ADDIS ABABA UNIVERSITY SCHOOL OF COMMERCE LOGISTICS AND SUPPLY CHAIN MANAGEMENT UNIT

FOOD SUPLLY CHAIN MANGEMENT PRACTICE AND FACTORS AFFECTING ITS PERFORMANCE: THE CASE OF WHOLESALERS AND RETAILERS ADDIS ABABA

BY

SHIMELIS HAYILEMEKEL
(ID.No. GSE/2441/12)

A THESIS SUBMITTED TO ADDIS ABABA UNIVERSITY, SCHOOL OF COMMERCE FOR PARCIALFULFILMENT OF DEGREE OF MASTERS OF ART IN LOGISTICS AND SUPPLY CHAIN MANAGEMENT.

Advisor: Shiferaw Mitku (Ph.D)

June, 2022
Addis Ababa, Ethiopia

Addis Ababa University
School of Commerce
Department of Logistics and Supply Chain Management

FOOD SUPLLY CHAIN MANGEMENT PRACTICE AND FACTORS AFFECTING ITS PERFORMANCE: THE CASE OF WHOLESALERS AND RETAILERS ADDIS ABABA.

By SHIMELIS HAYILEMEKEL

Approved by Board of Examiners

Advisor	**----------**	**----------**
Shiferaw Mitku (Ph.D)	**Signature**	**Date**
Internal Examiner	**----------**	**----------**
Tariku Jebena (Ph.D)	**Signature**	**Date**
External Examiner	**----------**	**----------**
Delessa Dhaba (Ph.D)	**Signature**	**Date**

ENDORSMENT

I certify that this thesis entitled “FOOD SUPPLY CHAIN MANAGEMENT PARACTICE AND FACTORS AFFECTING ITS PERFORMANCE: the case of wholesalers and retailers in Addis Ababa” is Mr. Shimelis Hayilemeskel Owen work and carried out research under my supervision. This thesis has been submitted to Addis Ababa University School of Commerce for examination with my approval as university advisor.

Shiferaw Mitku (Ph.D)

Signiture_____

Date _____

Table of Contents

Table of Contents

List of Abbreviation

CSA: Central Statistics Agency

FAO: Food and Agricultural Organization

SC: Supply Chain

SCM: Supply Chain Management

SCORM: Supply Chain Operation Reference Model

CSCMP: Council of Supply Chain Management Professionals

TCE: Total Cost of economy

List of Tables

List of Figures

ABSTRACT

Food supply chain; which has an economic and political significance for all countries is become increasingly complex and geographically decoupled in production and consumption activities. With high urbanization and poor productivity ensuring food security especially in the city is a real challenge for developing countries. 21.7 % of the population in Ethiopia is living in cities and Addis Ababa city dweller is estimated 5.2 million with 4.44% growth rate according to the World Bank 2022 reports. It is very challenging to feed most populous city of the country with fragmented, traditional and manipulated supply network. Access to food through wholesale and retail supply chain distribution is very significant for the urban population. A major challenge in supply chain management is the coordination of the different activities taking place between all the involved participants. Understanding the interdependencies and the complexity of these activities in a supply chain is elementary to actually managing it (Holmberg, 2000). Considering the philosophy "What you cannot measure, you cannot manage", measuring the supply chain performance becomes tremendously important for companies and their supply chains in order stay competitive. So far only a small number of performance measurement systems exist that can help to understand and improve a supply chain's overall performance. ***Purpose:*** *The purpose of this master thesis is therefore to analyze supply chain performance measurement systems and identify problems and challenges when measuring the performance of a supply chain.* ***Research Method:*** *Since this thesis aims at finding problems and challenges which highly differ and depend on individual companies, a qualitative approach has been chosen because of the variety of expected results. In most cases, qualitative research is based on different kinds of data collection methods (Patton, 2002), questionnaires have been used in this thesis.* ***Conclusion:*** *The found theoretical and practical problems and challenges were combined and a final list of challenges for supply chain performance measurement was developed. The developed list included the following six challenges: Unfavorable Supply Chain Operating Rule, lack of Supply Chain Assets, poor Supply Chain Resources, and unclear Supply chain Network, monotonous Regulation and lack of Information Technology support. This thesis therefore offers the basis of further research by providing a list of challenges which need to be considered to successfully measure supply chain performance.*

Key words: Food Supply Chain, enablers, challenges, performance.

CHAPTER ONE

INTRODUCTION

This chapter presents background of the study, background, problem statement, research question, general and specific objectives, significance, scope, limitation and organization of the study.

1.1 Background of the Study

Food supply chains are the lifeline for human existence on the planet. Whether these chains are local or international, the availability of food at the right time, right quality and right quantity is paramount (Samir Dani, 2016). Food Supply Chain is different from other supply chains which can be described by factors like food quality, safety, and freshness within limited time. These characteristics of food supply chain make it food supply chain more complex and difficult to manage (La Scalia *et al.,* 2016). In the food supply chain resources like trucks, warehouse facilities, transportation routes, and workers within the food supply chain should be efficient so as to ensure the food quality and safety (Wu, Liao, Tseng and Chiu, 2016).

Food supply Chain in developing countries changing rapidly due to several factors; these includes population and income growth, urbanization, and the expansion, globally and domestically, of modern food retailing, distribution, and wholesaling firms (FAO 2010). As importance of cities is rapidly growing, many more people do not grow their own food and rely on market purchases for their food needs. This results in rapidly increasing agricultural market flows, especially from rural to urban areas, with a high number of people on the production and consumption side depending on the functioning of these value chains. This dynamic has profound implications on people's food security in developing countries.

Africa's urban population is also rapidly increasing. The urbanization rate is projected to be as high as 60 percent by 2050 (UN Population Division 2010), and there are growing concerns by local policy makers about the increasing dependence of people in African cities on imported foods. Ethiopia is one of African countries that its urban population is increasing rapidly and its economy is highly dependent on agricultural sector that practice fragmented and traditional supply chain. According to (Balda and Singh, 2020) the supply chain practice in most Ethiopian manufacturing industries including food is traditional. In Ethiopia the main producer of food are smallholder farmers which characterized by scattered that have many layers of supply chain with many actors. It is characterized by non-collaborative relationship with suppliers and customers in terms of aligning strategies and operations.

United Nations - World Population Prospects Addis Ababa's, the capital and the biggest city of Ethiopia with 5million people living in. In addition, many people are coming and working in Addis in daily basis

and back to the surrounding Oromia region. Therefore, Ethiopia's food supply and price is mainly determined by Addis Ababa supply chain. And hence, this paper will assess factors that influence the food supply chain management; practice and evaluate Addis Ababa's food supply chain performance.

1.2 Statement of the Problem

Ethiopia covers approximately 1.2 million square kilometers. Currently in 2022 Ethiopia's population is estimated to around 120.8 million inhabitants, with average population growth rate of 2.4% according to United Nation population dashboard. This rapid population growth sets high demands to Ethiopia's food production system and on its natural resources. With an economy based largely on rain fed agriculture in combination with widespread poverty, sparsely available health services, inadequate road infrastructure, and weak institutions, the welfare of the Ethiopian population is highly exposed to the problem of food supply chain (World Bank, 2021).

Ethiopian agriculture mostly comprises subsistence farming, dominated by smallholder farmers engaged in a variety of mixed farming activities. According to the Ethiopian national statistics agency Ethiopia has about fifty types of foods and/or commercial crops and nine types of economic live animals (CSA, 2016). The economic crops in Ethiopia are further classified as cereals, pulses, oilseeds, vegetables, roots and tubers, fruit, stimulants and sugar cane(CSA, 2015), indicate that national crop production is dominated by cereals, in terms of both cultivated land acreage and volume of production .

Despite the above fact Ethiopia's agriculture sector remains unable to meet local food demands and therefore the country is still dependent on imported food commodities. This is because besides low productivity, the agricultural supply chains and services across food chains in the Ethiopian agriculture sector are characterized by various problems.

According to recent studies showed that the main constraints in the food and agriculture sector in Ethiopia are inadequate and inappropriate partnership in the food chains; underdeveloped and fragmented logistics management systems; poor or no transport or logistics infrastructure (roads, warehouses, cold chains, *etc*.);poor information management systems; inadequate financing system; lack of coordination of food transport; high losses resulting from damage to goods and quality deterioration due to inappropriate harvesting, storage, packaging and transport.

Effective supply chain management (SCM) has become a potentially valuable way of securing competitive advantage and improving organizational performance since competition is no longer between organizations, but among supply chains (Wook Kim, S.., 2006). The style of retail environments, the technology advancements in tracking, operations management and packaging have made it possible to import a food item from any part of the world at the right quality specifications. This

is not an easy task and it needs a lot of effort to create capability within the system to manage international trade specifically within the food sector. There are many efforts from different angle; from policy maker to business people to enhance the food supply chain of Addis Ababa.

Addis Ababa is perceived as the city of opportunity by the citizens and hence Addis is overwhelming by internal migrants seeking better life. Beside the city dwellers are living in slumps and suburbs many are visiting Addis Ababa in daily basis to work and back to their home to the neighborhood of Oromia surrounding Addis.

Therefore, securing the food supply for Addis Ababa; the capital city of Africa, home for many international offices and diplomats and with above 5 million dwellers is the biggest challenge for the policy makers and the supply chain specialist. The sector is characterized by unintegrated and fragmented actors which expose the supply chain to be very much manipulated by fake information and with unfair price share distribution across the chain. The consumers are therefore, abused with high price fluctuation (inflated) and artificial supply shortage. Hence, this paper will assess factors that influence the food supply chain and oversee the practice and examine the Challenge of food supply chain and evaluate the performance of food supply chain in terms of wholesalers and retailers.

1.3 Research Questions

Based on the statement problem this research will address the following questions:

- How food supply chain management is being practiced in Addis Ababa?
- What are challenges affecting the food supply chain performance?
- What are enablers of food supply chain performance?
- What are food supplies chains challenges affecting the performance in Addis Ababa?

1.4 Objectives of the Study

1.4.1 General Objective

The general objective of the study is to assess the food supply chain management practices and factors affecting its performance.

1.4.2 Specific objectives

In order to achieve the general objective of the study this research will have the following specific objectives:

- To assess the food supply chain management practices

- To describe enablers of food supply chain management
- To identify challenges affecting the food supply chain performance
- To measure the food supply chain performance in terms of (efficiency, flexibility, quality & safety and integration).

1.5 Significance of the study

Supply chain is key strategic area requiring significant attention and effective management. It is one of the most expensive activity and improving or optimizing the supply chain will have significant impact on company's performance in terms of profitability and customer satisfaction. Because, effective supply chain will help a lot in delivering the right product/service, in the right quantity, to the right place, at the right time, with the right quality, and with the right cost.

In this regard, the paper will help the academics as a reference and medium of learning. In addition it helps scholars to their study and advancement of knowledge. Through this study, they will be able to improve their knowledge under factors affecting food supply chain, practice and challenges. By identifying the factors affecting the food supply chain and introducing transparent and integrated supply chain the paper will help the practitioner's in easing and facilitating the sector by identifying the enablers and the challenges of food supply chain and reduce costs and save time. The paper will also identify the factors and the current supply chain practices, strategies, challenges, and bottlenecks of the food supply chain and will benefit actors across the chain. The finding of the paper will also help policy makers by providing baseline information to transform the food supply chain by suggesting to producing skilled manpower and making the policy conducive and facilitative environment.

1.6 Scope of the study

The scope of the study explains the extent to which the research area will be explored in the work and specifies the parameters within the study will be operating.

Food Supply chain includes not only the processor and the suppliers but also the transporters, warehouse providers, retailers, and even the customers themselves (Chopra and Meindl, 2008). As no study is completely inclusive of all possible aspects, the scope of this paper is also limited to: wholesalers and retailers of food and not include other food supply chain elements and actors, like transporters, Brokers and producers/Farmers are not included in the study. Secondly, many of wholesalers and retailers are engaged in Addis Ababa's staple food and not include liquid foods, vegetables, fruits and ingredients are not included in the study. Due to time constraints the research focuses on wholesalers and retailers of food items.

