ADDIS ABABA UNIVERSITY SCHOOL OF COMMERCE

DEPARTMENT OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT

THE ROLE OF TRANSPORTATION IN LOGISTICS CHAIN PERFORMANCE THE CASE OF EAST AFRICA BOTTLING SHARE COMPANY

BY

SAMUEL WORKNEH

A thesis submitted to Addis Ababa University School of Commerce in partial fulfillment of the requirements for the Degree of Masters of Art in Logistics and Supply Chain Management.

July, 2016

ADDIS ABABA UNIVERSITY

SCHOOL OF COMMERCE

THE ROLE OF TRANSPORTATION IN LOGISTICS CHAIN PERFORMANCE THE CASE OF EAST AFRICA BOTTLING SHARE COMPANY

By: Samuel workneh

Approved by board of Examiners and Advisor:

Advisor	_____	_____
	Signature	**Date**
Internal Examiner	_____	_____
	Signature	**Date**
External Examiner	_____	_____
	Signature	**Date**

Declaration

I, Samuel Workneh declare that this paper is a result of my independent research work on the topic entitled **"The role of transportation in logistics chain performance the case of East Africa bottling share company"** in partial fulfillment of the requirements for the Degree of Masters of Art in Logistics and Supply Chain Management at Addis Ababa University. This work has not been submitted for a degree to any other university. All the references are also duly acknowledged.

Samuel Workneh

Signature_____

Date July.2016

Confirmation

This is to certify that **Samuel Workneh** has carried out this research work on the topic entitled **"The Role of transportation in logistics chain performance the case of East Africa Bottling Share Company"** under my supervision. This work is original in nature and has not been presented for a degree in any University and it can be submitted for the partial fulfillment of the requirements for the award of the degree of Masters of Art in Logistics and Supply Chain Management.

Solomon Markos (PhD)

Signature_____

Date _____

Acknowledgement

Glory to the almighty God I started with this word because without fatherly support from our heavenly father not only the paper but every step of my life will and definitely be meaningless I ones again would like to thank the almighty God.

The person I would like to appreciate is Dr Solomon Markos who shaped my paper and brought me back to the track while I was not in a position to finalize the paper I also would like to pass my appreciation and respect to Mr Busha Temesgen for his restless support and advice may God bless you

Finally I would like to thank my sisters' Weynshet and Hawi borothers Tsegya and Tamerat including friends for their relentless moral to accomplish this paper. The special one Elshaday thanks for your love, moral and support

Last but not least I would like to pass my heartfelt appreciation to Logistics staffs of East Africa Bottling Share Company for administering my questionnaire specially M/r Tafesse Referal thanks a lot.

Table of Contents

LIST OF TABLES

LIST OF figures

Abstract

Effective logistics chain management has become a potentially valuable way of securing competitive advantage through enhancing operational and improving organizational performances since competition is so high and growing from time to time. This paper by considering this fact and central role of transportation at every logistics activity, performed the study by identifying roles of transportation (connecting, storage and creating time and place utility) and logistics performance dimensions (logistics differentiation, effectiveness and efficiency) in order to see the relationship between transportation and logistics chain performance. The data to conduct the study was collected from 82 staff of the company using questionnaire. the practice of transportation was analyzed using descriptive statistics like mean and standard deviation as per the result weakness observed in areas of timely reply to special enquiry, flexibility and some human and non human factors affecting performance of transportation is identified. The relationships proposed in the framework were tested using Pearson correlation, and the causal relations were analyzed using regression analysis. From the result of the analysis it is concluded that there is strong relationship between role of transportation and Logistics chain performance and between transportation practice and logistics chain performance also the relationship between the roles of transportation and logistics performance dimension is strong. Hence, it is to the benefit of the company to give due emphasis to improving transportation service in order to benefit from better logistics performance.

Key words: Logistics chain, Transportation, Role

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

At the heart of every supply chain, there exists relationship between supplier and the organization and between the organization and its customers. Upstream and downstream integration with supplier and customer is an important element of manufacturing strategy. Part of supply chain that plays the vital role in the forward and reverse flow is logistics (Tracy, 2004).

Logistics can be defined in different ways.

- 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 customer‘s requirements (Green *et.al*, 2008).
- 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 distributers and final customers all requires the service of the transportation unit at each and every of the activities involved. The role of transportation is unquestionable especially in companies like coca cola, where there

exists a great deal of reverse logistics and day to day supply of finished goods to customers. Transportation plays a vital role in moving raw materials, finished goods, utilities and the manpower involved in all those activities. (Srinavas,2005)

The effectiveness of the transportation service have an impact in the movement of raw materials, finished goods, utilities , ware house management , on distribution outlets also on production performance as coca cola company requires reversed empty bottles for refill purpose and the collection effectiveness of empty bottles on the other hand depends on effective transportation (Tracy,2008).

- 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 (Srinavas, 2005).
- 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.

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

Storage- less visible aspect, more expensive, used at origin or destination; and during diversion. (coyl.*et.al*, 2010)

Transportation plays different role in logistics as the physical link connecting the firm to its suppliers and customers, as a nodes and links scenario, transportation is the link between fixed facilities (nodes). It also adds value to the product by providing time, place & quantity utility for the firm‘s goods. When firms engage in global competition transportation costs are becoming even more significant. Out of which, outbound transportation was clearly the largest component of total physical distribution costs.

In general, transportation is the base of efficiency and economy in business logistics and expands other functions of logistics system. (coyl.*et.al*, 2010)

Without well-developed transportation systems, logistics could not bring its advantages into full play. 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. A well-operated logistics system could increase both the competitiveness of the government and enterprises (Tracy, 2004).

The Coca-Cola Company was born On May 8, 1886 in Atlanta, Georgia and at present the beverages consumed in more than 200 countries with over 1.6 billion servings each day. Coca-Cola was first bottled in Ethiopian‘s capital Addis Ababa in 1959 by the Ethiopian Bottling Share Company and later opened a second branch in Dire Dawa in 1965. The two plants were nationalized in 1975 and ran as public companies until 1996 when they were bought by the Ethiopian Entrepreneurs. Just prior to this, in 1995, Coca-Cola Sabco bought shares in the business and in 1999 signed a joint venture agreement with the plants and in 2001 increased its

share to 61% and the company changed its name to the East Africa Bottling Share Company(Nelson, Ishikawa & Geaneotes,2009). The company has the mission to continually increase profitability, sustainable unit case sales of its products by satisfying new and existing consumers through excellent market execution and utilizing a wide range of distribution methods.

1.2. Statement of the Problem

The ultimate objective of logistics is to enhance total value offered to customers, be they are other companies in the chain or the ultimate consumer. Among the components of business logistics, transportation is the most important economic activity. It also accounts for one third to two third of the expenses of logistics costs. A transportation system that provides a reliable service level reduces supply chain uncertainty and the amount of inventory required throughout the chain. Rapid and effective response in moving materials and information within a short time period are crucial and transportation is a key element in making this happen. (Hummels, 2001)

Transportation provides the physical link between the supply chains geographically dispersed operation and it is possible to manage proactively in today‘s deregulated environment to provide a competitive advantage. Transportation also involves in reverse logistics as operation of East Africa bottling share Company is involved in reverse logistics in collecting bottles back to the factory for refill. In such a case the effectiveness of reverse logistics have a great impact on other operation especially on the manufacturing activity of the company. In the supply side the effectiveness of transportation activity will hamper the production process as production is mainly dependent on availability of raw material which in turn will affect the rest of logistics activity. Transportation also affects the management of warehouse and stock management. If there is no efficient transportation service in the company, there will be shortage as well as

excess stock available which will affect both the delivery service and also increase holding cost of the stock which finally will dissatisfy the distributer outlets as well as final consumer as the main aim of logistics is to satisfy the end customers by enhancing the logistics activity all over the chain. In effective transportation will hamper the whole logistics operation from end to end it will affect the stock which have an impact on holding cost, inventory management, production which results from shortage of raw material, unavailability and quality of bottles to be refilled, delivery capacity of finished goods in other words the whole operation of the company will be affected to a great extent. The activity of reverse logistics also decides the fate of production unit as East Africa Bottling Share Company mostly uses collected empty bottles for refill purpose, unless the bottles are collected timely and routinely without breakage, it will affect the production process including quality and the cost of replacing damaged bottles will also increase cost of production.

