indicates that the respondents had sufficient levels of education to engage in response properly to the subject of by the study.

4.6 Work Experience of Respondents

The research wanted to find out the years the respondents has been with the logistics management functions in the case company. The responses were analyzed, and the results are shown in table 4.5

Work Experience	Frequency	Percent
Below 1 year	5	4.8
1-3 years	10	9.5
4-6 years	36	33.9
Above 6 years	55	51.8
Total	106	100.0

Source: Study Survey, 2020

Table 4.5: Work experience of respondents

The study findings revealed that majority of the respondents (63.4%), had a work experience of above 6 years whereas 28.0% had a work experience of between 4 to 6 years. only 8.5% had below 3 years of work experience as indicated in table 4.5. This shows that majority of the respondents had served for a considerable period of time which implies that they were in a position to give credible information relating to the study.

4.7 Roles Analysis on Transportation Facilities Performance

To analyze the factors that affect transportation were analyzed using the correlation of the variables from the data collected from the respondents. To this end, the descriptive statistics applied to extrapolate the relationship between the study factors. Table 4.7 below shows the statistical data of the factors analysis.

Response Items	N	Mean	Stand. Dev
Our transportation service gives quick response to special requests of orders	106	4.39	.858
The transportations channels and vehicles used to logistics supply are substandard tracks	106	4.57	.882
Transportation service of our company is cost efficient	106	4.19	.839
Transportation provides logistics efficiency	106	4.63	.853
The company reaches economies of scale	106	4.55	.745
The overall quality of our transportation facilities is very high	106	4.26	.729
The general organizational performance of our Supply chain is dependable to clients and end users	106	3.85	.836
Transportation is efficient in moving materials, inputs and products timely delivery	106	4.74	.896

Source: Study Survey, 2020

Table 4.6. Role of transportation Facility in logistics Supply Performance

As per the data from the respondents, the information was gathered from the logistics department who respond to the statements on a 5 point Likert scale. They indicated the extent they agree with the statements that is: 5-Strongly agree, 4-Agree, 3-Neutral, 2-Disagree, 1-Strongly disagree. A mean (M) score of 0-1.5 means that the respondents strongly disagreed, between 1.51 to 2.50 means they disagreed, 2.51 to 3.50 means the respondents were neutral, 3.51-4.50 means they agreed, and a mean above 4.51 means the respondents strongly agreed. As per the response from respondents, as per the result above, the result shows that practices of the company like transportation provides logistics supply chain efficiency and thereby boost the performance of the logistics services of the Ethio telecom.

The result shows that logistics supply performance of the company like transportation provides logistics efficiency, transportation systems timely delivery and satisfy customer, the company reaches economies of scale and cost efficient operation. The study shown that transportation cost is competitive in comparison with the market have a mean square value of 4.63, 4.74, 4.55 and 4.19 respectively showing that transportation is providing logistics efficiency by playing the roles of connecting, storage and creating time and place utility. Transportation increases customer satisfaction by timely delivery of product to the customer which is supported by 4.74 mean square value meaning respondents agree on the role of transportation in the company for timely delivery and safe handling of products. The study show that the company's transportation service gives quick response to special requests which is supported by 4.39 as can be referred from the above table.

Furthermore, the other thing that respondents agree on is transportation cost of the company as they stated it is efficient and adds value to the logistics supply as can be assured from its Mean result is 4.19 , and the stand. Deviation is .839 from the total scale range. The company's logistics performance in implementing economies of scale known for that it is moving bulky products at a time and moving products long distance by consolidation which is supported by respondents with a (mean value of 4.55, with stand. deviation result of .745).