Geographically, the study is delimited only in Addis Ababa which makes difficult to apply the findings on other cities of Ethiopia. In addition the study is a onetime study.

1.7 Limitation of the study

There was a time constraint not to include other actors in the supply chain. Accessing respondents through digital means to ease distribution and collection of questionnaires was very challenging. The study would include educational level of the respondents in the demographic profile of the study as the conclusion and recommendation is drawn from the respondent's point of view, however much attention is given to accuracy and reliability of data.

1.8 Definition of terms

Supply chain:"a sequence of decision making and execution processes and material, information, and money flows that aim to meet final customer requirements that takes place between different stages along the continuum, from point of production to final consumption." (Aramyan *et al*, 2007)

Supply Chain Management: "The planning and management of all activities involved in sourcing and procurement, conversion and all logistics management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third-party service providers and customers." The Council of Supply Chain Management Professionals (CSCMP, 2022)

The supply chain integration: work on principles of collaboration, shared decision making, open communication, shared vision, shared technology and high level of trust between the producer and their customers. (Flynn *et al.,* 2014).

Supplier-is participants in supply chain that act as the link between producers, processors andmarkets. The distributors source either fresh produce or processed food from the processors and then distribute it through various channels to reach the final consumer. (Smithers, R, 2014)

Customers-The consumer is the final entity in the food supply chain. The economic sustainability of the chain depends upon the consumers buying the products and providing the necessary cash to travel upstream through the supply chain. (Smithers, R, 2014)

Information technology (IT)- As a supply chain spans many organizations in developing products to customers both up-stream, downstream and many functional areas within a company, the implementation of IT allows the companies to increase communication and coordination of various

value adding activities with their partners and between functions within their own operation (Simchi-levi *et al,* 2008).

Supply Chain mapping: is an exercise in which companies' collects information on supplier and sub-supplier to increase traceability and transparency of the entire supply chain. Fair Labor Association (FLA), 2016)

The bullwhip effect (also known as the Forrester effect): is defined as the demand distortion that travels upstream in the supply chain from the retailer through to the wholesaler and manufacturer due to the variance of orders which may be larger than that of sales. (The Chartered Institute of Procurement & Supply (CIPS), 2014)

1.9 Organization of the study

The research is divided into five chapters. The first chapter contains introduction of the study, which consists of background of the study, background of the organization, problem statement, and objective of the study, research question, and significance of the study, scope, limitations and organization of the study. The second chapter deals with the theoretical and empirical literatures. The third chapter deals with the research methodology to be used in the study together with ethical consideration. In the fourth chapter, the researcher tries to present result and data analysis and interpretation. The final chapter will concentrate on summary, conclusion and recommendation on the overall study based on the analysis of collected data.

CHAPTER TWO

Related Literature Review

2.1 Theoretical Review

2.1.1 Concepts of Supply Chain

Supply chain governance: refers to the institutional framework in the supply chain where transactions are negotiated and executed. Food chains governance is important in supply chain performance; it includes concepts in transaction cost economics such as transaction-specific investments, bounded rationality, opportunism and information asymmetry and Transaction specific investment. (Zhang and Aramyan, 2009).

The bullwhip effect (also known as the Forrester effect) is defined as the demand distortion that travels upstream in the supply chain from the retailer through to the wholesaler and manufacturer due to the variance of orders which may be larger than that of sales can lead to excessive inventory investments throughout the supply chain when the parties involved attempt to protect themselves against demand variations. It can also lead to an accumulation of inventory at the manufacturer's end that will further increase supply chain costs. (The Chartered Institute of Procurement & Supply (CIPS, 2014)

Linkage: Linkages between major institutional actors in agricultural knowledge and information system are widely recognized as essential for an effective flow of technology and information between research, extension and farmers. The types and nature of linkage between actors within the agricultural knowledge and information system directly influence the production and productivity of small holder farmers and indirectly influence the supply chain and the consumer. (The 3rd International Conference on Agricultural and Life Sciences (ICALS0, 2019)

Knowledge: In purely commercial relationship, knowledge is transferred between companies that participate in the project through intermediaries. Whereas, in order to have a successful alliance, the relationships are transformed through investments in particular assets, recombination of capacities and routines, distinctive developments of know-how, establishing common experiences and practices and developing a new common language, that facilitates cooperation.

Whereas, Knowledge management (KM) has a great applicability in the agri-food supply chain (ASC). Knowledge that rural and farming communities are typically interested in includes cultural management practices; new agricultural technologies; diagnostic information about plant and animal disease and soil related problems; market information on inputs and sales(prices, seller, buyers, retailers); market

demand and quality of products required for these markets; and land records and government policies. And hence the knowledge that the farmers acquire influence the productivity and market access of the produce. (Bernd Scholz-Reiter, 2008)

2.1.2 Enablers of supply chain practice

The food supply chain industry is a very complex environment influenced by numerous industrial, technological, economic, social and political factors. The availability of food, the types of products offered as well as the ways of delivering food to consumers depend on them. (UrszulaZiemiańczyk, Anna Krakowiak-Bal, 2018)

The complexities in the food supply chain are derived from within a number of areas; agriculture production, involvement of various governmental/non-governmental actors, processing and maintaining quality, consumer and market choices, local authorities, logistics companies; and a host of other small companies actively involved in this food supply chain and providing secondary value. The supply chain of agricultural products has become an important issue due to the fact that the public is increasingly aware of and concerned about the availability and safety of the food being consumed (Handayati *et al.* 2015).

Technological innovations, new business models, globalization and the movement of people have made food supply chains rethink fulfillment and effectiveness parameters. Innovations in processing and transport have made products more suitable for global distribution, and innovations in management and information and communication technologies (ICT) have allowed supply chains to become more responsive to the increasingly sophisticated food demands of consumers. Those are most important factors of food supply chain performance. However due to the volume of this study, this paper will focus on factors discussed in Samir Dani's 2016 book that includes:

i. Consideration as value chains

Food supply chains should be viewed as 'value chain systems' in which the raw material (from an agro-based source) is transformed for final consumption as it moves through the chain and increases in value. Considering the food supply chain as a value chain also means that entities along the chain can aspire to move up the value chain, thereby increasing their share of the return. The food value chain is the network of stakeholders involved in growing, processing and selling the food that consumers eat – from farm to table. (Samir Dani, 2016).

This paper will assess whether or not the supply chain is considered as a value chain in the case of Addis Ababa food wholesalers and retailers.

ii. Legislations

The movement of food across international borders is subject to an agreement on the application of the Sanitary and Python sanitary Measures (SPS Agreement) of the World Trade Organization (WTO). Other international standards will focus on varied topics related to food hygiene, labelling requirements and so on. These agreements and laws create a greater transparency when dealing in international trade. (Samir Dani, 2016).

Ethiopian Food and Drug Authority (EFDA) is authorized for regulating and controlling the safety, effectiveness and quality and proper utilization of food and drugs in order to protect and improve the health society. Accordingly the authority through general food regulation, established controlling mechanisms to identify by whom and to whom a product has been supplied. Food labeling, inspection and market checkup is a key focus within food regulation.

iii. Consumer choice

Global food consumption patterns have shown two diverse scenarios. The developed world has seen an increased propensity towards consuming processed food, led by demand from a time-starved working population. The preference for ready-to-eat or microwaveable food products has led to innovations within the retail and packaging environments to service this demand. However, this produces a strange phenomenon in which fresh fruits and vegetables are more expensive than value-added processed food. One of the reasons for this is the economies of scale that the food industry achieves when processing food for the retail environment. Samir Dani (2016)

Consumers of Addis Ababa moving from a cereal, grain-based diet to a protein- and meat based diet and out of home/hotel food consumption is increased. The paper will evaluate if this consumer trend has significant influence on the supply chain.

iv. Sustainability

The global food chain is a significant contributor to global greenhouse gas (GHG) emissions. GHGs are produced at all stages in the chain, from food production (and its inputs) through food processing, food distribution and consumption to the disposal of waste. Sustainability within the food supply chain must be considered on a number of fronts. These include; Energy consumption, Carbon emissions, Water usage, Food availability, Ethical behavior and Economic sustainability. (Samir Dani, 2016)

v. Collaboration

Collaboration among the various stakeholders along the food value chain is extremely important. Collaboration between the entities in the chain provides the entities with confidence in the sourcing, handling and quality control of food. Collaborative platforms help supply chain partners to have an end-to-end view of the chain. (Samir Dani, 2016). How the actors across the Addis Ababa food supply chain collaborates will be examined in this paper.

2.1.3 Supply Chain Management Practice

The main aim of SC is to improve overall firm performance, reduce cost, increase profit, and improve forecast accuracy (Grudinschi*et al.,* 2014). Dotti *et al.* (2012) determined SC as a best practice and highlighted its importance for the effective and successful management and improvement of supply chains.

Many authors studied supply chain management practice and there are various elements and dimensions have measured or used to measure the supply chain practice, for more exploration in the following table some of them:

No	Author	Dimensions
1	Chin et al. 2011	Information sharing, customer relationship, strategic supplier partnership, material flow management and corporate culture.
2	Inda , et al , 2014	Strategic supplier partnership , customer relationship , information sharing
3	Min &Mentzer , 2004	There are seven elements of supply chain practice such as agreed vision and goals, information sharing, risk and award sharing, cooperation,process integration, long-term relationship and agreed supply chain leadership.
4	Chen &Paulraj, 2007	Using supplier base reduction , long-term relationship , communication , cross-functional teams and supplier involvement to measure buyer supplier relationships
5	Tan, Lyman and Wisner, 2002	Six elements of supply chain practice (using factor analysis) supply chain integration , information sharing supply chain characteristics customer service management , geographical proximity and JIT capability
6	Alvarado &Kotzab, 2001	Using inter-organizational system in supply chain practice such as EDI , and elimination of excess stock levels by postponing customization toward the end of the supply chain
7	Tan , Kannan and Handfield,1999	Supply chain practice includes purchasing quality , and customer relations

Table 1: Dimensions of SCM practices

(Abdelsalam Hamidand SiddigBalal Ibrahim, 2014) discussed the following supply chain practice in their article in International Journal of Science and Research (IJSR), August 2014

i. Customers Management

Organizations depend on their customers and therefore should understand current and future customer needs, meet customer requirements, and strive to exceed customer expectations. Customer relationship management (CRM) is an important component of SCM. A firm's customer relationship practices can generate the organizational success in supply chain management practices efforts as well as its performance considered that customer relationship management can be seen as the consistent organizational activity under usage of integrated selling, marketing and service strategy. That is, trying to define the real need of the customer, by the enterprise integrating various process and technology, in asking internal product and service improvement, in order to dawn effort of enhancing customer satisfaction and loyalty.

ii. Suppliers Management

Supplier's partnership represents the long-term relationship between the organization and suppliers. An effective supplier's management can be a critical component of a leading edge supply chain. Through strategic supplier partnerships, organizations can work closely with suppliers who can share responsibility for the success of the company found that the collaboration with other firms or organizations, also include suppliers, has positive significant impact on process innovation and incremental product innovation. Such strategic supplier partnerships should enable successful SCM.

iii. Supply chain integration

The basis of integration can therefore be characterized by cooperation, collaboration, information sharing, trust, partnerships, shared technology, and a fundamental shift away from managing individual functional processes, to managing integrated chains of processes. The extent of integration can begin with product design, and incorporate all steps leading to the ultimate sale of the item (Transportation and Distribution, Modern Materials Handling, Some authors also include all activities throughout the useful life of the product including service, reverse logistics and recycling.

iv. Speed of Responsiveness

(Hamid and Tan, 2016)mentioned the sub-constructs for supply chain responsiveness includes operation system responsiveness, logistic process responsiveness and supplier network responsiveness. Operation system responsiveness is the ability of firm's manufacturing system to address changes in customer demand. It includes both manufacturing and service operation, Supplier network responsiveness is the

ability of the firm's major suppliers to address changes in the firm's demand. A key to responsiveness is the presence of responsive and flexibility partners upstream and downstream of the firm.

v. Information sharing

Information sharing is one of the most important tools for achieving an integrated and coordinated supply chain. (Lee, 2014) stated that information should be interoperable, which means that one system can talk to another. (Zailani and Rajagopal, 2005) add that the technological wave of internet and e-commerce provides a new opportunity to create a "smart" integrated supply chain. (Sridharan and Simatupang, 2005) defined information sharing as the access to private data between business partners thus enabling them to monitor the progress of products and orders as they pass through various processes in the supply chain. They identified some of element that comprise information sharing, consisting data acquisition, processing, storage, presentation, retrieval, and broadcasting of demand and forecast data, inventory status and location, order status, costrelated data, and performance status Internet, Intranet, and Extranet can be distinguished based on characteristics including access, users, and information.