As per the preliminary interview conducted with the logistics and transport personnel of the company, there exists transportation related problems in the day to day operation of the company from providing excellent service by disturbing the logistics chain. The problems are related with human factor 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 team work and inadequate training.

The non human factors are lack of adequate and modern equipments, substandard trucks , infrastructure problems, missed schedules, higher rate of loss and damage, excessive loading and unloading time, high traffic jam in cities like Addis Ababa are the problems extracted from the interview.

1.3. Objective of the Study

The objective of the study was to examine the role of transportation in logistics chain in East Africa Bottling Share Company with specific objectives;

- To assess the transportation practice of East Africa Bottling Share Company
- To determine the contribution of transportation towards logistics performance
- To identify factors affecting effective transportation operation

1.4. Research Questions

1. What are the practices of transportation and related problem in East Africa Bottling Share Company?
2. What are the roles played by transportation towards logistics performance?
3. What are the factors affecting effective operation of transportation in the East Africa Bottling Share Company?

1.5. Significance of the Study

In today‘s competitive environment and growing market demand, excelling in every aspect of operation is must to win the market. In companies like East Africa Bottling share company, 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. The study will also benefit the customers of the company as the findings will provide solutions for problems in the transportation section which in turn results in reduced cost and customer satisfaction. Distributers of product of the company will also benefit from the improved transport service. The study will also help 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 operations.

1.6 Delimitation

The study focuses on assessing; the role of transportation on logistics chain performance of the East Africa Bottling Share company by identifying factors or problems that hinder transportation from playing a healthy role in the chain. The paper only focuses on the practices of transportation, related problems and the roles of transportation within the parameters and methodologies of the paper employed.

1.7. Limitation of the Study

The limitation of the study is the accessibility to the required data as employees in the Logistics department is too busy to provide the necessary information in felling the questionnaire and conducting interview.

1.8. Organization of the Paper

With regard to the organization of the paper, the paper has five chapter which deals with different subject. The first chapter is the introductory part and it contains background of the study, statement of the problem, objective of the study, significance of the study, data collection, method of analysis and presentation. Chapter two contains review of related literature in the subject matter in chapter three methodology employed will be discussed in detail. The forth chapter deals with the analysis and presentation of the data collected. In the final chapter the data collected and analyzed in the previous chapters will be summarized and conclusions and recommendations will be made based on the summary.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 OVERVIEW OF LOGISTICS

2.1.1. Definitions

Logistics can be defined in different ways. Even if the definition varies, the definitions all are almost the same. To see some of the definitions;

According to the Council of Logistics Management (1991) 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'.

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 a firm. Physical distribution refers to the movement of goods out ward from the end of the assembly line to the customer. Finally, supply-chain management is some what larger than logistics, and it links logistics more directly with the user's total communications network and with the firm's engineering staff.

Logistics is generally the detailed organization and implementation of a complex operation. 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.

2.2.Logistics Management: is the part of supply chain management 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 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."

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

2.3. Logistics Activities and Fields

A basic distinction in the nature of logistics activities is between inbound and outbound logistics.

2.3.1. Logistics Activities

2.3.1.1 Inbound Logistics: is one of the primary processes of logistics, concentrating on purchasing and arranging the inbound movement of materials, parts, and/or finished inventory from suppliers to manufacturing or assembly plants, warehouses, or retail stores (Tracy, 2004).

2.3.1.2 Outbound Logistics: is the process related to the storage and movement of the final product and the related information flows from the end of the production line to the end user (Tracy, 2004).

2.3.2 Logistics Field

Given the services performed by logisticians, the main fields of logistics can be broken down as follows:

2.3.2.1 Procurement Logistics: consists of activities such as market research, requirements planning, make-or-buy decisions, supplier management, ordering, and order controlling. The targets in procurement logistics might be contradictory: maximizing efficiency by concentrating on core competences, outsourcing while maintaining the autonomy of the company, or minimizing procurement costs while maximizing security within the supply process.

2.3.2.2. Distribution Logistics: has, as main tasks, the delivery of the finished products to the customer. It consists of order processing, warehousing, and transportation. Distribution logistics is necessary because the time, place, and quantity of production differ with the time, place, and quantity of consumption.

2.3.2.3 Disposal Logistics: has as its main function to reduce logistics cost(s) and enhance service(s) related to the disposal of waste produced during the operation of a business.

2.3.2.4. Reverse Logistics: denotes all those operations related to the reuse of products and materials. The reverse logistics process includes the management and the sale of surpluses, as well as products being returned to vendors from buyers. Reverse logistics stands for all operations related to the reuse of products and materials. It is "the process of planning, implementing, and controlling the efficient, cost effective flow of raw materials, in-process inventory, finished goods and related information from the point of consumption to the point of origin for the purpose of recapturing value or proper disposal. More precisely, reverse logistics is the process of moving goods from their typical final destination for the purpose of capturing value, or proper disposal. The opposite of reverse logistics is forward logistics.

Products may reverse direction in the supply chain for reasons of manufacturing returns, commercial returns, product recalls, warranty returns, service returns, end-of-use returns and end-of-life returns.

2.3.2.5. Green Logistics: describes all attempts to measure and minimize the ecological impact of logistics activities. This includes all activities of the forward and reverse flows. This can be achieved through intermodal freight transport, path optimization, vehicle saturation and city logistics.

2.3.2.6 Asset Control Logistics: companies in the retail channels, both organized retailers and suppliers, often deploy assets required for the display, preservation, promotion of their products. Some examples are refrigerators, stands, display monitors, seasonal equipment, poster stands & frames.

2.3.2.8. Emergency Logistics (**Humanitarian Logistics**): is a term used by the logistics, supply chain, and manufacturing industries to denote specific time-critical modes of transport used to move goods or objects rapidly in the event of an emergency. The reason for enlisting emergency logistics services could be a production delay or anticipated production delay, or an urgent need for specialized equipment to prevent events such as aircraft being grounded (also known as "aircraft on ground"—AOG), ships being delayed, or telecommunications failure. Humanitarian logistics involves governments, the military, aid agencies, donors, non-governmental organizations and emergency logistics services are typically sourced from a specialist provider.

2.3.2.9. **Production Logistics:** describes logistic processes within a value adding system (ex: factory or a mine). Production logistics aims to ensure that each machine and workstation receives the right product in the right quantity and quality at the right time. The concern is with production, testing, transportation, storage and supply. Production logistics can operate in existing as well as new plants: since manufacturing in an existing plant is a constantly changing process, machines are exchanged and new ones added, which gives the opportunity to improve the production logistics system accordingly. Production logistics provides the means to achieve

customer response and capital efficiency. Production logistics becomes more important with decreasing batch sizes. In many industries (e.g. mobile phones), the short-term goal is a batch size of one, allowing even a single customer's demand to be fulfilled efficiently. Track and tracing, which is an essential part of production logistics due to product safety and reliability issues, is also gaining importance, especially in the automotive and medical industries.

2.3.2.10 Business Logistics

One definition of business logistics speaks of "having the right item in the right quantity at the right time at the right place for the right price in the right condition to the right customer". Business logistics incorporates all industry sectors and aims to manage the fruition of project life cycles, supply chains, and resultant efficiencies.