Regarding transportation services cost efficiency, the overall quality of transportation for organizational logistics performance and transportation services quick response to special

requests in the company is with mean value of 3.85, 4.19, 4.39, and 2.24 respectively. This shows the lowest standard of transportation quality in supply performance. Consequently, Transport system is the most important economic activity among the components of business logistics systems. Around one third to two thirds of the expenses of enterprises' logistics costs are spent on transportation. According to the investigation of National Council of Physical Distribution Management (NCPDM) in 1982 (Chang, 1988), the cost of transportation, on average, accounted for 6.5% of market revenue and 44% of logistics costs. This analysis also shows that the transportation scored the highest cost, which occupies 29.4% of logistics supply costs for managing inventory, warehousing cost, packing cost, management cost, movement cost and ordering cost. The ratio is almost one-third of the total logistics costs. The transportation cost here includes the means of transportation, corridors, containers, pallets, terminals, labours, and time which occupy an important ratio of costs in logistics supply activities.

The respondents shown that these aspects of the logistics supply chain management were deterred by less operating transport which detracted the efficiency of logistics supply to some degree. The study concerning these aspects investigated the qualitative aspects and found out that the transportation service is consuming much cost due to high fuel cost coupled with the existence of low quality transportation equipment's in the company with mean 4.57 and stand. dev .882. In addition, the response status of the company is giving is not as quick as expected concerning quick responses to special requests of customers with mean 4.39 and standard .dev of.858.

The above findings show that, even though Ethio telecom's logistics supply in regard to transportation facility function at present demand, it has to identify areas of transportation practice like transportation bulk carrying capacity, transportation cost and the time it takes to reply to special inquiry and work on those dimensions in order to improve the transportation which in turn improves the overall logistics supply chain efficiency resulting in improved organizational performance. The role that transportation plays in logistics system is more complex than carrying goods for the proprietors. Its complexity can take effect only through highly quality management. By means of well-handled transport system, goods could be sent to the right place at right time in order to satisfy customers' demands. It brings efficacy, and also it

builds a bridge between producers and consumers. Therefore, transportation is the base of efficiency and economy in business logistics and expands other functions of logistics system. Hence, the study revealed a good transport system performing in logistics activities brings benefits not only to service quality but also to company competitiveness.

Therefore, it could be said that without that without well-developed transportation systems, logistics supply routes could not bring its added values and advantages into the company to full play the expected role in boosting supply chain management performance. Besides, a good transport system in logistics activities could provide better logistics efficiency, reduce operation cost, and promote service quality. The improvement of transportation systems needs the effort from both public and private sectors who are engaged in the supply chain of the Ethitelecom logistics supply systems. Thus, the study revealed that a well-operated logistics supply system could increase both the logistics supply performance and the business profitability of the company.

4.8 Logistics Supply Chain Performance of Ethio telecom

The study found out that transportation the critical factor in improving the performance of the logistics supply chain performance. Three measure metrics were used to assess supply chain performance of Ethio telecom: quality (supplying products with the right quality to the customers' request), time(providing in/on time delivery and providing customer orders with the shortest possible time) and cost(provision of customers' orders with the lowest possible cost/price). Among 106 responses, 82% of respondents indicated that they have effective Transportation and logistics supply policy. Based on the reply, it is observed that the most common answer was that the company did have effective customer service policy.

Concerning the logistics department the respondents mentioned that they have a logistics department in the organizational division and measures its logistics performance using quality, time, cost and delivery. Other respondents revealed that the company has a logistics department, and the Logistics Information System/LIS is operating towards the best business standard. The study found out that that the supply chain of the company practicing logistics activities using substandard supply equipments strengthening marketing, supplies and procurement departments.

The study data indicates that the mean value for supplying products with the right quality to customers request is 4.1 which shows that the quality of products that are supplied to customers' order are to a moderate level. Regarding in/on time delivery & providing customer orders with the shortest possible time the mean values are 4.74 & 4.39 respectively. This implies that the real time for operation of logistics supply need improvement to attain the standard logistics supply chain of the company, which is 4.7 from a scale of 5. When it comes to providing customer orders with the lowest possible cost/price the resulting mean value is 4.19 which is still showing low level of practice in managing the logistics supply cost. Thus, depending on the above variable results we can say that Ethio telecom's supply chain performance need to concentrate around implementation of these important measures– quality, time and cost to boost its logistics supply performance efficiency.