2.1.4 Food Supply Chain Performance

Supply Chain Performance refers to the extended supply chain's activities in meeting end-customer requirements, including product availability, on-time delivery, and all the necessary inventory and capacity in the supply chain to deliver that performance in a responsive manner. It also crosses traditional functional organization lines such as procurement, manufacturing, distribution, marketing & sales, and research & development.

Supply-Chain-Operations-Reference model (SCOR) is another general and comprehensive supply chain performance measurement framework developed and endorsed by the Supply-Chain Council (Council, 2003). SCOR is a process reference model that has been developed so as to serve as the cross-industry standard diagnostic tool for supply chain management.

The main factors that indicate food supply chain performances are:

i. **Efficiency**

Supply chain efficiency measures how well the resources in the supply chain are utilized (Pettersson and Segerstedt, 2014). Efficiency signifies a level of performance that describes a process that uses the lowest amount of inputs to create the greatest amount of outputs

ii. Flexibility

Flexibility may be thought as the ability to change or react to environmental uncertainties within less time, effort, cost, and without compromising overall performances.

iii. Quality and safety

Aung and Chang, (2014) argued that the current food labeling system can't guarantee food safety and quality. It is believed good traceability systems helps to minimize the production and distribution of unsafe or poor quality products, thereby minimizing the potential for bad publicity and liability. In this study, quality and safety was analyzed from regulatory efforts perspectives. The chain actors, wholesalers and retailers will be asked regarding the existence of product standards and related rejections, production process inspections, and product quality and safety inspections along the supply chain.

iv. Level of integrations

From food supply chain perspectives, these activities to be integrated in the supply chain may include all activities associated with the flow and transformation of food products from the raw materials stage, through the end user, as well as the associated information and finance flows. Supply chain integration affects operational performance, costs, and efficiency along the supply chain (Bagchi*et al.,* 2005).

In this study, how the chain actors' governance structure choice influences the level integration is evaluated. The level of integration is analyzed from the relationship among the chain actors point of view. The relationship of the focal firm with its suppliers and customers in terms of frequency of transactions, size of transactions (money and volume of transactions), betraying of transaction contracts, overall long time cooperation, and dependability on the relationships were evaluated through questionnaires.

2.1.5 Challenges of Supply Chain

The term "supply chain management" arose in the late 1980s and came into widespread use in the 1990s. Prior to that time, businesses used terms such as "logistics" and "operations management" instead. Some definitions of a supply chain are offered below:

"A supply chain is the alignment of firms that bring products or services to market. (Carter, C.R., Ellram, L.M. and Ready, K.J. , 1998)

"A supply chain consists of all stages involved, directly or indirectly, in fulfilling a customer request. The supply chain not only includes the manufacturer and suppliers, but also transporters, warehouses, retailers, and customers themselves." (Chopra, S., Meindl, P., 2001)

"A supply chain is a network of facilities and distribution options that performs the functions of procurement of materials, transformation of these materials into intermediate and finished products, and the distribution of these finished products to customers." (Ganeshan, R., Harrison, T. P., 1995)

A supply chain is all activities associated with the flow and transformation of goods from the raw materials stage, through to the end user, as well as the associated information flows. Material and information flow both up and down the supply chain. (Handfield, R.B., Nichols, E.L. Jr., 2002)

A supply chain is the series of activities and organizations that materials – both tangible and intangible – move to their journeys from initial suppliers to final customers. (Waters, D. (ed.), 2007)

In its simplest form, a supply chain is composed of a company and the suppliers and customers of that company. This is the basic group of participants that creates simple supply chain. Extended supply chains contain three additional types of participants. First there is the supplier's supplier or the ultimate supplier at the beginning of an extended supply chain. Then there is the customer's customer or ultimate customer at the end of an extended supply chain. Finally there is a whole category of companies who are service providers to other companies in the supply chain. These are companies who supply services in logistics, finance, marketing, and information technology. In any given supply chain there is some combination of companies who perform different functions. There are companies that are producers, distributors or wholesalers, retailers, and companies or individuals who are the customers, the final consumers of a product. Supporting these companies there will be other companies that are service providers that provide a range of needed services. Producers or manufacturers are organizations that make a product. This includes companies that are producers of raw materials and companies that are producers of finished goods. Producers of raw materials are organizations that mine for minerals, drill for oil and gas, and cut timber. It also includes organizations that farm the land, raise animals, or catch seafood. Producers of finished goods use the raw materials and sub-assemblies made by other producers to create their products. Distributors are companies that take inventory in bulk from producers and deliver a bundle of related product lines to customers. Distributors are also known as wholesalers. They typically sell to other businesses and they sell products in larger quantities than an individual consumer would usually buy. Distributors buffer the producers from fluctuations in product demand by stocking.

In recent years consumers' habits concerning food purchases have been changing due to a desire for healthy eating and sustainable consumption. Consumers who look for food products of high quality and well-known origins turn increasingly to more direct and more transparent supply chains (SCs).. In this context, short food supply chains (SFSCs) respond to the demand of consumers for more proximity and quality, while providing small-scale producers an opportunity for autonomy and enhanced income. The French Ministry of Agriculture, Food, and Forestry defines SFSCs as the "commercialization of agricultural products through direct selling or indirect selling when only one intermediary is involved". FSCs typically involve producers with limited production and logistics capacities. By participating in

SFSCs, they find themselves suitable marketing channels that enable them to become entrepreneurs. Accordingly, (Bayir, B. *et al*, 2022) by reviewing many literatures and analyzing the nature of challenge, strategy and operational level identify six factors that affect supply chain using SCOR model.

i. Unfavorable Supply Chain Operating Rule

In the last ten years numerous projects on supply chain collaboration were done to analyze how firms could use their suppliers' and customers' processes, information, technology, and capability to enhance competitive advantage. Most projects were done in the front-end of supply chains that is in the interface between retailer and manufacturer. But also in the interface between manufacturers and suppliers and/or third parties numerous enhancements were made. The last year's manufacturers have been instigated to focus on core business resulting in the outsourcing of non-core activities such as transportation and the centralization of manufacturing activities. Dr. Ir. Jack G.A.J. van der Vorst, 2004) Collaborative demand planning and replenishment: retailers and manufacturers work together to assess consumer demand and to determine the most appropriate supply management and replenishment approach to meet this consumer demand; Collaborative production: manufacturers and suppliers work together to harmonies the supply of raw materials and the production of end products in such a way as to minimize the stocks within the supply chain and maximize the responsiveness; Collaborative logistics planning: co coordinating transport and warehousing between the various parties involved, including trans shippers, logistic service providers, carriers and recipients. A precondition for supply chain coordination is the establishment of connectivity and transparency, i.e. interconnecting the information systems of the successive partners in the supply chain and exchange information via this infrastructure Although a lot of research and practical experience with SCM-issues has been obtained, we have to acknowledge that few companies have actually established a management environment that supports the integration required for effective SCM. Instead, many chains are still functionally oriented and are characterized by a lack of trust and credibility among the supply chain organizations. In the coming sections we will focus on companies and efforts that have excelled in SCM. The reader should keep in mind that they are the front-runners.

ii. Lack of Supply Chain Assets

A strong link between investing in the transport infrastructure and a growing GDP can be expected (Kovács & Spens, 2006). According to Simchi-Levi, Kaminsky and Simchi-Levi (2003), economies in transition are characterized by an underdeveloped transport infrastructure, varying supplier operating standards, unavailable information and communication systems support and variably available human resources. The impact of the infrastructure is considered to be different in the developing and developed regions (Lewis, Semeijn, & Vellenga, 2001). If you're looking for ways to improve productivity in your

company's supply chain, the answers will probably lie in the way people, assets and technology the three pillars of productivity are managed. Just like many supporting structures, the three pillars of supply chain productivity, are separate but interdependent entities. If any of the three pillars lack strength, sub-optimal productivity is only to be expected. Improving the strength of any single pillar will add to the integrity of the others and productivity will improve. While it's not advisable therefore, to focus on any one of the three pillars exclusively, it does make sense to understand some of the ways in which each can be reinforced and how doing so might yield productivity increases.

Distribution centers, warehouses, a fleet of trucks or other transportation units, mechanical handling equipment, and sundry tools of the trade are all assets which influence productivity depending on how they are used and managed. The harder you can make your company's assets work, the greater the productivity you can expect. *(*Rob O'Byrne, 1997)

This is an important element of supply chain network optimization; an activity which in itself can improve productivity. Optimal facility location will differ from one organization to the next, so it's really not possible to generalize on where your facilities should be sited. However, an analysis of your current network, conducted with the help of some modeling software and perhaps an external consulting firm, should highlight any existing possibilities to improve supply chain productivity through a network redesign. *(*Rob O'Byrne, 1997)

If your company operates an in-house fleet of vehicles, you should investigate whether they are the best fit for your operation. And after analyzing all the factors it will make a difference to your fleet productivity and therefore, that of your entire supply chain. Sometimes the objective of raising supply chain productivity can best be met by outsourcing processes to third party logistics providers. Under the right circumstances, outsourcing can be more cost-effective, as well as more productive than keeping logistics in-house. Sometimes the objective of raising supply chain productivity can best be met by outsourcing processes to third party logistics providers. Under the right circumstances, outsourcing can be more cost-effective, as well as more productive than keeping logistics in-house. . *(*Rob O'Byrne, 1997)

iii. Scarce Supply Chain Resources

The basis of higher supply chain efficiency is that the network manager knows the capabilities of the actors responsible for creating value, and can therefore better manage value-creating activities and processes (Möller, Rajala, and Svahn 2005). This requires an understanding of the effects SCM resources have on the performance of the firm and the rest of the supply chain (Cook, Heiser, and Sengupta 2011; Johnson and Templar 2011), and on the firm's long-term competitive advantage (Priem

and Swink 2012). From the resource-based theory of the firm (Penrose 2009) and Grant's (1991) proposals regarding competitive advantage, two drivers of the competitive advantages of networks emerge, namely resources and capabilities. Following Wernerfelt (1984), a resource is anything that might be either strength or a weakness of a given firm. SCM-related resources are, as Barney (1995) and Penrose (2009) suggest, all financial, physical, human and organizational assets that firms use to develop manufacture and deliver products, the organizational assets being their SCM-related capabilities. In this context, the understanding of the supply chain is as a bundle of heterogeneous resources and capabilities, and the competitiveness of such vertical networks comes from the ability to exploit and organize heterogeneous resources across firms, and take advantage of the capabilities of supply chain partners as a group. Such an approach requires a complex effort to make use of valuable, rare and difficult-to-imitate resources in order to achieve a sustained competitive advantage (Grant 1991).

iv. Poor Supply chain Network

Supply chain network is the typical challenges that modern supply chains especially of developing countries face. The last decades have witnessed a radical movement from standalone, vertically integrated supply chains toward networked supply chains in which numerous suppliers belonging to several tiers in a network design of products for a few customers, who sometimes compete and sometimes cooperate. Lows of information and money through the network are as vital as flows of products themselves. Information conveys demand all the way from customers to manufacturers, and it also helps partners in the supply chain communicate orders, invoices and payments. The complexity of supply chain networks often results in intricate flows of information and payment. This radical transformation from vertically integrated local supply chains to highly decentralized global supply chain networks has been fueled by the emergence of low-cost outsourcing options. (Serguel Netessine, 2007)

If organized properly, these networks can enable the creation of superior products at the lowest possible cost while ensuring speedy delivery to the consumer. However, to realize these benefits, a number of new challenges need to be addressed. Among these challenges is the fact that longer supply chains complicate information sharing and demand forecasting and require more inventories; that contractual relationships with suppliers need to be intertwined with other relationships built purely on trust and long-term interactions; that concerns about supply chain disruptions call for preemptive strategies, etc. For this reason, Iansiti and Levien (2004) call such networks "business ecosystems" in which every member's fate is tied to the health of the network as a whole. Thus, each company needs to keep an eye on the financial health of each customer, supplier and business partner in its ecosystem.