The term "business logistics" has evolved since the 1960s due to the increasing complexity of supplying businesses with materials and shipping out products in an increasingly globalized supply chain, leading to a call for professionals called "supply chain logisticians".

In business, logistics may have either an internal focus (inbound logistics) or an external focus (outbound logistics), covering the flow and storage of materials from point of origin to point of consumption (see supply-chain management). The main functions of a qualified logistician include inventory management, purchasing, transportation, warehousing, consultation, and the organizing and planning of these activities. Logisticians combine a professional knowledge of each of these functions to coordinate resources in an organization.

There are two fundamentally different forms of logistics: one optimizes a steady flow of material through a network of transport links and storage nodes, while the other coordinates a sequence of resources to carry out some project (e.g., restructuring a warehouse).

2.4. Achieving Logistics Efficiency and Effectiveness Requires

- Improved efficiency of each mode of transport;
- Coordination and seamless interchange of different transport modes;
- Effective integration of all supply chain management functions (including demand management, supply management, manufacturing, storage, transport, distribution, and value-added services); and
- Enhanced collaboration among supply chain partners (e.g., suppliers, manufacturers, distributors, and end users).

2.5. Logistics Service Value

As (Swartz, 2010) stated in his article, there are different conceptualizations of the process by which logistics service creates value. The traditional conceptualizations are based on the creation of time and place utilities. (Mentzer *et al*., 1989) The often quoted ―Seven Rs" 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 sited 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) sited by Swartz.

More recent definitions of logistics service 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). When traditional attributes of logistics service are modified to create value-added services or are configured in unique bundles,

they take the shape of logistics capabilities that can be a source of competitive advantage (Morash *et al*., 1996; Lynch *et al*., 2000). Thus, in their quest for new ways to establish a competitive edge, managers are recognizing that unique types of customer value can be created through logistics service (Langley and Holcomb, 1992).

Creating customer value and sustaining competitive advantage through the delivery of unique or value-added logistics services can be a challenging process because they involve changing the way logistics managers and organizations work. To do so, it is necessary to understand how logistics creates value. 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).

2.6. Transportation

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 oftransport include air, rail, road, water, cable,pipelinee 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 (Coyl *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

2.7. Modes of Transportation

There are different modes of transportation. The common modes of transportation include Truck, Rail, Air, water, pipeline, multimodal, and package carriers.

Air- can transport both passengers and cargo. Have a fixed cost in infrastructure and equipment. Labor and fuel costs are largely trip related and independent of the number of passengers or amount of cargo carried on a flight.

Truck- have the advantage of door to door shipment and a short delivery time and it consists of two major shipments in the industry TL(Truck load) whereby charges for full truck independent of the quantity shipped and LTL(Less than truck load) in which charge is based on the quantity loaded and distance travelled

Rail-incurs a higher fixed cost in terms of rails, locomotives cars, and yards. It is convenient for large shipments over large distance.

Water- Is ideally suited for carrying very large loads at a lower cost.

Pipeline-used for transportation of crude petroleum, refined petroleum and natural gas products and requires significant initial fixed costs.

Multimodal- uses more than one mode of transport to move a shipment to its destination.

Package Carriers- carry small packages ranging from letters to shipments weighing about 150 pounds by using air, truck or rail to transport time critical smaller packages.

2.8. Transportation and Logistics

Transport is a central ingredient in the time and spatial economic utility of products and services. Multimodal transport, which combines the advantages of each mode, can be a particularly efficient and effective approach.

Logistics is a process of planning, implementing, and controlling the efficient flow of products, information, and funds to conform to the client‘s requirements. Transport is a core component of logistics, moving goods between different points in the supply chain. Logistics encompasses the storage of raw materials, work-in-process parts, and finished products, as well as a variety of value-added services.

2.9. The Effects of Transportation on Logistics Activities

According to (Sreenivas and Sirinivas, 2001) 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. 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. These developments reflect factors such as better transport services and pressures to improve logistics performance.

2.10. The Role of Transportation in Service Quality

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. (Sreenivas and Sirinivas, 2001)

2.11. Measuring Transportation Performance: allows the firm to identify problem areas and then make changes, resulting in improved transportation services. Measures of performance can be compared against predetermined standards, competitive benchmarks, or previous period performances to identify problems. These are transportation cost, percent on-time deliveries.

2.11.1. Financial Metrics 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, EDI/VAN 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.

2.11.2. Productivity Metrics Transportation productivity metrics fall in two categories: transportation asset productivity and transportation operator productivity. 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, or pallets delivered per person-hour.

2.11.3. Quality Metrics Transportation quality and reliability are just as important, if not more important, than cycle time. 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).

2.11.4. Cycle Time Metrics 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 Chiung-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. 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 the 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 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 (Coyl *et.al*, 2011).

As stated by (Lata Chatterjee and Chiung, 2001) transportation is only one component of integrated logistics management, the current trend is toward increasing it‘s contribution, and thereby, it's critical importance. Transportation, in the knowledge economy, is not limited to just movement of goods across space. It no longer only performs a mere pre production (moving inputs) and postproduction (delivering outputs) linkage function. It is a value-adding component that is incorporated in to strategic management and operational decisions of firms through transportation logistics. 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.

2.12. Empirical Findings

(Michael Tracy,2004) 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 happens. 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.

On the other hand, poor transportation performance causes excessive freight cost and increased inventory holding cost and is a major obstacle in Implementing and realizing gains from competitive manufacturing strategies such as lean production.

Empirical findings supports the notion that superior delivery service has a positive impact on a manufacturers performance in terms of sales growth, return on assets, market share gain and overall competitive position.

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 and meanwhile, a successful logistics system could help to improve traffic environment and transportation 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.

It is also stated that transportation is fast becoming a key factor in determining the difference between profit and loss. It is the essential link between the extraction of natural resources; the fabrication of industrial, commercial, and consumer products; and the final distribution of goods to wholesalers, retailers, and end users.

In all of the empirical findings problems that hinders transportation from playing its role is not mentioned therefore the findings of this paper might give explanation on the problems of

transportation in the East Africa Bottling Share Company along with the solutions that will be recommended in order for the logistics chain performance improvement.

2.13. Conceptual frame work

From the above literatures gathered, it is possible to come up with conceptual frame work of the paper.