4.9 Customer Satisfaction Index of Ethio telecom Logistics SCM

Customer service practices	Mean	Std. Deviation
Responding quickly to the customers' needs in time	2.693	.87929
Fulfilling customer orders in the promised delivery time	3.1142	.72376
Using up to date information for forecasting of customer needs	2.8159	1.49531
Proper organizing of Invoicing and collection methods	2.7552	1.52684
Applying electronic communication like EDI or ERP with customers for joint planning	3.2889	.89595
Sharing technical information with customers when required	2.3376	.99087
Creating long term relationships with customers	2.9556	1.61349
Measuring and evaluating customer satisfaction level periodically	3.9846	1.78315

Table-4.7: Customers' Satisfaction Index of the Ethio telecom Logistics SCM.

As can be interpreted from the above table 4.7, this study shows that less attention has been paid to both the identification of the fundamental components of integration of transportation with the customer expectations and logistics supply system. In addition, the misunderstanding of the role of integration on the performance of a transport facilities and supply chain jointly boost the satisfaction of the customers as indicated in the mean value of the sum of the customer services practices are measure only 3.0318 as per the Likert scale index. The standard deviation is also between .72376 and 1.78315 values which indicates that the operational quality and customer satisfaction has a reasonable level of deviation from the standard of the company. Therefore, as 0.7 implies in Corvachoov's Alpha, the lowest possible acceptable standard of transportation

operation quality in line with customer satisfaction, the Ethio telecom need to revitalize its transportation facilities uses in an integrated approach so that it can enhance customer satisfaction at a reasonable degree.

4.10 Supply Chain Management Performance of Ethio telecom

Transportation plays a connective role among the several steps that result in the conversion of resources into useful goods in the name of the ultimate consumer. The types of transportation facilities used for operation of supply affect significantly its performance and timely delivery of goods to the customers. The common types of transportation facilities used for the supply of goods and services are medium trucks, light vehicles, ship and railways. The respondents in focus group discussion revealed that the company has 18 trucks, 47 vehicles and 26 distribution cars. The study also revealed that 138 personnel involved in the supply channels of the company who are engaging on transportation, loading and unloading of products as well as inputs of the telecom services. The company has 11 warehouses and 21 distribution shops in Addis Ababa and transportation facilities are used to track products from warehouses to distribution shops as well as storage destinations.

The Pearson's Correlation coefficient shown that problems related with transportation facilities like trucks and vehicles affected the supply chain performance of Ethio telecom. The researcher has attempted to establish the correlation between the variables that characterize the factors affecting supply chain performance in order to demonstrate how strong the relationship between the variables is. The Pearson's Correlation was used to explore a correlation between supply chain performance and the independent variables (transportation facilities used). The data in the table below analyzed below presented the performance level.

Variables	Supply Chain Performance level	Supplies Operation in real time	Timely Delivery to customers	Cost Efficiency of the logistics
Supply Chain Performance	.925	.821	.793	.726

Source: Study Survey, 2020

Table -4.8: Pearson Correlation Analysis of Supply Chain Performance of Ethio telecom

According to the above data, the general performance of the supply chain is .925. The real time used for operation of supplies at one route or at loading and unloading point from warehouses scored .821 in Parson's correlation. Similarly, concerning the timely delivery of the supply to the customers or shops perform in the range of .793 correlations. Consequently, the costs efficiency is .726, which indicates that the company is performing in line with reasonable level of economies of scale at cost is directly related to the revenues generated by the company. Apparently, as the test statistic value is positive and is greater than the critical value shows there is significant linear correlation Therefore, this implies that the supply chain management is functioning at good standard and well addressing the needs of customers efficiently.