Little is currently known about ways to achieve control and coordination in supply chain networks. Much academic literature focuses on the control and coordination of simple supply chains, with conclusions frequently based on results gathered from considering one upstream and one downstream company (Cachon 2005).

v. Monotonous Supply chain Regulation compliance

Compliance with public regulations is a minimum requirement for firms to gain market access. How it affects the functioning of markets and the interaction between different stakeholders has been extensively analyzed in the literature on industrial organization and international trade. It has, however, become more common that public regulations stipulate requirements concerning the quality of the final product (sold to consumers) but, to some extent, leave it up to individual firms to choose the appropriate way of achieving this. Partly in order to comply with public standards, farmers and agro-food firms have had to change their production processes and to improve coordination between different parts of the supply chain. This has, to a large extent, been achieved by adopting and requiring suppliers to adopt various private standards that are more demanding than the legal requirements. Some of these standards are firm-specific while others are collectively adopted by a group of stakeholders in the supply chain (producers, process firms and retailers). If firms do not adhere to regulations they may, based on public monitoring and inspection, incur economic losses because of fines, deadweight losses generated by the withdrawal or recall of certain products, temporary or permanent cessation of business etc. Such potential costs give firms an incentive to adopt private standards in order to ensure compliance. Firms may also adopt various standards in order to avoid legal liability and negative demand effects in case a food safety crisis occurs. These arguments cannot, however, fully explain the incentives for companies to develop and adopt voluntary standards that go beyond legal requirements and that sometimes are quite costly to implement. The expected benefits of adopting a private standard can be larger if evaluated in a dynamic setting, taking into account the changes in the upstream industrial structure and/or in the supply chain structure (Caswell *et al*., 1998).

vi. Lack of Information technology in Supply chain

Today companies are often not considered independent entities, but parts of multi-company, multi-echelon networks, i.e. supply chains, delivering goods and services to the final customer (Christopher, 1992; Lambert and Cooper, 2000). Supply chain management (SCM) literature proposes that integrated control of these multi-company networks can provide significant benefits (Cooper et al., 1997; Burgess, 1998; de Leeuw et al., 1999; Mason- Jones and Towill, 1999; Norek and Pohlen, 2001). The utilization of information technology (IT), in turn, is considered an imperative requirement for managing these networks, and has been associated with significant supply chain efficiency improvements (Lee and Billington, 1992; White and Pearson, 2001). Although the importance of IT for efficient SCM is widely

acknowledged, empirical research assessing how IT is in practice used for the purposes of SCM is narrow. More specifically, majority of the prior research has focused either on modeling the benefits of inter- organizational information technologies and information sharing, or on assessing the impact of specific technologies on supply chain efficiency. Consequently, the actual uses of IT in supply chain management as well as the reasons for using IT in a specific way still remain unclear.

2.2 Empirical Literature review

2.2.1 Food Supply Chain practices

First to see supply chain practices across all business in Ethiopia; Admaw (2010) studied the practice of SCM for Ethiopian textile firms. It was found that, SCM practices in Ethiopian textile firms are weak and not considering SCM as a strategic tool for competition. Business managers of the textile firms' didn't give attention for SCM theories and practices. Also Dereje, (2012) studied the impact of SCM performances in metal and engineering industries. The result of the study shows that the implementation of SCM in this industry is weak. Also the SCM practices don't have any relationship with organizational performances except internal lean practices. In addition, Belay, (2011) studied the practices of SCM in cement industries. The result of the thesis shows similar to other industries in the country i.e. the practice of SCM in cement industry is almost poor. There seems that since the demand outweighs the supply of the cement, which contr000pibutes for not using SCM as a competitive strategy.

Bart Minten*et,al* (2013) conducted a survey 1,800 primary survey interviews in total with producers, traders, truck drivers, and retailers were conducted on teff value chain form production area to Addis Ababa and founds that the value chains are not relatively sophisticated. There are no interlinked transactions with buyers of the produce (which is often seen in other countries, especially in more developed value chains), the role of credit is minor, and most of the transactions are cash transactions.The majority of the farmers would not have accepted a significantly lower price at the time of their sales, indicating that distress sales are of relatively minor importance in farmers' marketing decisions.

2.2.2 Challenges of Food Supply Chain Management

Local studies like (KETEMA *et al.,* 2016)) conducted study on Analysis of the dairy value chain: Challenges and opportunities for dairy development in Dire Dawa, Eastern Ethiopia. The finding of the study pointed out that the roles and functions of all the actors in the value chain are not clear and there is a weak link between milk producers, traders and other stakeholders. Shortage and high cost of feed, lack of institution that provides dairy related information, difficulty to get land, disease prevalence, lack of technical support, and lack of dairy related technologies are the major constraints related to milk

production. whereas problems related to milk marketing include lack of quality control of milk, lack of cooling and storage facilities at milk vending sites, poor quality of milk supplied from rural areas, sale of raw milk, inappropriate milk handling and storage vessels, and spoilage of milk due to lack of preservation and processing facilities.

Study conducted by Tadesse (2018) on supply chain management approach to reduce food losses empirical results of selected food commodities in Ethiopia. The finding of the study indicated that significant losses at each stage of the food supply chain, poor handling practice at milk collection points, the threshing process in the teff chain, harvesting problems and bad weather conditions in the wheat chain and poor packing display and processing facilities in the Kocho and bulla chains were forefront factors causing losses.

2.2.3 Food supply chain performance

(Kenea Amentae, Gebresenbet and Ljungberg, 2015) conducted study on Characterizing Milk Supply and Marketing Chains and Losses in Wolmera and Ejere Districts of Ethiopia. The finding revealed that farmers, cooperatives/unions, traders, and catering institutions were the major chain actors in milk chain in the study area. With 73% of milk sold by farmers passing through cooperatives/unions to the next chain actors, cooperatives/unions were the focal firms in this supply chain. Production was characterized by smallholders with few numbers of cows and low productivity of milk per cow per day. Cow breed and lack of access to credit were identified as critical resource and the most constraint that hinder production improvement. Marketing relationships among the chain actors were characterized as lacking long-term market orientation and were mostly on the spot and transaction based. The assessment on the enabling environment indicated further need of support from governmental and non-governmental stakeholders to build the capacity of chain actors, particularly the farmers.

Hana (2016) also studied the effect of SCM practice on customer satisfaction in Ethiopian Sugar Corporation and concludes that the case company's orientation towards SCM is traditional that lacks substantial indicators of an integrated, efficient and effective SCM. Poor IT facilities lead to poor information sharing and poor information sharing practices makes a supply chain management ineffective.

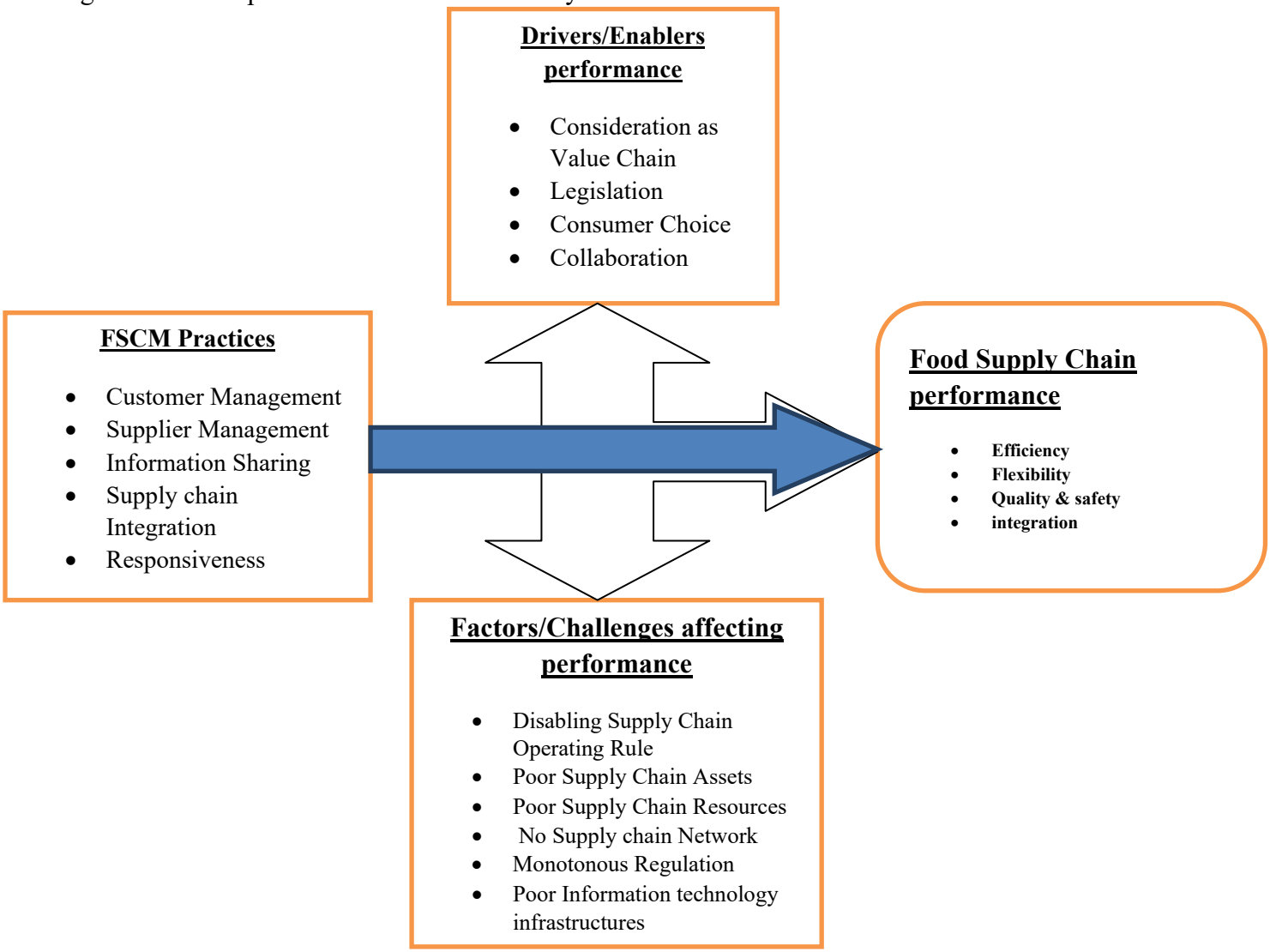
Despite the recently efforts from the government side to create awareness of supply chain management to incorporate in the strategic plans and introducing Ethiopia Government procurement (EGP) as platform tool to create transparent, efficient and simplified procurement; the supply chain have got attention and Universities are opened supply chain departments; Addis Ababa University is also organizing workshops and webinars by cooperating with different organs to create awareness and to introduce new ideas and show ways to implementation and improvement in the supply chain industry.

Studies show that the awareness of SCM in Ethiopia is still at infant stage and performance of Ethiopia food supply chain is very poor, we can be witnessed that we are reading and watching every day's social and main media streams are reporting the government interference into the supply chain of basic food items due to supply chain and price manipulations by different supply chain actors.

2.3 Conceptual Frame Work

Conceptual frame work is designed based on tremendous literatures; the researcher organizes the conceptual framework in assessing factors influencing food supply chain management practice and identifies the challenges that hinder performance. In this study, food supply chain factors will be identified through close ended questionnaires; Food supply chain management practices treated in terms of supplier and customer relationship management, information sharing practice, information technology practice, internal operations and Supply chain performance will be treated in the context of efficiency, flexibility, quality and safety and level of integration.