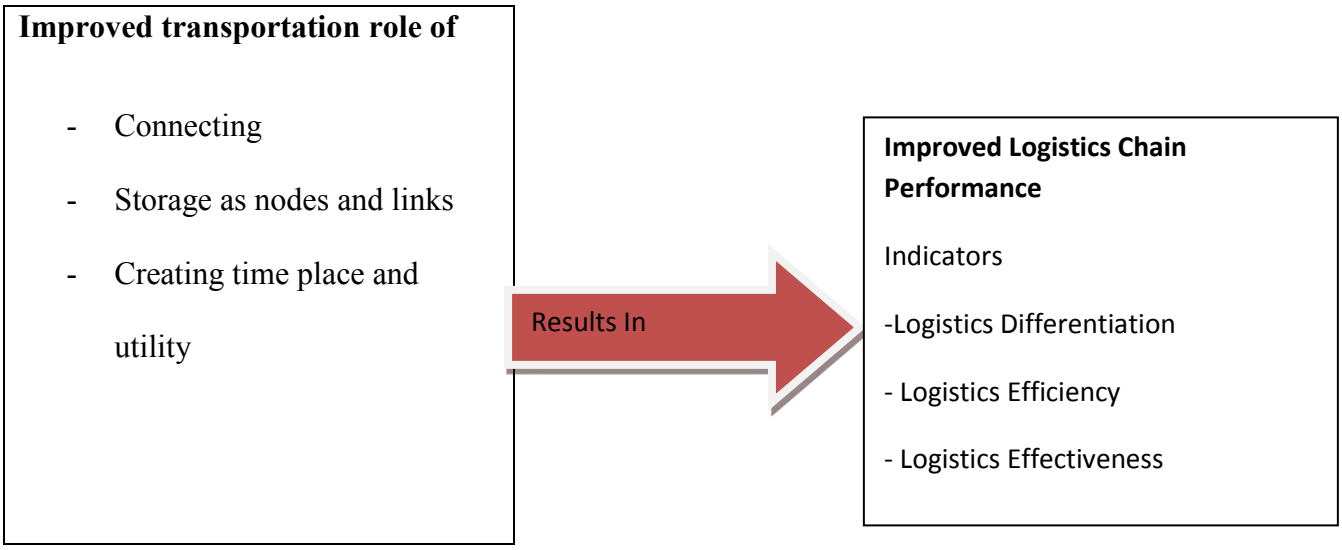

Fig 1 conceptual frame work

Source Author

The conceptual frame work shows that transportation plays a significant role in the logistics chain 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 can also be used as a storage 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 end customers. 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 and the means of providing products at the time and place required is the role of transportation.

CHAPTER THREE

Research Methodology

3.1. Research Methodology

3.1.1 Design of the Study

The research design is explanatory that was conducted on the role of transportation in logistics chain performance of the East Africa bottling Share Company, as explanatory research helps to see the relationship between variables. In order to do the research, both qualitative as well as quantitative type of data was used in order to get full information. The data was collected by conducting in-depth interview from different logistics activities including the production unit, transportation, and warehouse and distribution outlets.

3.1.2 Data Type and Source

The type of data collected includes 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, review of different manuals, journal with regard to the transportation and logistics activity of the East Africa Bottling Company were studied in more detail. The primary data is collected from employee of the East Africa Bottling Share Company and distributers.

3.1.3 Sample of the Study and Instrument

The population of the study encompasses employee of the East Africa Bottling Share Company logistics department including transportation, official distributer of the product and head of departments like logistics, transportation, warehousing and distribution. The population is 160 and as per the sampling method stated below, the sample size is 108.Official distributer of the product and head of departments like logistics, transportation, warehousing and distribution was

interviewed The sampling method that was used is purposive sampling in order to get appropriate data from employees directly related with the transportation, logistics, store production, and distribution centers because the data that can be gathered from those people is helpful to get first hand information about the role that the transportation plays in the day to day operation of the logistics unit.

Sample size determination formula

n=N/1+N (e) 2

Where n is number of respondents

N stands for total population

e stands for error term of 5%

Source Yemane(1967)

3.1.4. Data Collection

The data was collected with the help of questionnaire and close ended questionnaire was conducted from purposively selected individuals that took place in the East Africa Bottling share company with different departments like logistics, transportation, warehouse, manufacturing including OCCD (official coca cola Distributers) units in Addis Ababa

3.1.5 Method of Data Analysis

The paper employed regression analysis method since it used to capture a cause and result relationship model. That means well-organized transportation system will positively contribute to logistics performance. Those factors that affect transport system were organized and calculate their regression on transport performance and logistics as well. In order to see transportation practice of the company, descriptive statistics was employed

3.2. Validity and Reliability

According to (Bryman and Bell, 2007), reliability analysis is concerned with the internal consistency of the research instrument. As multiple items in all constructs were used, the internal consistency/reliabilities of transportation practices, role of transportation, and logistics chain performance were assessed with Cronbach‘s Alpha and the reliability values for all constructs are confirmed as greater than 0.7, which are considered acceptable (Nunnally, 1978). The following table shows the summary of reliabilities of all constructs.

Table 3.1 Reliability test

Transportation provides logistics efficiency	.765
Transportation systems timely delivery and safety satisfy customer	.784
The company reaches economies of scale and economies of distance to reduce cost	.785
Transportation service of our company is flexible	.795
Transportation service of our company is cost efficient	.772
The overall quality of our transportation is very high	.771
Our transportation cost is competitive in comparison with the market	.785
Our transportation service gives quick response to special requests	.775

Employee Performance	.793
Employee Negligence	.793
Inadequate Training	.784
Lack of understanding team work	.810
Lack of adequate and modern equipment	.784
Substandard Trucks	.796
Infrastructure Problem	.802
Missed Schedule	.790
Higher rate of loss and damage	.776
Excessive loading and unloading time	.776
high traffic jam in cities	.781

Our company transportation is efficient in moving materials and information	.863
Using transportation as a means of storage is a common practice in our company	.727
Our transportation deliver input at the right time	.704
Our transportation service deliver products to right place needed	.710
Our transportation service delver products to customers	.759

CHAPTER FOUR

Data Analysis, Results and Discussion

4.1. Introduction

This chapter presents the data analysis, the research findings (results), and based on the results the researcher gives discussion on the findings and also gives some interpretation of the result. In order to presents findings and the discussion about the role of transportation in logistics chain performance of East Africa Bottling Company; the researcher uses different form of tables and figures and qualitative analysis is done.

4.2. Response Rate

For data collection purpose, depending on sample of the study, a total of 108 questionnaires were distributed to respondents and 86 of them are collected but from the collected questionnaire 4 of them are not fit for analysis as a result of incompleteness the total questionnaire used for analysis is 82. Therefore the response rate stood at 76 percent which show the response rate is acceptable for analysis.

4.3. General Information

4.3.1 Respondents Gender

Table 4.1. Gender of Respondents

		Frequency	Percent
Valid	F	30	36.6
	M	52	63.4
	Total	82	100.0

Source survey 2016

The table above shows sex composition of respondents that participated in felling questionnaires. As per the result, from the total respondents, 52(63.4%) of them are Male while the remaining 30(36.6) are Female employee of the company. It shows the company has male employees

4.3.2. Educational Background of Respondents

Table 4.2. Educational Background of respondents

		Frequency	Percent
Valid	High school Complete	28	34.14
	Diploma	8	9.76
	Degree	35	42.68
	Masters	3	3.66
	Others	8	9.76
	Total	82	100.0

Source survey 2016

Table 4.2.2.Above shows educational background of respondents. From the total respondents, 28(34.14%), 8(9.76%), 35(42.68%) are High school complete, Diploma and Degree holders respectively while educational background of the remaining 3(3.66%) and 8(9.76%) are Masters and others respectively.

4.3.3 Work Experience of Respondents

Table 4.3. Work Experience

		Frequency	Percent
Valid	0-5 years	7	8.5
	6-10 years	20	24.4
	11-15 years	24	29.3
	above 15 years	31	37.8
	Total	82	100.0

Source survey 2016

Respondents of the questionnaire served the company for different period of time as per the result depicted in the table above. From the total respondents, 7(8.5%) of them are with the company for five years and below, 20(24.4%) fall in between six to ten years of service, 24(29.3%) are with the company for above eleven years to fifteen years and the remaining 31(28.8%) are in service of the company for above fifteen years. It is possible to state that majority of the respondents are with the company for a long period of time which means they know the company very well from which it is possible to get the required information for the study.