4.11 Qualitative Analysis of Interview and Focus Group Discussion Results

In addition to questionnaire, qualitative methods such as key informant interview, observational interpretation and group discussion were conducted. An in-depth interview with five personnel at office level in ethio telecom was made to comprehensively understand the problems of Transportation facilities practices and Supply Chain Management Performance so as to fill the gaps of information from the questionnaire. This interview was made after fully completing the analysis from the survey questionnaire, and the interview questions were designed accordingly in order to support and confirm the information acquired from survey questionnaire result. For this purpose, five employees who are in the top management positions related to the survey analysis were selected and interviewed individually. These officials were Officers from the following divisions: (1) Supply Chain Division (2) Network Division (3) Enterprise Division (4) Fleet Management Division and (5) Warehouse Operations and Supplies Department.

The key findings on roles of transportation and supply chain performance identified were:

4.11.1 Maintenance Needs of Transportation Facility

The operational quality of transportation facilities affects the real time delivery of products. The senior official in the discussion mentioned that due to poor road quality of our nation, the vehicles often face the damage after the supplies transportation two to three returns. This situation often keeps 10 to 15 vehicles to stay in maintenance at garages. In addition, the company did not have own maintenance garage facility lengthy of time in maintenance is a recurrent factor that hinder logistics supply chain performance.

4.11.2 Slow-movement of inventory

Usually, those products with small volume, low weight and high values, the transportation cost simply occupies a very small part of sale and is less regarded; but for those big, heavy and low-valued products, transportation occupies a very big part of the sale's share and affects the gross profits more, and therefore it need to be more regarded in the logistics supply system.

The right transportation facilities have thus significant impact on the company's logistics performance. Thus, excessive slow-moving inventory due to cancellation of orders were a significant supply chain problem. Accordingly, all respondents believed that performance of ethio telecom's supply chain in meeting customer satisfaction is getting improved compared to previous times. However, this does not mean that Ethio telecom is efficient and performing well as per the standard. These slow moving products are bought in bulk and since the company's service is technology oriented, most of these stocks in some occasions become outdated before reaching the distribution shops of end users.

4.11.3 Lengthy process of order issuance and Bureaucracy

Procurement /Sourcing manual of ethio telecom dictates that all procurement is made using open tender except and otherwise, the issue should be treated case by case and supported by strong justification to prove that other methods of procurement are followed. While looking the lead

time that requires in each method of procurement for single order cycle it is expressed as standard as large as (203- 366) days lead time expected in open tender and as small as (104-184) days in case of direct procurement. As Ethio telecom carries out procurement through open tender, this has had a negative impact in going hand in hand with dynamic technological changes which in turn leads to postponement of service delivery. Order processing phase is a time consuming factor that affects the efficiency of total supply chain process. So this prolonged the supplies performce

4.11.4 Inactive Enterprise Resource Planning (ERP)

Planning is the key element on the operational management and facilitated transport facilities. Therefore, cost effective procurement of supplies depends on the specialized skills to ensure that buying requirements are reliably determined. The need for appropriate contract strategies are developed, and the provisions of contracts are well managed for securing the opportunities to the best deal at the right time and at the right price. However, Ethio telecom is still facing challenges of improper planning and linking demand to budget.

This attribute to limited skills and the availability of huge financial capacity influenced the proper supply chain management performance. Ethio telecom has purchased three ERP modules from Oracle and implemented it before four years but not yet benefiting from the system as it is expected. However, the difficulties are still there which hinders the company from enjoying it benefit to the fullest.

4.11.5 Delivery time promised to customer hardly achieved

Due to variations in supply and implementation problems – promised delivery date and quantity to customers were rarely achieved. The officials on the discussion raised that real time supply of products per one hour is about 2.3 tones and the real delivery time to the clients at average distances from the wares is about 3 hours. The officials also stated that the long maintainace time required for maintenance of transportation facilities caused delays in the supply chain operations properly.