Figure 2.1 Conceptual Frame work of the study



Source: Author Own Illustration from different literature

CHAPTER THREE

Research Methodology

This chapter presents the research description of research area, approach, methods and design will be used by the study, while highlighting the population and issues related to sampling technique, sample size determination, and data collection instrument. Besides, the chapter outlines the approach to data collection and analysis for the purpose of hypotheses testing.

3.1 Description of the study area

The unit of this study is Addis Ababa food supply chain, the major terminal market. Amongst 18506 registered wholesalers and retailers at Addis Ababa trade bureau, this paper will consider 12851 to draw a sample as 5655 are managed under one management umbrella as they are branches of the main business. Using Yamane model 388 sample sizes was considered. Accordingly, well structured questionnaires aiming to answer the research question was developed and distributed to the respondents. The targeted respondents were managers of the business. However the manager of the business may decide and assign concerned employee of the organization to fill the questionnaires. The main food supply chain practice dimensions will assessed in terms of the sample selected and the main challenges of food supply chain that influence Addis Ababa food supply chain will be assessed and evaluated in terms of performance.

3.2 Research Approach

This paper will be used qualitative approach to create a better understanding of the issue covered in the study as the method enables to assess and interpret the factors that affect food supply chain of Addis Ababa.

Therefore, qualitative approach will be used to describe the practices of food supply chain in Addis Ababa and to evaluate and measure level of relation of the factors with food supply chain performance.

3.3 Research Design

A study design is an important part of research because it serves as a guideline as to how integrate the different components of the study in coherent and logical way. This paper will use explanatory research design to effectively address the research problem. Because the purpose of this study is to assess, identify and measure the performance of Addis Ababa food supply chain. And also to describe the facts with adequate and accurate interpretation of findings that helps to describe the situations of the issue

under study through close ended questionnaires. In addition this study also will explain understanding, predicting and controlling the relationship between variables.

3.4 Population

According to (Hair *et al.* 2010), population said to be a specified group of people or object for which questions can be asked or observed made to develop required data structures and information. Accordingly, as per to Addis Ababa trade bureau, the total number of wholesalers and retailers shops of food items in Addis Ababa are 18506 as per January 2022 data out of which 5655 shops are branch shops of the main businesses. As the management and supply chain operation is managed by same organ, the paper will consider the branches as one and the same and decided the target population to be 12851 which is found by deducting the branches from the total population.

3.4.1 Sampling technique

In order to reduce sampling bias, create accurate sample and to collect comprehensive, reliable and unbiased information to draw conclusion and help to recommend, simple random probability sampling methods will be employed. Accordingly, the samples will be selected from our target population using random number table.

3.4.2 Sampling design and sample size

How many responses do you really need to make realistic and meaningful conclusion for the scientific study is not an ending quandary for researchers. The larger the sampling size of a research yields more accurate result. However, excessive responses is time consuming and costly.

Hence, research requires and understanding of the statics that drive sample size decision. There are many ways from complex to simple equation that help to decide sample size.

Before sample size determination the following points need to be defined and determined.

Population size: the total number of peoples, objects or things that the target study is conducted. The number can be finite and known and can be infinite and unknown. It is common for the population to be unknown or approximated.

Margin of error (confidence interval): no sample will be perfect, and so you need to decide how much error to allow. The confidence interval determines how much higher or lower that the populations mean you are willing to let your sample mean fall. It will take the proportion of z, with a margin of error of +/- 5%

Confidence level: is the confidence level of the actual mean fall within the confidence interval. The most common confidence interval is 90% confident, 95% confident and 99% confident.

Standard of deviation: is the variance expected from the response. Since the study is not administered, the safe is using .5. It is the common to ensure that the sample will be large enough.

Then the corresponding Z-score for the common confidence levels are:

- 90% Z-score =1.645
- 95% Z-score =1.96
- 99% Z-score =2.326

For a different confidence level, you may use Z-score table to find the score.

For unknown population size common equation adopted by different scholars is:

$SS= (\text{Z-score})^2 * (SD) * (1-SD) / (e)^2$

Where;

SS= Sample size

SD= Standard of deviation

e = margin of error.

Yamane (1967:886) provide a simplified formula for known population size.

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

Where; N = population size

Thus, the sample size will be;

$$SS= \frac{12,851}{1+ 12,851(0.0025)}$$

$$= \underline{387.93}$$

Therefore the sample size for this research is 388 respondents
Thus, the sample size of 388 respondents will enable to conduct precise research and conclude the findings and to forward possible recommendations.

3.5 Data source and analysis

Basically there are two sources of data namely, primary and secondary source. The researcher will use both primary and secondary sources of data. The primary source of data was collected from the respondents of wholesalers and retailers of food items through questioners. The secondary data were collected from official documents, previous studies and from the internet. Accordingly, both qualitative and quantitative data were used to get relevant and appropriate information on the specific issues of the study using major data collection instrument. Well organized questionnaires will be delivered to the respondent either by post or mail by requesting them to answer the questions and return back within specified reasonable time.

After collecting the data through questionnaires, the researcher has organized and prepared the various data depending on the sources of information. Moreover, in order to ensure consistency of data, editing was carried out by the researcher. Once editing has done, data will be analyzed qualitatively and quantitatively. Quantitative data will be collected through questioners will be arranged using Likert Scale ranging from 1 to 5 (1= Very Low and 5= Very High). And this study will analyze the data gathered using Statistical Package for Social Science (SPSS) version 26and EXCEL. Then it will be presented using tabulation, percentage and figures so that findings will be easy to examine and to understand by everyone. And inferential statistics analysis will also be used to show the relationships between the antecedent and the consequences.

3.6 Reliability

Reliability and validity are important factors when performing research. Reliability aims to secure that the measuring instrument should not generate any random errors. Reliability refers to the quality of a measurement procedure that provides repeatability and accuracy. To be able to assess the internal consistency between the items in the research instrument, Cronbach Alpha coefficients will be calculated. A Cronbach Alpha coefficient is based on the average correlation of variables within a test. The larger the value of the Cronbach Alpha coefficient, the higher the internal consistency and the more reliable the scale will be used. The closer the Cronbach Alpha coefficient is to 1.0 the greater the internal consistency of the items in the scale. The Cronbach Alpha coefficient should be equal or greater than 0.7 for an acceptable reliability. Therefore, to check and test reliability of the study **Cronbach's alpha,** α (or *coefficient alpha*), (Lee Cronbach, 1951) will be conducted.

For this research, the overall value is 0.99 for all the mentioned variables therefore the data collected from the respondents confirms reliability and consistency test. The summery is as follows.

Cronbach Alpha test

Variable	*Cronbach Alpha*	*Number of items*
Supply Chain Operating Rule	0.970	4
Supply Chain Assets	0.965	4
Supply Chain Resources	0.972	4
Supply chain Network	0.962	4
Regulation compliance	0.934	4
Information technology	0.971	4
Overall	**0.993**	**24**

Source: survey (2022) SPSS output

3.7 Validity

The validity is the measuring instrument should not generate systematic errors. According to Malhotra (2010), there are three types of validity in a study: content validity, predictive validity, and construct validity. Therefore in this paper Malhotra validity test is employed to test the validity of the study.

3.8 Ethical Consideration

The study will be given priority attention ethics of research. Before proceeding to undertake the study, official letter from the university will be taken to be provided to the concerned bodies to receive permission. While contacting respondents, the purpose of the study will be explained at the beginning of conversation. Their full consent will be first checked before starting interviews or discussions. Besides, they were informed that their information would be kept confidential, and would be used for the study purpose. The study will be committed to present response as it is without misinterpretation or exaggeration. Ethical issues consideration on study was necessary for the purpose of ensuring the privacy as well as the safety of the respondent. Hence, this study fully considers the ethical matters of all the individuals involved in the study.

CHAPTER FOUR

Results, Discussion, and Interpretation

4.1 Response rate

This chapter presents the analysis of study findings on the practices, factors, and performance of food supply chain management in Addis Ababa. The findings were analyzed using the variables related to the research objective. Based on the sample size computation, it was required to collect 388 responses and it was managed to collect 341 responses making the rate 87.8%.

4.2 Results

4.2.1 Demographic Profile

The general information included in the first phase of the question is the Demographic characteristics having Gender, marital status of the business owners, Business description of the organization, Years of operating experience, Numbers of Employees, and annual sales of your organization. To check its reliability and validity of the collected data, it was required to analyze and interpret the data.

Table 4.1 Demographic Data Category

Variables	***Category***	***Frequency***	***Percentage***
Gender Information	Female	29	8.50
	Male	312	91.50
Marital status of Business owner	Single	17	4.99
	Married	298	87.39
	Widow	21	6.16
	Divorce	5	1.47
Business Description of Organization	Wholesaler	4	1.17
	Retailers	28	8.21
	Wholesaler and Retailer	309	90.62
	Others. Please specify	0	0
Years of operating experience	Less than one Year	6	1.76
	1 – 5 Years	203	59.53
	5 – 10 Years	112	32.84
	10 – 15 Years	9	2.64

	15 – 20 Years	7	2.05
	More than 20 Years	4	1.17
Numbers of Employees	Less than 50	316	92.67
	51-100	23	6.74
	101-250	2	0.59
	251 – 500	0	0
	More than 500	0	0
Annual sales of your organization	Less than 500,000	189	55.43
	500,001 - 1million	36	10.56
	1,000,001- 5 million	93	27.27
	5,000,001- 10 million	12	3.52
	10,000,001 – 50 million	5	1.47
	More than 50 million	6	1.76

Source: survey (2022) SPSS output

a) Gender Information

The table above shows the proportions regarding gender is not evenly distributed. The male respondents constituted the largest share of the gender composition representing 91.5%, while 8.5% were female, as shown on table above. This shows the largest number of respondents were male with 92.5% while female respondents constituted 8.5% of the total respondents implying most business owners in Addis Ababa are Male.

b) Marital status of Business owner

Regarding the marital status of the respondents, respondents that are single were 4.9%, while 87.3% of the total respondents were married. While 1.4% of the sampled respondents were divorced, 6.1% of the respondent was widowed. This implies 93.5% of the respondents were single and married. This makes the study more reliable as the marital status of the most respondents is married.

c) Business Description of Organization

With regards to the type of the business, most of the respondents which is 90.6% (309) are who are involved in both Wholesaler and Retailer. Next to that, 28 respondents make of 8.2% of the sample size having only a Retailers job while 4 people with 1.1% holds a Wholesaler job. It can be seen from the result that most of the respondents are involved both in wholesaler and retailers job making the result more reliable.

d) Years of operating experience

Regarding operating year of experience of the company, respondents with less than one years of experience constituted 1.7% of the total respondents, while the respondents with 1 - 5 years of experience were 59.5%. Respondents between 5 - 10 years of experience were 32.8% of the respondents. Respondents with 10 - 15 years have 2.6% of the respondents and those between 15 and 20 constitute 2 %. The rest respondents with greater than 20 years of experience were 1.1% of the total respondents. This demography gives the research more reliability as 92% of the respondents had experience from year one to ten in the sector.

e) Numbers of Employees

Regarding number of employees in the organization, respondents having employees less than 50 are amounted to 92.6%, while those having 51 to 100 employees are amounted to 6.7%. The rest portion with organization owners with employees between 100 and 250 are 0.5%. Most of the organizations under the study have employees up to 50. This shows that they have a potential to grow and be able to create a job opportunity for many.

f) Annual sales of the organization

With regards to annual sales of the organization, respondents with less than 500,000 sales constituting 55.4% of the total respondents, while the respondents with 500,001 - 1million sales were 10.5%. Respondents between 1,000,001- 5 million sales were 27.2% of the respondents. Respondents with 5,000,001- 10 million sales have 3.5% of the respondents and those between 10,000,001 – 50 million constitutes 1.4 %. The rest respondents with greater than 50 million sales were 1.7% of the total respondents. From the result, half of the organization has annual sales of less than 500,000 and the rest half are above having an even distribution.