4.4. Descriptive Statistics for Transportation Practice and Factors Affecting Transportation Performance

4.4.1. Transportation Practice

Table 4.4. Transportation practice

	N	Mean	Std. Dev.
Transportation provides logistics efficiency	82	4.44	.704
Transportation systems timely delivery and safety satisfy customer	82	4.17	.717
The company reaches economies of scale and economies of distance to reduce cost	82	4.06	.616
Transportation service of our company is flexible	82	2.26	.991
Transportation service of our company is cost efficient	82	2.38	.951
The overall quality of our transportation is very high	82	2.40	.829
Our transportation cost is competitive in comparison with the market	82	4.28	.653
Our transportation service gives quick response to special requests	82	2.24	1.072
Valid N (list wise)	82		

Source survey 2016

In table 4.4, it is sought to see what transportation practice of the company looks like in order to do that , the respondents were requested to respond to the statements on a 5 point Likert scale and indicate the extent they agree with the statements that is: 5-Strongly agree, 4-Agree, 3-Nutral, 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 efficiency,

As per the response from respondents, the result shows that practices of the company like transportation provides logistics efficiency, transportation systems timely delivery and safety satisfy customer, the company reaches economies of scale and economies of distance to reduce cost, and our transportation cost is competitive in comparison with the market have a mean square value of 4.44, 4.17, 4.06 and 4.28 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 and safe delivery of product to the customer which is supported by 4.17 mean square value meaning respondents agree on the role of transportation in the company for timely delivery and safety. On the other hand, the companies practice of implementing economies of scale and economies of distance that is moving bulky products at a time and moving products long distance by consolidation is supported by respondents with a (mean value of 4.06, st dev.616) the other thing that respondents agree on is transportation cost of the company as they stated it is competitive in comparison with the market. (Mean 4.28, st.dev .653)

Transportation systems timely delivery and safety satisfy customer, the company reaches economies of scale and economies of distance to reduce cost, and our transportation cost is competitive in comparison with the market have a mean square value of 4.44, 4.17, 4.06 and 4.28 respectively showing that transportation is providing logistics efficiency by playing the roles of connecting, storage and creating time place and possession utility. Transportation increases customer satisfaction by timely and safe delivery of product to the customer which is supported by 4.17 mean square value meaning respondents agree on the role of transportation in the

company for timely delivery and safety. On the other hand, the companies practice of implementing economies of scale and economies of distance that is moving bulky products at a time and moving products long distance by consolidation is supported by respondents with a (mean value of 4.06, st dev.616) the other thing that respondents agree on is transportation cost of the company as they stated it is competitive in comparison with the market (Mean 4.28, st.dev .653)

Unlike the above four practices, transportation service flexibility, transportation service cost efficiency, the overall quality of transportation and transportation services quick response to special requests in the company with mean value of 2.26,2.38,2.4,and 2.24 respectively, the respondents disagreed with the practice of the company. It shows that transportation service lacks flexibility with mean and st.dev of (2.26 and .991), the transportation service is consuming much cost with mean of (2.38, .951) and the respondents also disagree with the existence of quality transportation service in the company with mean 2.4 and st dev .829 and also they disagree with the speed within which the company gives responses to special requests with mean and st.dev of 2.24 and 1.027.

The above finding shows that East Africa Bottling Share Company has to identifies areas of transportation practice like transportation flexibility, 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 efficiency resulting in improved organizational performance.

Table 4.5 Human factors affecting transportation Performance

Question items	Frequencies		Percent	Total	Mean	Std. Dev
1.Employee Performance	Very Low	-				
	Low	-				
	Moderate	16	19.5			
	High	47	57.3			
	Very High	29	23.2	100%	4.04	0.733
2. Employee Negligence	Very low					
	Low	12	14.6			
	Moderate	33	40.2			
	High	32	39.0			
	Very High	5	6.1	100%	3.94	0.743
3.Inadequate Training	Very low	-				
	Low	2	2.4			
	Moderate	18	22.0			
	High	50	61.0			
	Very High	12	14.6	100%	4.02	0.566
4. Lack of understanding Team Work	Very low	-				
	Low	1	1.2			
	Moderate	24	29.3			
	High	55	67.1			
	Very High	2	2.4	100%	4.06	0.673

Source Survey 2016

In table 4.4, it is sought to see the Human factors affecting transportation performance of the company, the respondents were requested to respond to the statements on a 5 point Likert scale and indicate 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 mean of above 4.51 is strongly agree. As per the response of respondents, all of the factors stated as human factors affecting transportation performance of the company are affecting the day to day operation of transportation in the company, employee performance with mean of (4.04) shows that employee performance in the company have a problem in order to benefit from excellent performance of the man power. Employee negligence with mean of (3.94) stated by respondents there exist negligence of some employees in the company which have an effect in the smooth operation of the transportation activity. The is also inadequate training with mean of (4.02) and Lack of understanding team work with mean of (4.06) is explained as the other human factor affecting transportation operation of the company.

Table 4.6 Non Human factors affecting transportation performance

Factors	Frequencies		Percent	Total	Mean	Std. Dev
1. Lack of adequate and modern equipment	Very Low					
	Low	5	6.1			
	Moderate	50	61.0			
	High	24	29.3			
	Very High	3	3.7	100%	3.84	0.853
2. Substandard Trucks	Very low	16	19.5			
	Low	20	24.4			
	Moderate	37	45.1			
	High	5	6.1			
	Very High	4	4.9	100%	3.79	0.813
3.Infrastructure problem	Very low					
	Low	20	24.4			
	Moderate	55	67.1			
	High	7	8.5			
	Very High			100%	3.98	0.867
4. Missed schedule	Very low					
	Low	2	2.4			
	Moderate	11	13.4			
	High	59	72.0			
	Very High	10	12.2	100%	4.1	0.713
5. Higher rate of loss and damage	Very low					
	Low					
	Moderate	31	37.8			
	High	45	54.9			
	Very High	6	7.3	100%	4.00	0.786
6. Excessive loading and unloading time	Very low					
	Low	4	4.9			
	Moderate	21	25.6			
	High	48	58.5			
	Very High	9	11.0	100%	3.88	0.792
7. Higher traffic jam in cities	Very low			100%	3.87	0.798

Source survey 2016

In table 4.6, it is meant to see the Non human factors affecting transportation operation of the company to do that , the respondents were requested to respond to the statements on a 5 point Likert scale and indicate the extent they agree with the statements that is: 5-Strongly agree, 4-Agree, 3-Nutral, 2-Disagree, 1-Strongly disagree. As it is depicted in the above table, the respondents agree on the existence of non human factors that affect transportation operation of the company with mean of (3.84) lack of adequate and modern equipment is stated as one of the

problem. There are also substandard trucks in the company as respondents agree with a mean of (3.79) there also exists an infrastructure problem in the company related with transportation as per respondents response having a mean of (3.98).There is also missed schedules with mean of (4.10.)

The existence of the non human factors stated above will hamper the smooth operation of transportation operation. Especially lack of availability of substandard trucks, lack of modern equipments and infrastructure problems significantly determine performance of the transportation service coupled with the human factors mentioned earlier as most of the operation of the East Africa Bottling Share Company is dependent on transportation.

4.7. Inferential Statistics for transportation Role and Logistics chain Performance

4.7.1. Correlation Analysis

To identify the relationship between role of transportation and logistics chain performance, correlation analysis is employed. The role transportation plays connecting, (storage and Creating time and place utility) is taken as the independent variable and logistics chain performance is considered as the dependent variable the indicators for logistics chain performance are logistics effectiveness, efficiency and differentiation.

Correlations are the measure of the linear relationship between two variables. A correlation coefficient has a value ranging from -1 to 1. Values that are closer to the absolute value of 1 indicate that there is a strong relationship between the variables being correlated whereas values closer to 0 indicates that there is little or no linear relationship.

As described by Andy (2006), the correlation is a commonly used measure of the size of an effect: values of ± 0.1represent a small effect, ± 0.3 is a medium effect and ± 0.5 is a large effect. In this section, correlation analysis conducted in the light of each research

Objectives and questions developed. The relationship between role of Transportation and Logistics chain performance was investigated using correlation analysis. This provides correlation Coefficients which indicate the strength and direction of relationship. The p-value also indicates the probability of this relationship‘s significance.