4.11.6 Problems of inventory management

Quality management of stocks is one of the key factors that affect the business organizations. Stocks in the warehouses and distribution shops are not regularly checked and replenishment policy is not as such at its strong practice. So some critical goods become out of stock leading to urgent deliveries to sustain the service provision which in turn leads to increased cost to speed up the delivery and delay to respond to external customer request.

4.11.7 High cost of Utility

The international market price has direct effect on the supplies operation and on the general business performance of the Ethio-Telecom. The officials on the discussion raised that real time supply of products per one hour is about 2.3 tones. The monthly fuel and utility quantity is about 7000 liters. Thus, the efficiency of transportation is limited to about 85% and organization's supplies performance is operating at about the rate 75% mainly because of high fuel and increase of utility costs.

4.11.8 Inconsistency of Suppliers/Clients

The inconsistent customer relationship of local supplier base was another big challenge for ethio telecom with the current foreign currency shortage all over the country. This seriously affected ethio telecom's supply chain management performance by taking longer time to deliver products. Communication inefficiency also ranks high as one of the common supply chain performance hindering factor in ethio telecom. Suppliers and customers alike require constant monitoring and at least some level of collaboration to ensure supply meets demand. Sometimes suppliers may not deliver the right quality after their technical proposal is validated which had seriously impacted on the supply chain efficiency of Ethio telecom.

Furthermore, the users/client department's front line staffs do not come with a clear requisition and this caused the dalliance on the supply. Their demand fluctuates over time. Though, the user departments are requested to submit their plan for sourcing department three months in advance, rapid changes in demand and unplanned requisition from customers were raised as a great challenge. Also lack of clearly defined specifications/requirements with detailed technical specification to ensure suppliers to participate and provide the right product to the tenders floated were mentioned as major challenge. This lack in the organization's personnel skills and commitments slowed the operational quality and also affected the buyer to carry out effective supplies on the client's preference and between suppliers to get a desirable out come in supply chain performance of the company's logistics system.

CHAPTER FIVE

CONCLUSION, IMPLICATIONS AND RECOMMENDATIONS

5.1 Conclusions

As discussed in the previous chapters, this research is carried out to assess the roles of transportation facilities on boosting supply chain performance taking the case of Ethio telecom. To that effect, after reviewing different literatures and previous studies, a research frame work was designed and roles of transportation in boosting supply chain performance were identified. The roles of transportation quality parameters for boosting the supply chain performance; namely, delivery in/on time, customer response time, right quality of supplies and low cost/price – were analyzed. Based on the findings from various sources of data using the methodology adopted for this study, the following conclusions have been carefully drawn:

- There is a positive and significant relationship between transportation facility and logistics supply chain management performance of Ethio telecom. This implies that a good transport system in logistics supply activities could provide better logistics efficiency, reduce operation cost, and promote service quality. The improvement of transportation systems needs the effort from both public and private sectors who are engaged in the supply chain of the Ethio telecom logistics supply systems. Thus, the study revealed that a well-operated logistics supply system could increase both the logistics supply performance and the business profitability of the company.
- For those products with small volume, low weight and high value, transportation cost simply occupies a very small part of sale and is less regarded; for those big, heavy and low-valued products, transportation occupies a very big part of sale and affects profits more, and therefore it is more regarded.