To sum up the discussion regarding the demographic data, we learn that that Addis Ababa food supply chain is:

- Dominated by male
- The turnover is small
- Less employment opportunity

Therefore, the sector can be characterized under small business which needs attention from the government. We can observe that the city's food supply chain is becoming issue in each month for economist and politicians as the supply chain is under performed.

4.2.2 Enablers of Food Supply Chain Management

One of the objectives of the study is to identify the enablers of Food Supply Chain management of wholesalers and in Addis Ababa. The Parameters considered in this research are Legislation, Consumer choice, Sustainability, Collaboration, and consideration as Value chain. The respondents were required to indicate on a Likert scale of 1-5 where: 1= Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree and 5= Strongly Agree.

Table 4.2 Interpretation Scale

Scale	***Interpretation***
1.00– 1.80	Very low
1.81 –2.60	Low
2.61– 3.40	Moderate
3.41 – 4.20	High
4.21 – 5.00	Very High

Source: Alexander B. (2010)

Table 4.3 Supply Chain Management Enablers

Consideration as Value Chain	***Mean***	***Std. Dev***
All entities along the value chain aspire to move up to increase their share of return.	3.96	0.971
The stakeholder's network involved in the value chain is clearly stated.	2.34	1.329
All entities in the value chain are responsible to add value on the supply chain	1.10	0.477
Overall Mean	**2.47**	
Legislation		
The regulatory body efficiently controlling products to ensure safety and health of the society	3.82	0.926
The regulatory body have competent technology to ensure labelling and treatability	1.23	0.734
There is supportive policy to create facilitative supply chain environment	1.44	0.558
Overall Mean	**2.17**	
Consumer Choice		
The organization has suitable packaging	3.99	1.227
The customer demand is shifted to processed food.	1.99	1.191
The products have enough demand	4.91	0.763
Overall Mean	**3.63**	
Sustainability		
There is energy wastage in your organization	1.69	1.083

Your organization has waste management policy	1.43	0.702
Your organization has sustainable economy	3.11	1.717
Overall Mean	**2.08**	
Collaboration		
There is clear end-to-end collaborative platform across the value chain	1.20	0.683
All entities across the value chain exchange information on time	1.12	0.639
The organization has continuous improvement program that include other entities in the value chain.	1.16	0.599
Overall Mean	**1.16**	

Source: survey (2022) SPSS output

The above table presents the questionnaire requests regarding the enablers for food supply chain management in the organization in Addis Ababa. The following statements represent the related data collected by the researcher.

Table 4.4 Summary of supply chain enablers is presented in the below table

Enablers of Supply Chain	***Mean***	***Results***
Consideration as Value Chain	2.47	Low
Legislation	2.17	Low
Consumer Choice	3.63	High
Sustainability	2.08	Low
Collaboration	1.16	Very Low

a) Considering Supply Chain as Value Chain

The respondents are confident that the entities along the value chain aspire to move up to increase their share of return with a mean value of 3.96 with a standard deviation value of 0.971. But with regards to Stakeholder's network, they believe that it is not clearly stated with a mean value of 2.34 and standard deviation value of 1.329. In addition to this, they strongly disagree that all entities in the value chain are responsible to add value on the supply chain. As a result, the overall analysis of these parameters is driven to be low with a mean value of 2.47.

b) Legislation

Considering Legislation, the respondents responded with low with an overall mean of 2.17 and standard deviation of 0.605. The respondents response is high with the regulatory body efficiently controlling products to ensure safety and health of the society with a mean value of 3.82 and standard deviation of

0.926 but they strongly disagree with the regulatory body having competent technology to ensure labeling and treatability and there is no supportive policy to create facilitative supply chain environment.

c) Consumer Choice

In the case of consumer choices, there are three parameters considered in this aspect. The First aspect is weather the organizations in Addis Ababa have suitable packaging or not. Regarding this there was high response rate with the mean value of 3.99 and standard deviation value of 1.25 that they have suitable packaging. They also gave their strong agreement on the products having high demand. Regarding customers demand shifting to processed food, the response rate was low that indicate this is not the issue in the case of the organizations considered in this research. All in all, consumer's choice is one of the enablers of Food Supply Chain Management that most respondents agreed to.

d) Sustainability

In the case of Sustainability, there are also three parameters considered in this aspect. To begin with, the respondents did not agree with having wastage of energy in the organizations. That means, the organizations do not waste their energy in areas that do not add value to the supply chain. In the case of having wastage management policy, the response rate is very low with a mean value of 1.43 and standard deviation of 0.702 that these organizations do not apply or have wastage management policy. With regards to having sustainable economy, the response is moderate.

e) Collaboration

Considering collaboration, the respondents responded with strong disagreement with a mean value of 1.16 and standard deviation value of 0.623 with the overall ideas of having collaboration as one of the enablers. They believe that there is no clear end-to-end collaborative platform across the value chain and all entities across the value chain do not exchange information on time. These organizations lacks continuous improvement program that include other entities in the value chain.

Samir Dani stated factors influencing food supply chain in his book titled "Food Supply Chain Management and Logistics published in 2016; Considering Supply Chain as Value Chain, Legislation, Consumer Choice, Sustainability and collaboration is stated as potential factors that enable the supply chain management. Likewise, this paper finds those factors are significant variables that enable the supply chain for Addis Ababa wholesalers and retailers of food items.

4.2.3 Supply Chain Management Practices

One of the objectives was to assess how the food supply chain management is being practiced in Addis Ababa organizations. The following table will show the different practices result considered in the

research like Customer management, Supplier management, and Supply chain Integration, Speed of responsiveness and Information Sharing. The result is analyzed using Likert scale method.

Table 4.5 Supply Chain Management Practices

Customer Management	***Mean***	***Std. Dev***
Organization frequently interacts with customers to set its reliability, responsiveness, and other standards	3.89	0.800
Organization's goods are stored at appropriate distribution points close to customers in the supply chain.	2.17	0.903
Organization frequently measures and evaluates customer satisfaction	3.49	1.257
Organization has frequent follow-up with its customers for feedback	3.23	1.174
Overall Mean	**3.19**	
Supplier Management		
organization helps its suppliers to improve their product quality	3.45	1.096
organization has continuous improvement programs to establish long lasting relation with its suppliers	3.50	1.338
organization regularly solve problems jointly with its suppliers	3.37	1.050
organization rely on few dependable supplier	3.62	.917
Overall Mean	**3.48**	
Supply Chain Integration		
supply chain members have common agreed goals for supply chain development	3.01	1.280
supply chain members clearly define roles and responsibilities of each other cooperatively	1.57	.788
Firms in my supply chain create compatible communication and information system	1.60	.686
There is fair risks and rewards share across my supply chain members	2.22	1.107
Overall Mean	**2.10**	
Speed of Responsiveness		
organization operation system is well address changes in customer demand	2.64	1.261
organization logistics satisfy customer demand	3.05	1.203

Organization use information technology to trace and respond fast. formation flow across your supply chain	1.15	.454
Actors in my Supply chain are flexible to meet customer requirement	3.56	1.236
Overall Mean	**2.60**	
Information Sharing		
organization use Information Technology to manage its supply chain	1.08	.329
The supply chain is smart integrated so that information is shared across all actors.	1.42	.625
Relevant data can be accessed across the supply chain actors to forecast demand, to manage inventory and track status	1.45	.779
Overall Mean	**1.31**	
Grand Total Mean	**2.53**	

Source: survey (2022) SPSS output

Table 4.6 Summary of supply chain management practice

Supply Chain Practice	***Mean***	***Results***
Customer Management	3.19	Moderate
Supplier Management	3.48	Practiced
Supply chain integration	2.10	Low practice
Speed of response	2.60	Low practiced
Information Sharing	1.31	Not practiced

a) Customer Management

The above table presents the questionnaire requests regarding supply chain management Practice. The following statements represent the related data collected by the researcher.

- The respondents agree that organization practice frequently interacts with customers to set its reliability, responsiveness, and other standards with mean of 3.89.
- They do not agree with the organization practices storing the goods at appropriate distribution points close to customers in the supply chain with 2.17 mean.
- Concerning weather, the organization frequently measures and evaluates customer satisfaction and if there is frequent follow-up with its customers for feedback or not, the respondent's replay was moderate with 3.23 mean.

Most respondents agreed that organization frequently interacts with customers to set its reliability, responsiveness, and other standards. Looking to the standard deviation, 0.800 implies that the answers of the respondents were narrowly distributed with in this value apart from the mean, thus the answers are highly concentrated around the mean.

Most respondents disagreed that the organization's goods are stored at appropriate distribution points close to customers in the supply chain by drawing some ambiguity to decide the issue regarding agreement and disagreement. Looking to the standard deviation, 0.90 implies that the answers of the respondents were distributed in average within this value apart from the mean, thus the answers are moderately concentrated around the mean.

As the mean value of 3.49 and 3.23 shows respectively, the response rate is moderate on the statement that organization frequently measures and evaluates customer satisfactionand has frequent follow-up with its customers for feedback. Looking to the standard deviations, 1.25 and 1.17 respectively implies that the answers of the respondents were distributed with this value from the mean, thus the answers are moderately concentrated.

b) Supplier Management

From the above table concerning Supplier management, the respondents responded with agreement for the measure statements of Supplier management. For the statement "Organization has continuous improvement programs to establish long lasting relation with its suppliers" and "Organization rely on few dependable supplier" with mean value of 3.50 and 3.62 respectively shows that most of the respondents agreed to the statement. The standard deviations show the respondents response was concentrated around the mean.

Most respondents did not agree or disagree with the statement of organization helps its suppliers to improve their product quality and that organization did not attempt to regularly solve problems jointly with its suppliers. Therefore, it helps to draw a conclusion to decide the issue regarding agreement and disagreement. Looking to the standard deviation implies that the answers of the respondents were narrowly distributed with in this value apart from the mean, thus the answers are highly concentrated around the mean.

c) Supply Chain Integration

Concerning Supply Chain Integration, the respondents responded with neutrality and disagreement for the measure statements applied there.

- With the statement stating, “Supply chain members have common agreed goals for supply chain development”, the respondents stayed neutral with a mean of 3.01 and a standard deviation of 1.28 showing how far the result is far from the average results. This shows that the organizations under study do not have enough information to decide whether the supply chain members are working together towards a common goal.
- On the rest of statement concerning supply chain integration, most of the respondents disagreed that supply chain members have a clearly defined roles and responsibilities of each other cooperatively, these members having compatible communication and information system and in addition to these, the respondents do not agree with if there is fair risks and rewards share across the supply chain members.Looking to the standard deviations (0.78, 0.68 and 1.10 respectively), implies that the answers of the respondents were distributed in average within this value apart from the mean.

d) Speed of Responsiveness

Concerning speed of responsiveness, the respondents responded with disagreement for the measure statements applied there.

For the statement stating “Actors in my Supply chain are flexible to meet customer requirement” the respondents gave their agreement with the mean value of 3.56 with the standard deviation of 1.23. This implies that the members in the supply chain are willing to do whatever it takes for the better performance.

For the statement stating “Organization operation system is well address changes in customer demand” the respondents gave their disagreement with the mean value of 2.64 with the standard deviation of 1.26. This implies that the operation system of the organization in the supply chain does not address the customer demand.

For the statement stating “Oorganization use information technology to trace and respond fast information flow across the supply chain” the respondents gave their disagreement with the mean value of 1.15 with the standard deviation of 0.45. This implies that the organizations do not use information technology to have a fast and smooth flow of information among the members. The respondents thought concerning whether the organization logistics satisfy customer demand or not is neutral meaning they do not have enough information to decide this demand is satisfied or not through the logistic practice available at hand.

e) Information Sharing

Concerning information sharing, the respondents responded with full disagreement for the measure statements applied there. The results are as follows.