4.7.2. Correlation Analysis between Dimensions of Role of Transportation and Logistics chain performance indicators

To test relationship between the dependent variable-logistics performance with dimensions of Logistics performance indicators differentiation, Logistics efficiency and logistics effectiveness with the independent variable which is transportation efficiency in moving material and information, practice of using transportation as a storage facility, providing inputs timely, delivering products to customers timely, delivery accuracy in respect of place and timely delivery of products to customers. The finding of the analysis is clearly depicted below

Table 4.7 Correlation Analysis between Dimensions of role of transportation and Logistics chain performance indicators

		Efficiency in moving goods and information	Using transportation Storage role	Timely delivery of input me	Delivery to the right place	On time product delivery	Logistics Differentiation	Logistics Efficiency	Logistics Effectiveness
Efficiency in moving goods and information	Pearson Correlation	1	.385**	.217*	.173	.082	.165	.239*	.249*
	Sig. (2-tailed)		.000	.050	.120	.463	.139	.030	.024
	N	82	82	82	82	82	82	82	82
Storage role	Pearson Correlation	.385**	1	.639**	.568**	.457**	.704**	.764**	.780**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000	.000
	N	82	82	82	82	82	82	82	82
Timely delivery of input	Pearson Correlation	.217*	.639**	1	.754**	.591**	.814**	.801**	.887**
	Sig. (2-tailed)	.050	.000		.000	.000	.000	.000	.000
	N	82	82	82	82	82	82	82	82
Delivery to the right place	Pearson Correlation	.173	.568**	.754**	1	.658**	.785**	.606**	.889**
	Sig. (2-tailed)	.120	.000	.000		.000	.000	.000	.000
	N	82	82	82	82	82	82	82	82
On time product delivery	Pearson Correlation	.082	.457**	.591**	.658**	1	.780**	.550**	.810**
	Sig. (2-tailed)	.463	.000	.000	.000		.000	.000	.000
	N	82	82	82	82	82	82	82	82
Logistics Differentiation	Pearson Correlation	.165	.704**	.814**	.785**	.780**	1	.917**	.916**
	Sig. (2-tailed)	.139	.000	.000	.000	.000		.000	.000
	N	82	82	82	82	82	82	82	82
Logistics Efficiency	Pearson Correlation	.239*	.764**	.801**	.606**	.550**	.917**	1	.804**
	Sig. (2-tailed)	.030	.000	.000	.000	.000	.000		.000
	N	82	82	82	82	82	82	82	82
Logistics Effectiveness	Pearson Correlation	.249*	.780**	.887**	.889**	.810**	.916**	.804**	1
	Sig. (2-tailed)	.024	.000	.000	.000	.000	.000	.000	
	N	82	82	82	82	82	82	82	82

**. Correlation is significant at the 0.01 level (2-tailed).

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

The correlation between dimensions of transportation role and logistics chain performance indicators was run as seen in the above table. The result of correlation matrix between dimension and logistics chain performance are analyzed as follow:

As it is shown in the table 4.7 above, storage role of transportation is positively related to indicators of logistics chain performance of logistics differentiation with a Pearson correlation coefficient of 0.704 (r=0.704) and significance value is less than 0.001, logistics efficiency with a Pearson correlation coefficient of .764 and logistics chain effectiveness with a Pearson correlation coefficient of .780 and significance value of less than 0.001. This significance tells that there is strong relationship between storage role of transportation and logistics chain performance dimensions of logistics differentiation, efficiency and effectiveness.

It is also shown in the table above; the other role of transportation creating time utility is positively related with logistics chain performance dimensions of Logistics differentiation with Pearson coefficient of .814, with logistics efficiency with Pearson coefficient of .801 and with logistics effectiveness with Pearson coefficient of .887 with significance of less than .001 in all the three cases. This significance tells that there is a strong and genuine relationship between transportation role of creating time utility and logistics performance dimensions of differentiation, efficiency and effectiveness.

The other utility that transportation creates is place utility by delivering products to the right place. In this regard, transportation role of creating place utility is positively related with logistics chain performance dimensions of Differentiation, Efficiency and effectiveness with Pearson coefficient of .785, .550 and .810 respectively with significance level of less than.001 in all the three correlations.

4.7.3. Correlation analysis between Transportation practice and Logistics chain Performance

Table 4.8 correlation analysis between transportation practice and logistics chain performance

Correlations

		Transportation practice	Logistics performance
Transportation practice	Pearson Correlation	1	.465**
	Sig. (2-tailed)		.000
	N	82	82
Logistics performance	Pearson Correlation	.465**	1
	Sig. (2-tailed)	.000	
	N	82	82

**. Correlation is significant at the 0.01 level (2-tailed).

Source survey 2016

The correlation run test conducted in the above table to show correlation in between transportation practice and logistics chain performance shows significant but moderate relationship with Pearson coefficient of .465 and significance level of 0.00 which is less than 0.001.

4.7.4. Correlation between transportation role and logistics chain Performance

Table 4.9. Correlation between transportation role and Logistics chain performance

Correlation

		Transportation Role	Logistics performance
Transportation Role	Pearson Correlation	1	.925**
	Sig. (2-tailed)		.000
	N	82	82
Logistics performance	Pearson Correlation	.925**	1
	Sig. (2-tailed)	.000	
	N	82	82

**. Correlation is significant at the 0.01 level (2-tailed).

Source survey 2016

Table 4.9 shows the result of correlation run between transportation performance and logistics chain performance. As a result of the correlation run, there is a very strong positive relationship between transportation role and logistics chain performance with Pearson coefficient of correlation of .925 with significance of .000 which is less than .001

4.8. Regression Analysis

As it is stated in bold in the literature part of the paper, transportation plays a great role in the logistics chain and to have an efficient logistics performance, it is must to have a strong transportation service in the company. To prove this and determine the variation in logistics chain as a result of transportation, a regression analysis is conducted.

4.8.1. Regression analysis between role of transportation and logistics chain Performance

Table 4.10 model summary for dependent variable Logistics performance

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.925[a]	.855	.853	2.65385	1.849

a. *Predictors: (Constant), Transportation role*

b. Dependent Variable: Logistics chain Performance

Source survey 2016

From table 4.10 R-Square which is the coefficient of determination is a commonly used statistics to evaluate model fitness. The adjusted R square also called the coefficient of multiple determination, is the percentage of the variation in the dependent variable explained uniquely or jointly by the independent variable. As per the adjusted R square result in the table above, 85.3 percent of variation in Logistics chain performance of East Africa Bottling Share Company can be attributed to effect of predictor variable which is transportation role. This means, 14.7 percent changes in logistics chain performance can be attributed to other factors while 85.3 percent of the

variation in logistics chain performance is as a result of the role that transportation plays in the logistics chain.

4.8.2. Regression analysis between logistics chain performance and dimensions of Logistics chain performance

Table 4.11 Regression coefficients for logistics chain performance and for predictor variable

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.791	1.311		2.892	.005
	Logistics Differentiation	-.079	.148	-.036	-.538	.592
	Logistics Efficiency	1.406	.186	.342	7.575	.000
	Logistics Effectiveness	1.934	.120	.727	16.170	.000

a Dependent Variable: Logistics chain performance

Source SPSS output (2016)

Table 4.11 shows that there exists significant association between the independent variables Logistics efficiency and logistics effectiveness and the dependent variable logistics chain performance of east Africa bottling share company, since the p-value of those logistics chain performance dimensions are less than 0.05

Table 4.12 Model summary for dependent variable logistics chain performance for Predictor variable dimensions of logistics chain performance

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.988[a]	.976	.975	1.09331	1.790

a. Predictors: (Constant), Logistics Effectiveness, Logistics Efficiency, Logistics Differentiation

b. Dependent Variable: Logistics chain performance

Source survey 2016

The findings from table 4.12, the adjusted R Square, implies that 97.6 percent of the variation in Logistics chain Performance of the East Africa bottling company can be attributed to the combined effect of predictor variable(Logistics Effectiveness , Logistics Efficiency , Logistics Differentiation). That means 2.4 percent of changes in the logistics chain performance is attributed to other factors.