- Despite the independent variable role of transportation have positive strong correlation with the dependent variable supply chain performance, and have great potential to affect the performance of the supply chain of ethiotelecom, the level of supply performance were found to be minimal as a result of mainly transportation cost variances.
- It is important that smooth and efficient operations of every link in the supply chain should be taken care of. Furthermore, the result from the interview confirms that ethio telecom has SC management challenges related to inventory management, communication, delivery and customer response time, and inadequate planning.
- Uncertainties both from customers and suppliers created delays and bottlenecks that hampered the performance output of the supply chain. Operational reliability including delivery timing and trust was a concern at different levels. Trust was very much an issue between departments within the same company where attitudes were polarized between stakeholders.
- Less attention has been paid to both the identification of the fundamental components of integration of transportation with the customer expectations and logistics supply system. In addition, the misunderstanding of the role of integration on the performance of a transport facilities and supply chain jointly boost the satisfaction of the customers as indicated in the mean value of the sum of the customer services practices are measure only 3.0318 as per the Likert scale index. The standard deviation is also between .72376 and 1.78315 values which indicates that the operational quality and customer satisfaction has a reasonable level of deviation from the standard of the company. Therefore, as 0.7 implies in Corvachoov's Alpha, the lowest possible acceptable standard of transportation operation quality in line with customer satisfaction, the Ethio telecom need to revitalize its transportation facilities uses in an integrated manner.
- There is a lack of close cooperation between ethiotelecom (Sourcing) with its customers (internal user departments) and suppliers. It would appear that the supply chain management strategy has not yet been well devised and implemented to its fullest extent in the Ethio telecom.

This work complements other studies dedicated to understanding the organisation's transport management and Facilitation of transport chains boost performance of supply chains. The framework used can assist transport agents in identifying unexploited opportunities for enhancing integration or mitigating negative aspects. It can also support policy makers, for example, in efforts to prioritize investments in accordance with their potential impact on integration. Finally, as the framework provides details on how agents interact, it can support the development of freight transport models, particularly using disaggregated transportation approaches to enhance logistica supply chain performance in a business company.

To sum up, transportation play a relevant role in logistics supply chain management performance. Transportation and logistics systems have interdependent relationships that logistics management needs transportation to perform its activities and meanwhile, a successful logistics system could help to improve traffic environment and transportation development. Transportation also plays an important role in logistics system and its activities appear in various sections of logistics processes. Without the linking of transportation, a powerful logistics strategy cannot bring its capacity into full play of the logistics supply performance. Therefore, since transportation contributes the highest cost among the related elements in logistics systems, the improvement of transport efficiency could change the overall performance of a logistics system across the operational channels of the company.

5.2 Implications of the Study

The important conceptions found out from this study imply the following key elements;

- Transportation facilities boosted the supply chain performance of the EthioTelecom and is working at a moderate scale meeting more or less the current organization's logistics supply demand as per the finding of the study. However, the transportation facilities management and logistics supply policy has to be more dependable. Thus, it needs improvements in the supply chain performance significantly for fully cover the performance level demand of the organization's business as per the set standard of the company which is estimated to be 95% by 2025.

- Boosting the level of customer's satisfaction and conducting external markets analysis is importance to revise the logistics supply chain policy of the company.
- The alliance between middle-small size Transportation services companies is an important trend needed to boost the supply chain performance of Ethio telecom in the future. The strategy could help to expand service areas and increase service quality, and meanwhile raise the loads of transportation from single trips to reduce delivery costs.
- The review of concepts and practices in roles of transport systems provides a clearer notion on transport applications in logistics activities advancements and thereby can boost the general supply chain management performance of the company.

5.3 Recommendation

Based on the conclusions indicated in the above section, some significant recommendations are proposed to alleviate the problems encountered by Ethio telecom.

- Improvement of Transportation facilities. The advancement and development of logistics are based on several techniques and complete theories. High-tech facilities and systems could bring more possibilities and advantages to logistics supply performance of the company. For example, the improvement of related facilities, e.g. Forklift Trucks, is necessary for transport efficiency. In the future, factory automation is the main target for the whole supply-chain procedures. It would enable to improve efficiency and also reduce the operation costs.
 - Ethio telecom ought to realize effective use of pertinent, timely, and accurate transportation facilities to achieve common goals of supply chain efficiency to build higher level of trust between departments, customers and suppliers.
 - Strategic Channel cooperation between companies might have devised by the company. In order to save the logistics costs, a key concept is to maximize the usage of available transport capacity. Integrating the logistics demands between numerous departments

helps achieve this purpose. Accordingly, a conglomerate should develop its own logistics service for the branches to enable easy accessibility by the respective customers.