- With regards to the statement "Organization use Information Technology to manage its supply chain" with a low mean value of 1.08 and standard deviation value of 0.32, it can be drawn a conclusion that these supply chain members do not use Information Technology to manage their work.
- With regards to the statement "The supply chain is smart integrated so that information is shared across all actors" with a low mean value of 1.42 and standard deviation value of 0.62, it can be drawn a conclusion that there is no integration so that information can be shared among the supply chain members.
- With regards to the statement "Relevant data can be accessed across the supply chain actors to forecast demand, to manage inventory and track status" with a low mean value of 1.45 and standard deviation value of 0.77, it can be drawn a conclusion that no data is accessed to forecast demand, to manage the inventory system and track their status.

Many Authors studied supply chain management practice and there are various dimensions to measure the practice. Abdelsalam Hamidand Siddig and Balal Ibrahim, 2014 in their article on the study of supply chain management practice and supply chain performance effectiveness on Sudanese manufacturing companies uses the same dimension and found that the practice has significant impact on supply chain performance.

4.2.4 Factors affecting Supply Chain Management

Table 4.7 Challenges faced by the Supply Chain Management

S. N	Variables	Mean	Std.Dev
1	***Monotonous Supply Chain Operating Rule***		
	There is a challenge in product distribution channels	3.84	1.214
	There is packaging, labeling and certification challenges	3.72	1.134
	There is discouraging and monotonous bureaucracy in my supply chain	4.32	.968
	There is high initial cost	3.49	1.397
	Overall Mean	**3.84**	
2	***Lack of Supply Chain Assets***		
	There is no suitable road infrastructures to access my supplier	4.02	1.068

	There is no internet infrastructure to ease for my transaction	4.30	.890
	There is no available warehouse at marketplaces and Food Hubs	4.38	.844
	Finding trucks to transport the goods from my suppliers is a challenge.	3.67	1.287
	Overall Mean	**4.09**	
3	***Scarcity of Supply Chain Resources***		
	There is no skilled manpower in my supply chain	3.70	1.155
	The customers are not loyal in my supply chain	3.19	1.435
	My supply chain suppliers are not trustworthy	3.76	1.115
	There is no established standard that ensure healthy and safety of the society	2.18	1.143
	Overall Mean	**3.20**	
4	***Poor Supply Chain Network***		
	There is no cooperation among my supply chain actors.	4.36	.937
	There is no shared interest across my supply chain	3.64	1.184
	The communication network in my supply chain is not clear	4.20	.947
	There is no coordination to share information and resources	4.52	.762
	Overall Mean	**4.17**	
5	***Poor Regulation Compliance***		
	There is no supporting public procurement policy in my supply chain	3.21	1.475
	The regulatory body framework is disabling the supply chain.	4.61	.742
	There are no government incentives for my supply chain business	2.52	1.175
	Government did not have facilitative policy to access to finance	3.49	1.305
	Overall Mean	**3.45**	
6	***Lack Information Technology***		
	Data is not accessible for market and product information	4.07	1.075
	There is no online and e-commerce facilities in my supply chain	3.73	1.294
	There are no smart technologies to ease transaction	3.63	1.098
	There is no digital communication and information asymmetry in my supply chain.	4.28	1.089
	Overall Mean	**3.92**	

Source: survey (2022) SPSS output

Table 4.8 Summary of Supply Chain Challenges

Supply Chain Challenges	***Mean***	***Results***
Unfavorable supply chain operating rule	3.84	High
Lack of Supply Chain Assets	4.09	Very High
Scarcity of Supply Chain resources	3.20	Moderate
Poor Supply Chain Network	4.17	High
Monotonous Regulation compliance	3.45	High
Lack of Information Technology	3.92	High

Table 4.7 depict the factors which affect the supply chain management and shows the respondents replay concerning each statement included to explain the variables in detail. The summery of the interpretation of each variable are discussed below.

- Concerning the factor related to unfavorable Supply Chain Operating Rule, with an overall mean of 3.84 and standard deviation 1.13, most respondent's high effect on the performance of the supply chain management of the organization under study. As the mean values showed, respondents are agreeing that there is a challenge in product distribution channels, packaging, labeling and certification challenges, discouraging and monotonous bureaucracy in the supply chain and high initial cost. Looking to the standard deviation values, it implies that the answers of the respondents were distributed with this value from the mean, thus the answers are concentrated around the mean.
- Concerning the factor related to Lack of Supply Chain Assets, with an overall mean of 4.09 and standard deviation 0.98, all respondents agree with the parameters stated to more explain lack of supply chain Assets has high effect on the supply chain performance. Those parameters are:
    - There are no suitable road infrastructures to access my supplier
    - There is no internet infrastructure to ease the transaction
    - There is no available warehouse at marketplaces and Food Hubs
    - Finding trucks to transport the goods from my suppliers is a challenge.
- Concerning the factor related to scarcity of Supply Chain Resources, with an overall mean of 3.20 and standard deviation 1.17, most of the respondents response is moderate depicting they don't have enough information to decided whether this factor affect the supply chain management. The respondents believe that there is established standard that ensure healthy and safety of the society with the men value of 2.18 and standard deviation of 1.14. They agree with there is no skilled manpower in the supply chain and the suppliers are not trustworthy. In addition to this, the respondents moderate whether the customers are loyal or not.

- Concerning the factor related to lack of Supply Chain Network, with an overall mean of 4.17 and standard deviation 0.91, the respondents agree that the Supply Chain Network has high effect on the supply chain management by considering the following parameters.
    - There is no cooperation among my supply chain actors.(has high effect)
    - There is no shared interest across my supply chain. (has high effect)
    - The communication network in my supply chain is not clear. (has high effect)
    - There is no coordination to share information and resources. (has very high effect)
- Concerning the factor related to Regulation Compliance, with an overall mean of 3.45 and standard deviation 1.01, the respondents could not put their firm decision on whether regulation compliance have effect on the supply chain resulting a moderate response. They believe that the regulatory body framework has high effect in disabling the supply chain with a mean of 4.61 and standard deviation of 0.74. Furthermore, they are moderate if public procurement has supporting the supply chain and the government has facilitative policy to access to finance and incentives for food supply chain management business.
- Concerning the factor related to lack of Information Technology, with an overall mean of 3.92 and standard deviation 1.09, most of the respondents believe that information technology has a big effect on the supply chain management. With the mentioned parameters, the respondents agree that data is not accessible for market and product information has high effect on performance with a mean of 4.07 and standard deviation 1.07. The supply chain management does not have online and e-commerce facilities making the process very tiresome. In addition to this, the respondents agree that there are no smart technologies to ease transaction and no digital communication and information asymmetry in the supply chain which the effect is high.

In general, except scarcity of supply chain resources which the respondents reply is moderate for the rest of parameters we can observe from data presentation that they are real challenges for Addis Ababa wholesalers and retailers of food items. The result aligns with the findings of Bayir B. *et al,* article titled, Issues and Challenges in Short Food Supply Chain: Systematic Literature Review published on sustainability in 2022. The article uses SCOR model proposed by the supply chain council (APICS)to describe, analyze and improve supply chain by providing a methodology diagnostics tools. The model considers planning, sourcing, making, delivering and return. In the review they found that supply chain business operation, Supply Chain resource, supply chain asset, regulatory compliance and information technologies are the enablers' which lack of these factors will be a challenge for the supply chain.

4.2.4 Supply Chain Performance

Table 4.9 Supply Chain Management Performance

S.N	Variables	Mean	Std.dev
1	***Efficiency***		
	How do you rate the cost of resources used	2.44	1.155
	My costs of distribution, including transportation and handling cost are	2.21	1.148
	Total cost of manufacturing, including labor, maintenance and re-work costs are	1.69	.874
	Cost associated with held inventory is	3.46	1.154
	Return on investment is high	3.05	1.139
	Overall Mean	**2.56**	
2	***Flexibility***		
	My organization ability to respond to and accommodate the periods of poor manufacturing performance such as machine beak down is	3.33	1.079
	My organization ability to respond to and accommodate the periods of poor supplier performance is	2.72	1.655
	My organization ability to respond to and accommodate the periods of poor delivery performance is	2.01	1.027
	My organization ability to respond to and accommodate new products, new markets or new competitors is	2.16	1.114
	Overall Mean	**2.55**	
3	***Quality and Safety***		
	My organization Ability to maintain production standards is	4.01	1.053
	My organization ability to maintain quality of products is	3.96	.996
	My organization has high ability to ensure Reliability of the products	4.29	1.038
	Overall Mean	**4.08**	
4	***Level Integration***		
	Frequency of contact across the supply chain is	2.12	1.163
	Risk and reward share across my supply chain actors is	2.40	1.206
	Transaction betrayal rate across the supply chain is	3.02	1.384
	level of Dependability across the supply chain is	2.19	1.289
	Overall Mean	**2.44**	

Source: survey (2022) SPSS output

Table 4.10 Summary of the Supply Chain Performance.

Performance	***Mean***	***Result Interpretation***
Efficiency	2.56	Inefficient
Flexibility	2.55	Low
Quality and safety	4.08	Good
Level of integration	2.44	Bad

- **Efficiency**

The cost of resource the supply chain using is high and make the efficiency bad with 2.44 mean ; the cost fo distribution, including transportation and handling cost is very high which result inefficiency with the mean value of 2.21 and standard deviation of 1.15; total cost of manufacturing, including labor, maintenance and rework works costs are very high which result the business to operate inefficiently with 2.21 mean value; cost associated withheld of inventory is high which also resulted inefficiency and return on investment the respondents are moderate on the parameter with mean value of 3.05.

- **Flexibility**

The respondents believe that their organization is flexible enough in responding and accommodate at the time of poor manufacturing performance with mean value of 3.33; the respondents are moderate regarding their flexibility at the time of poor supplier performance with mean value of 2.72 and standard deviation of 1.65; as for poor delivery performance the respondents believe that their organization flexibility is low with mean value of 2.01 and for flexibility in terms of new products , new market and new competitors is low with the mean value of 2.16

- **Quality and Safety**

The respondents are confident that their organization maintained product standards with mean value of 4.01; respondent is also committed to maintain the quality of the products with the mean value of 3.96 and regarding maintaining reliability of products the respondents belie vet that they have high ability and commitment with a mean value of 4.29 and standard deviation of 1.04

- **Level of Integration**

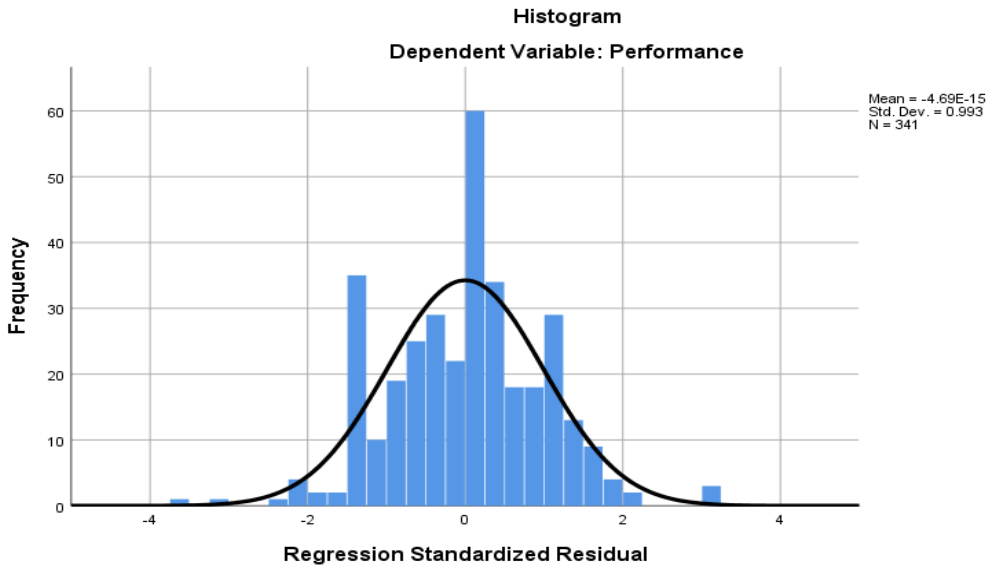
Frequency of contact across the supply chain is low with 2012 mean value; reward and risk sharing amongust supply chain actors is low with the mean value of 2.40; regarding transaction betrayal rat of the supply chain actors is moderately reflected by the respondents wth mean value of 3.02 and level of dependability is low with the mean value of 2.19.