4.8.3 Regression analysis between Transportation practice and Role of Transportation

Table 4.13 Regression coefficient for role of transportation

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	8.817	2.142		4.117	.000
	Transportation practice	.370	.070	.507	5.267	.000

a. Dependent Variable: Role of Transportation

Source survey 2016

Table 4.13 shows there exists significant association between the transportation role and the transportation practice of East Africa bottling company; since p-value for transportation practice is less than 0.05. It is to mean that by taking all other factors at constant zero, a unit increase in transportation practice results in a 37 percent increase in role that transportation plays in the logistics chain.

Table 4.14 Model summary for dependent variable role of transportation

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.507[a]	.257	.248	2.54899	1.737

a. Predictors: (Constant), Transportation practice

b. Dependent Variable: Role of transportation

Source Survey 2016

The adjusted R Square in table 4.14 shows that 24.8 percent of the variations in role of transportation is as a result of the predictor transportation practice and the remaining 75.2 percent is as a result of some other factors.

Table 4.15 Regression coefficient for role of transportation of East Africa bottling Share Company

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	31.154	5.184		6.010	.000
	Transportation practice	.800	.170	.465	4.702	.000

a. Dependent Variable: Logistics Performance

Source Survey 2016

The result in table 4.15 shows that there is significant association between the independent variable transportation practice and logistics chain performance as p-value for transportation practice is less than 0.05.

Table 4.16 model summary for transportation practice

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.465[a]	.217	.207	6.16883	1.561

a. Predictors: (Constant), Transportation practice

b. Dependent Variable: Logistics chain performance

Source Survey 2016

The adjusted R Square I table 4.16 shows that 20.7% of variation in logistics performance is related with the Transportation practice with the remaining of 79.30% resulting from other factors.

4.9. Discussion of Results

The objective of the study is to examine the role of transportation in logistics chain performance with specific objectives of analyzing transportation practice and identifying transportation related problems specific to East Africa bottling share Company. Literature has suggested that logistics chain performance is dependent up on transpiration service at each and every stage of operation. The study will contribute by exploring the relationship between transportation role and logistics chain while showing factors affecting smooth operation of transportation at the same time. In order to do that, the results are discussed here below.

Transportation practice of the company is analyzed using descriptive statistics. The findings reveal that transportation provides logistics efficiency with a mean of 4.44 (St Dev .704). This

shows that transportation operation of the company is providing logistics efficiency even though there are factors affecting the smooth operation which will be discussed in the later part of the discussion. Safety and timely delivery of products increases customer satisfaction as it is supported by respondents with mean of 4.17 St Dev 0.717.The company is also using economies of scale and distance in order to benefit from reduced cost of transportation as literatures stats that almost one third to two third of logistics cost is transport related.

On the other end, flexibility of transport operation in East Africa Bottling share company is not supported by majority of respondents with mean of 2.26 St.Dev.991 his shows that transportation practice lacks flexibility. Even if economies of scale and distance is explained as practice of the company, still respondents disagree with cost efficiency of the transportation operation with mean and St. Dev of 2.38 and .951.quality of transportation service and the speed of reply to special enquiry is not the practice in the company with mean of 2.4 and 2.224 respectively showing that quality is compromised. Quality of transportation is in question means the whole operation of logistics chain is at risk as the whole operation of logistics starting from raw material delivery to distribution of finished goods to the market is dependent on transportation.

The factors that affect transportation are divided in to two as human and non human factors. From the non human factors that are affecting transportation operation of the company are employee performance, employee negligence, inadequate training and lack of understanding team work are described as existing problem in the company

Transportation is also being affected by non human factors of lack of adequate and modern equipment, substandard trucks, loss and damage, missed schedule, infrastructure problem and excessive loading and unloading time, high traffic jam in cities like Addis Ababa are among the non human factors that affect transportation in the company.

Correlation result between transportation role and dimensions of logistics chain performance is conducted in order to see the degree of association between the constructs. As per the result there is a significant association in between storage role of transportation and all the three dimensions of logistics chain performance of differentiation with Pearson coefficient of.704, with logistics efficiency having .746 Pearson coefficients and with coefficient of .780 with logistics effectiveness.

Transportation role of creating place and time utility also have a strong association with differentiation, efficiency and effectiveness with Pearson coefficient of .814, .801 and .887 for time utility and .785, .550 and .810 for place utility respectively

There is a moderate but significant association between transportation practice and logistics chain performance of East Africa Bottling Share Company which also supports the literature that a good transportation service reduces uncertainty and level of inventory holding. The two factors transportation practice and logistics chain performance have Pearson coefficient of .465 and significance level of below 0.001.

Dimensions of logistics chain performance (Logistics differentiation, Logistics efficiency and Logistics effectiveness) determines 97.5% of the variation in logistics chain performance which indicates working on those dimensions of logistics chain performance dimensions is at the heart of every logistician.

Transportation practice effect on Transportation role is also regressed in order to see what percentage of transportation role is in the control of transportation practice as a result with R Square of .248, variation in Transportation role is attributed to 24.8% of transportation practice.

As the ultimate objective of the paper is examining and bringing to the attention of the company as well as all stakeholders, the association between role of transportation and logistics chain performance is very strong with Pearson coefficient of .925 and significance level of .000.

4.10. Summary of Interview

As per the interview conducted, with different employees of the company in the logistics department, the role that transportation plays is inevitable. Almost every activity is dependent on logistics operation. Even if the positive contribution of transportation is supported by them, there are problems related with transportation that hinders the smooth operation. Some of the problems are related with the human factors like employee performance, negligence and the like but the main problems raise are infrastructure problems and the traffic jam in the cities are the main ones. Even if there are problems the contribution of transportation is rated as the core activity in the logistics chain of the company which is supported by the finding of the paper.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.1. Conclusions

Based on the result of summary findings,

- There are human factors employee negligence, employee performance, inadequate training and lack of understanding team work
- Transportation service of East Africa Bottling Share Company is providing logistics efficiency despite the problems of human and non human
- The company is using economies of scale and distance in order to reduce transportation cost that leads to reduced logistics cost.
- Transportation of the company is not flexible as supported by majority of respondents which shows lack of flexibility in transportation operation of East Africa Bottling share Company.
- The transportation practice is also not cost efficient as per respondents‘ response.
- The transportation service is also not giving timely reply to special enquiry from customers.
- The non human that are hindering the smooth operation of transportation from playing the intended role includes; substandard trucks, infrastructure problems, missed schedule, higher rate of loss and damage and excessive loading and unloading time are the main ones.
- There is a strong and positive relationship between transportation practice and role of transportation with logistics chain performance.

- The relationship between transportation (the role transportation plays) and logistics chain performance is very strong and positive. It shows that role of transportation have a strong influence on logistics chain performance.

5.2. Recommendations

Based on the overall findings and conclusions made, the under listed recommendations are made.

- To improve transportation performance and enhance its role on logistics chain performance, the company needs to look in to human factors like employee performance, negligence, inadequate training and lack of understanding teamwork.
- The company also needs to avoid or keep to a minimum the non human factors that are hindering the smooth operation of transportation.
- The company has to work on transportation flexibility in order to serve different segment of the market.
- Transportation cost has to be controlled in order to reduce logistics chain cost as transportation cost accounts for one third to two third of logistics cost.
- To cultivate the benefits of logistics chain performance, the company has to give due emphasis to transportation practice as transportation accounts for about one third to two third of logistics costs which will support the company‘s objective of benefiting from economies of scale.
- To increase organizational performance, it is better for the organization to give due attention to logistics chain performance as more and more of their operation is dependent on transportation.