- Ehtio telecom need to work towards supply chain collaboration to reduce transportation costs. Companies that collaborate effectively across the supply chain have enjoyed dramatic reductions in inventories and costs, together with improvements in speed, service levels, and customer satisfaction.
- Dependable policy frameworks of Transportation Management and Logistics supply strategy has to be revised and used effectively as a principle of declaration by Ethio telecom.
- Ethio telecom has to enter into service level agreements with stakeholders like Ethiopian Revenue and Customs Authority, Ethiopian Airlines and Ethiopian Shipping and Logistics Service Enterprise to reduce delivery time as this helps to make delivery fast, which further improves service level and customer satisfaction. Use of a real-time information system among ethio telecom, its customers, suppliers and stake holders would alleviate both delivery time and inventory problems.
- Ethio telecom might engage in integrated transportation planning and review logistics supply chain performance periodically and pave the way for continuous improvement to enhance the overall supply chain performance by reducing the operation costs, especially of transportation facilities
- Having an integrated inventory management strategy such as accurate inventory recording, periodic inventory counting, stock planning and optimal inventory utilization, implement fleet control system, cost-effective and responsive transportation system is required.
- As the concept of transport facility and supply chain management is so complex by its nature and involves a network of diverse companies in the effort of producing and delivering a final product, its entire domain cannot be covered in just one study.

Therefore, future research can expand the horizon of enhanced transportation facilities use by considering external customers examine the different options of modes of transportations and the necessary dimensions such as geographical proximity, JIT/lean capability, cross-functional coordination, logistics integration, facilities upgrading and ensuring implementation of agreed supply chain management strategy should become on frontline to increase efficiency of the logistics performance of the company as termed in this study. The future studies should also concentrate on the relationships/dependencies among dimensions of supply chain management practices for boosting logistics supply performance across the company.

- The standard of transportation facilities might have given special attention to attain the supply chain performance standard of the company as well as the national standard in Africa.

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Appendix-1

Questionnaire for the research project entitled **The Role of Transportation in Logistics Chain Performance in Ethio-Telecom Company**

Respondents Notice:

*This questionnaire is designed to collect the data on the role of **Transportation in Logistics Chain Performance in Ethio-Telecom Company** from the Logistics operation Department Staffs and Line Managers. Thus, the researcher kindly requests all the participants to attempt to answer all relevant questions attentively. The researcher discloses that all the data shall be used for this research purposes only.*

Part I: Demographic Data of the Respondents:

1. Sex-----
2. Department of the respondent
3. Educational Back Ground:
A. Diploma B. Diploma C. Degree D. MA/MSc Degree E. PhD
4. Number of employees in Charge of Logistics Services Department at Head Quarter-----
5. Years of Work Experience -----

Part two – Questions related to Transportation Facilities and Supply Chain practice

1. Effective systems of transportation boost efficiency in logistics supply performance.
Strongly agree Agree neither agree nor disagree Disagree strongly disagree
- 4 Efficient Transportation systems timely delivery is safe to value damage of goods
Strongly agree Agree neither agree nor disagree Disagree strongly disagree
- 5 Transportation channels and equipments used enable fast supply and satisfy your customer.
Strongly agree Agree neither agree nor disagree Disagree strongly disagree
- 6 The company reaches economies of scale and economies of distance to reduce cost

Strongly agree Agree neither agree nor disagree Disagree strongly disagree

7 Our transportation service is cost efficient

Strongly agree Agree neither agree nor disagree Disagree strongly disagree

8 The overall quality of our transportation is very high

Strongly agree Agree neither agree nor disagree Disagree strongly disagree

9 Our transportation cost is affordable in comparison with the market.

Strongly agree Agree neither agree nor disagree Disagree strongly disagree

10 Our transportation service gives quick response to special requests from clients

Strongly agree Agree neither agree nor disagree Disagree strongly disagree

Part three – Questions related to Transportation Facilities Used practices

I. Challenges affecting transportation practice

Factors stated below affect the transportation performance operation.

Please show their degree of effect on transportation operation of your company.

Challenges	Rating				
	1 Very low	2 Low	3 Moderate	4 High	5 Very high
Professional Qualification of staffs					
Employee negligence/ performance					
Inadequate training/Skill level					
Poor team cooperation among staffs					

II. Non-human factors challenges affecting transportation practice

Non-human factor challenges stated below are believed to affect transportation performance operation.

Please show their degree of effect on transportation operation of your company.

challenges	Rating				
	1 Very low	2 Low	3 Moderate	4 High	5 Very high
Lack of adequate and modern equipment					
Substandard trucks					
Infrastructure problems					
Missed schedules					
Higher rate of loss and damage					
Excessive loading and unloading					
High traffic jam in cities					

Part four – Questions related to Transportation Role in boosting Logistic Supply

The under listed items are meant to measure role of transportation in your company. Therefore please put the sign to show your answer.

Transportation Facility roles	Strongly disagree	disagree	Neutral	Agree	Strongly agree
1. connecting	1	2	3	4	5
Your company's transportation is efficient in moving materials and information					
4. storage					
Using transportation as a means of storage is a common practice in your company					
5. creating time place and possession utility					

Your transportation deliver input at the right time					
Your transportation service deliver products to customers on time					
Your transportation service deliver products to the right place needed					

Part five – Questions related to three dimensions of Logistics Performance

I. Logistics Differentiation

The under listed items are asked to measure how different is your logistics operation from other Competitors in the industry. Therefore please put the sign /√/ on the appropriate answer.

Logistics differentiation	Rating				
	Far below competitors	Below competitors	Neutral	Above competitors	Far above competitors
	1	2	3	4	5
Percentage of damage free deliveries					
Stock of finished goods inventory					
Forecasting accuracy					
Lead time (time between order and delivery)					
Percentage of on time delivery					
Time it takes on back order					
Total inventory					

II. Logistics Efficiency

The under listed items are asked to measure efficiency of logistics operation of the company.

Therefore, please answer the questions by putting the sign/√/ on the rating provided.

Logistics efficiency	Rating				
	Very poor	poor	Neutral	Good	Very good
	1	2	3	4	5
Number of order shipped on time					
Percent of shipment requiring expending					
Inventory turn per year					
Average order cycle time(time in between order and delivery)					

III. Logistics Effectiveness

The under listed items are asked to measure effectiveness of logistics operation of the company.

Therefore, please answer the questions by putting the sign/√/ on the ratings provided.

Logistics effectiveness	Rating				
	Much worse	Worse	Neutral	better	Much better
Sales in birr					
Transportation cost					
Warehousing cost					
Inventory cost					

Appendix-2: Interview and group Discussion checklists

1. At what capacity the head office transportation facility operating the logistics supply?
2. The number of customers and outsourced vendors?
3. Number of main and branch stores and warehouses?
4. Types and total transport facilities used for supply operation
5. The transportation capacity of transportation facilities
6. Average distance from the warehouse to the supply distribution
7. The outstanding transportation loads in tones and costs incurred
8. The Utility costs in annum
9. The personnel's costs in annum
10. Annual revenues generated
11. The standard of logistics supply compared in African standard
12. The current operational quality of supplies delivery time against the operational standard

Annex-3; Observational Interpretation Questions Checklist

13. Are the transportation facilities operate to the standard of the logistics supply procedural manual?
 - a. Yes b. no
2. The warehouse operations of the supplies
3. The loading and unloading practices at head office main warehouses and branch warehouse
4. The time span used to package a single transaction of logistics supplies
5. The types of vehicles and trucks used for carrying and transportation of supplies and services
6. The shops operation as per the demand of the customers outlined
7. Congestion of Bills and orders by customers and outsourced vendors by Ethiotelcom
8. The services orientation of staffs and politeness in handling customers
9. The storage capacity and goods stored in the warehouses
10. Inventory operations and quality of inventory