5.3 Implication for further study

It should be noted that transportation is not the only factor that influence logistics chain performance but there are chain activities like procurement, warehousing,, distribution and also the relation of logistics with other operation of the company like marketing, production, finance and the like all have a say on the performance of logistics operation even if the major one is transportation. Performance of logistics chain is not dependent only on transportation. Therefore, the implication for further study is to include all other dimensions including the influence from other departments in the company in order to have a full picture of factors having significant role on performance of logistics chain.

In order to be more accurate of transportation role, it will also be an interest to conduct the study on different companies at a time especially in breweries industry as their operation is largely transportation dependent.

References

Atefeh Yazdanparast Ila Manuj Stephen M. Swartz. (2010),"Co-creating logistics value: a service-dominant logic perspective", The International Journal of Logistics Management, Vol. 21 Iss 3 pp. 375 – 403

Bryman, A., and Bell, E. (2007), *Business research methods* (2nd ed). Oxford:Oxford University press.

Garland Chow Trevor D. Heaver Lennart E. Henriksson. (1994),"Logistics Performance", International Journal of Physical Distribution & Logistics Management, Vol. 24 Iss 1 pp. 17 – 28

Jörn Schönberger Herbert Kopfer. (2009),"Transport system responsiveness improvement", International Journal of Physical Distribution & Logistics Management, Vol. 39 Iss 1 pp. 63 – 79

Joel D. Wisner. (1999),"A study of successful quality improvement programs in the transportation industry",Benchmarking: An International Journal, Vol. 6 Iss 2 pp. 147 – 163

John J. Coyle, Robert A. Novack, Brian J.Gibson and Edward J. Bardi. (2011), Transportation: A Supply Chain Perspective, Seventh edition

James H.Bookbider and Tiffany A.Motuk. (2009), logistics and transportation in global supply chain: review,Critique and Prospects.department of management science , university of Waterloo

Karel van Donselaar Kees Kokke Martijn Allessie. (1998),"Performance measurement in the transportation and distribution sector", International Journal of Physical Distribution & Logistics Management, Vol. 28 Iss 6 pp. 434 – 450

Kenneth W. Green Jr Dwayne Whitten R. Anthony Inman. (2008),"The impact of logistics performance on organizational performance in a supply chain context", Supply Chain Management: An International Journal, Vol. 13 Iss 4 pp. 317 – 327

Kenneth W. Green Jr Dwayne Whitten R. Anthony Inman, (2008),"The impact of logistics performance on organizational performance in a supply chain context", Supply Chain Management: An International Journal, Vol. 13 Iss 4 pp. 317 – 327

Lata Chatterjee Chiung-min Tsai. (2011), Transportation logistics in global value and supply chain ,Center for Transportation Studies Boston University

MatiwosEnsermu. (2015), Logistics and supply chain Management, published by BSPE, Addis Ababa

Michael Tracey. (2004),"Transportation Effectiveness and Manufacturing Firm Performance", The International Journal of Logistics Management, Vol. 15 Iss 2 pp. 31 – 50

Nelson, J., Ishikawa, E & Geaneotes, A. (2009), ―Developing Inclusive Business Models: A Review of Coca-Cola's Manual Distribution Centers in Ethiopia and Tanzania." *(A report by the Harvard Kennedy School and the International Finance Corporation, 2009.)*

Patrick Fung Alfred Wong. (1998),"Case study: managing for total quality of logistics services in the supply chain", Logistics Information Management, Vol. 11 Iss 5 pp. 324 – 329

Patricia J. Daugherty Alexander E. Ellinger Craig M. Gustin. (1996),"Integrated logistics: achieving logistics performance improvements", Supply Chain Management: An International Journal, Vol. 1 Iss 3 pp. 25 - 33

Sreenivas.M and Srinivas .T. (2001), The role of transportation in logistics chain: Alluri institute of management science

Shlomo Globerson, Gal Wolbrum. (2014), Logistics Management and Supply Chain Management: A Critical Evaluation. International Journal of Business and Economics Research. Vol. 3, No. 2,

Tracy. (2004), Transportation effectiveness and Manufacturing firm performance: The International Journal of Logistics Management, Vol. 15

Wai Peng Wong Keng Lin Soh Chu Le Chong Noorliza Karia.(2015),"Logistics firms performance: efficiency and effectiveness perspectives", International Journal of Productivity and Performance Management, Vol. 64 Iss 5 pp. 686 - 701

Yamane, Taro. (1967), Statistics: An Introductory Analysis, 2nd Edition. New York: Harper and Row.

Appendix

Dear all Subject:

This questionnaire is prepared to collect data from the respondents in order to assess the role of transportation in logistics chain performance in the **East Africa bottling Share Company**. I am a student of Addis Ababa University School of Commerce in Department of Logistics and Supply Chain Management. First of all I would like to forward my heartfelt gratitude and respect to you for administering this questionnaire honestly and responsibly. The questionnaire is designed to collect the necessary information to undertake a research on the topic **"The Role of Transportation in Logistics chain performance in the case of east Africa Bottling share Company** for the partial fulfillment of the requirement of the degree of Masters of Logistics and Supply Chain Management. The information that you provide will remain confidential and will be used for the purpose of this research only. For any further enquiry please use the address below

Email: worknehsamuel@yahoo.com or mobile phone 0912199896

Thank you in advance for your cooperation

Questionnaire

Please give answers in the spaces provided and tick in the box that matches your response to the questions where applicable.

Part One-Respondents profile

1. Sex Male---------- Female----------

2. Educational Background: - Diploma------ Degree --- Masters ----other please specify-----

3. Years of experience in the company: 1-5 ____, 6-10 ____, 11-15 ___, ≥15 ____

Part two – Questions related to Transportation practice

1. Practice or system of transportation provides efficiency in logistics.

Strongly agree □ Agree □ neither agree nor disagree □ Disagree □ strongly disagree □

2. Transportation systems timely delivery and safety satisfy your customer

   Strongly agree □Agree□ neither agree nor disagree□ Disagree □ strongly disagree□

3. The company reach economies of scale and economies of distance to reduce cost

   Strongly agree□ Agree □ neither agree nor disagree □Disagree □strongly disagree□

4. Transpiration service of our company is flexible

   Strongly agree□ Agree □ neither agree nor disagree □Disagree □strongly disagree□

5. Our transportation service is cost efficient

   Strongly agree□ Agree □ neither agree nor disagree □Disagree □strongly disagree□

6. The overall quality of our transportation is very high

   Strongly agree□ Agree □ neither agree nor disagree □Disagree □strongly disagree□

7. Our transportation cost is competitive in comparison with the market.

   Strongly agree□ Agree □ neither agree nor disagree □Disagree □strongly disagree□

8. Our transpiration service gives quick response to special requests

   Strongly agree□ Agree □ neither agree nor disagree □ Disagree □strongly disagree□

Part three – Questions related to Transportation practice Challenges

I. Human factor challenges affecting transportation practice

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				
	Very low	Low	Moderate	High	Very High
	1	2	3	4	5
Employee performance					
Employee negligence					
Inadequate training					
Lack of understanding team work					

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

Part four – Questions related to Transportation Role

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

Transportation Role	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					
2.Storage					
Using transportation as a means of storage is a common practice in your company					
3.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 backorder					
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
Number of order shipped on time					
Percent of shipment requiring expediting					
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
	1	2	3	4	5
Sales in Birr					
Transportation cost					
Warehousing cost					
Inventory cost					