To add up, as the summary of the performance response indicate the performance of the supply chain is very poor. The quality and safety of the product is the only parameter that the respondent replied with good. As for the other three parameters of supply chain performances the result is witnessed that it is underperformed. The reason will many ranging economics and political. We will see the factors affecting the performance in our discussion.

4.3 Testing Regression Model Assumptions

4. 3.1 Normality Assumption Test

One of the assumptions of Regression is that the sampling distribution of the Mean should be normal. To analyze the distribution of the values of dependents variables in the model associated with the independent variables, normality test of histogram is used. The histogram which is showing the shape of the distribution will depict a symmetrical, bell-shaped curve, that have the most scores will be concentrated at the middle and the rest will be distributed towards the extremes as scores drift from the center, their frequency decreases.



Source; survey (2022) SPSS output

The normality of the study is supplemented by the histogram above and the histogram of standardized residual shows a roughly normal curve when the assumption of regression and most technique met that error terms are normally distributed. The histogram showed that the assumption of normally distributed error is met.

4.3.2 Multi-Collinearity

The researcher has checked if multicollinearity problem exists or not before running the regression. Multicollinearity refers to the situation in which the independent/predictor variables are highly correlated. When independent variables are multi-collinear, there is "overlap" or sharing of predictive power. Multicollinearity can be checked using the tolerance and variance inflation factors (VIF) which are the two Collinearity diagnostics factors.

Table 4.11 Collinearity Statistic

Variable	*Tolerance*	*VIF*
Monotonous supply chain operating rule	0.798	1.454
Lack of Supply Chain Assets	0.834	1.149
Scarcity of Supply Chain resources	0.792	1.262
Poor Supply Chain Network	0.808	1.538
Poor Regulation compliance	0.829	1.372
Lack of Information Technology	0.798	1.354

Source: survey (2022) SPSS output

Tolerance is an indicator of how much of the variability of the specified independent variable is not explained by the other independent variables in the model and is calculated for each variable. If this value is very small (less than 0.10), it indicates that the multiple correlation with other variables is very high, suggesting the possibility of multicollinearity.

Accordingly, the tolerance value for all independent variables is greater than 0.1, which implies that there is no multi collinearity problem in connection with tolerance. Variance Inflation Factor (VIF) which calculates the influence of correlations among independent variables on the precision of regression estimates. The VIF factor should not exceed 10 and should ideally be close to one. As per the above table for all independent variables VIF value is less than 10 and literally closer to one, which implies there is no multicollinearity problem.

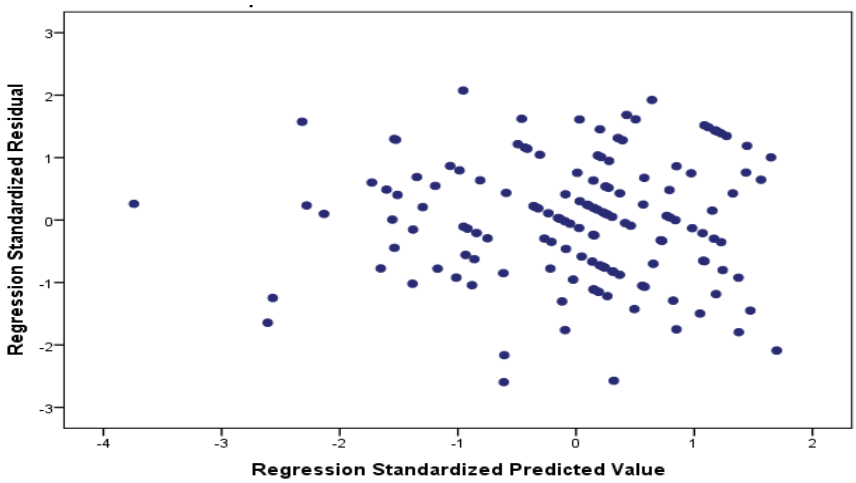
4.3.3 Homoscedasticity

A sequence of random variables is homoscedasticity. If all its random variables have the same finite variance. This is also known as homogeneity of variance. The complementary notion is called

heteroscedasticity. The misconception with the ambiguousness with homoscedasticity and heteroscedasticity results in unbiased but inefficient point estimates and in biased

estimates of standard errors and may result in overestimating the goodness fit as measured by Pearson correlation coefficient.

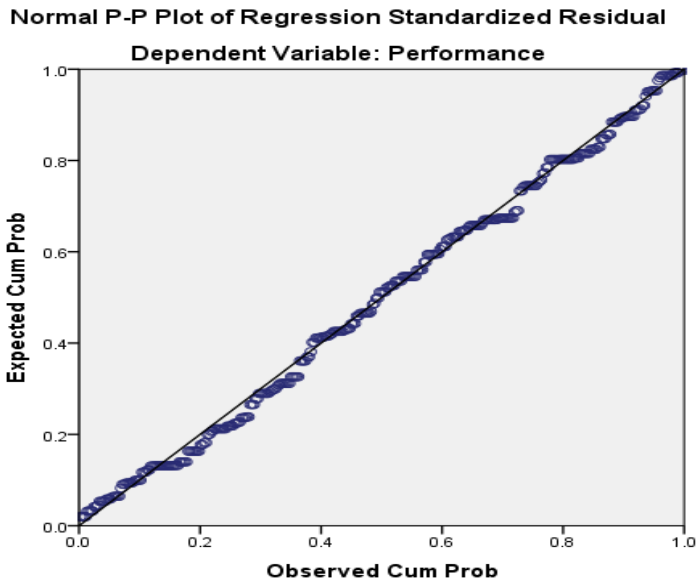
Heteroskedasticity is an organized blueprint in the errors where the variances of the errors are not constant. When the variance of the residuals is constant it is explained as homoscedasticity, which is desirable. To test for the absence of heteroscedasticity scatter plot test was used. In this test, if the scatter plot output spot appears diffused and distributed, it can be concluded that the model doesn't occur to have heteroscedasticity problem. As presented below, based on the scatterplot output above, it appears that the spots are diffused and do not form a clear specific pattern. This leads to a conclusion that the regression model doesn't have heteroscedasticity problem.



Source: survey (2022) SPSS output

4.3.4 Linearity Assumption Test

Standard multiple regression can only accurately estimate the relationship between dependent and independent variables if the relationships are linear in nature. If the relationship between independent variables (IV) and the dependent variable (DV) is not linear, the results of the regression analysis will under-estimate the true relationship. (Waters & Osborne). In order to test this assumption in this research, scatter plot is used.



Source; survey (2022) SPSS output

4.3.5 Test for Residual Has Zero Mean

Classical linear regression models assume that the error terms zero mean value. In fact, if a constant term is included in regression model equation this assumption will never be violated (brooks, 2008). In this study the researcher included the constant term in the regression equation. Therefore it‘s expected that the error terms have zero mean value and the assumption is not violated.

4.4. Correlation Analysis

Correlation describes the strength of association between variables. According to Brooks (2008), correlation analysis measures the degree of linear association between dependent and independent variable. The value of correlation coefficient ranges from -1 to1. A correlation coefficient of 1 indicates that there is perfect positive relationship between two variables; while -1 indicates that there is perfect negative relationship between two variables. On the other hand, a correlation coefficient of zero indicates no relationship between variables. As described by McDaniel and gates (2006), if the coefficient value is between 0.1and 0.29, there is poor relation, if the value is between 0.3 and 0.49, it implies there is moderate relationship and if it is >= 0.5, it shows that there is strong relation between the variables. Accordingly, as shown in the table below, the Pearson correlation coefficients for the Supply Chain Management factors and the company’s performance is computed.

Table 4.12 Correlation of Supply Chain Management and its Performance

		OR	Asset	Resource	Network	RC	IT	Performance
OR	Pearson Correlation	1						
	Sig. (2-tailed)							
Asset	Pearson Correlation	.979**	1					
	Sig. (2-tailed)	.000						
Resource	Pearson Correlation	.942**	.924**	1				
	Sig. (2-tailed)	.000	.000					
Network	Pearson Correlation	.972**	.985**	.917**	1			
	Sig. (2-tailed)	.000	.000	.000				
RC	Pearson Correlation	.964**	.942**	.964**	.942**	1		
	Sig. (2-tailed)	.000	.000	.000	.000			
IT	Pearson Correlation	.985**	.988**	.946**	.981**	.958**	1	
	Sig. (2-tailed)	.000	.000	.000	.000	.000		
Performance	Pearson Correlation	.933**	.909**	.982**	.893**	.969**	.929**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	
**. Correlation is significant at the 0.01 level (2-tailed).								

As it can be seen from the above table, it represents the correlation Matrix between the dependent and the independent variables. Based on the results, the following conclusions were drawn out.

- ***Supply Chain Operating Rule with Supply chain Performance***

  There is a strong positive correlation with a Pearson correlation coefficient of **0.933** and the significance level is 0.000, which means the relationship is highly significant. This shows that if the supply chain operating rules are well managed and executed, there will be an enhancement in the performance as well.

- ***Supply Chain Assets with Supply Chain Performance***

  There is a strong positive correlation with a Pearson correlation coefficient of **0.909** and the significance level is 0.000, which means the relationship is highly significant. This shows that if the supply chain Assets like road infrastructures, warehouses availability and finding vehicles to transport the goods from suppliers are solved, there will be an enhancement in the performance as well.

- ***Supply Chain Resources with Supply Chain Performance***

  There is a strong positive correlation with a Pearson correlation coefficient of **0.982** and the significance level is 0.000, which means the relationship is highly significant. This shows that if the supply chain resources like Skilled and professional manpower are well recruited and handled

and if the suppliers are made themselves trustworthy there will be an enhancement in the performance as well.

- ***Supply Chain Network with Supply Chain Performance***

  There is a strong positive correlation with a Pearson correlation coefficient of **0.993** and the significance level is 0.000, which means the relationship is highly significant. This is the highest amount of correlation Supply Chain Network has on Supply chain Performance from the rest of the variables that are considered in this study. This shows that if the supply chain Network like clear communication network, strong coordination to share information and resources among the supply chain actors and have a shared interest, there will be an enhancement in the performance since its effect is significant.

- ***Regulation Compliance with Supply Chain Performance***

  There is a strong positive correlation with a Pearson correlation coefficient of **0.969** and the significance level is 0.000, which means the relationship is highly significant. This shows that if the regulation compliance like having a supporting public procurement policy, government incentives for companies in this sector and facilitate a way to access finance, there will be an enhancement in the performance as well.

- ***Information Technology with Supply Chain Performance***

  There is a strong positive correlation with a Pearson correlation coefficient of **0.929** and the significance level is 0.000, which means the relationship is highly significant. This shows that if the Information technology like access to information about market and product is installed and have a digital communication system and development of online and ecommerce facilities is aided, there will be an enhancement in the performance as well.

4.5. Regression Model

Regression is a model for the relationship between a dependent variable and a collection of independent variables. It also used to model the value of a dependent scale variable based on its linear relationship or "straight line" relationship to one or more predictors. The researcher determines the relationship between a dependent variable and multiple independent variables using multiple regression analysis.

4.5.1 Model Summery

The model summary, in the table below reports the strength of relationship between the independent variables and the dependent variable. R is a Pearson correlation between predicted values and actual

values of dependent variable, with a value of 0.990, which is a very high value. While R^2 is multiple correlation coefficients that represent the amount of variance of dependent variable explained by the combination of the independent variables. According to different scholars, the R square above 0.6 is accepted, conventionally. In this study, the R square resulted is 0.980, which shows the model is so fit, and then it is highly accepted.

Table 4.13 Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.990[a]	.980	.979	.15222
a. Predictors: (Constant), lack of IT, Scarcity of Supply Resource, Unfavourable Regulation Compliance, poor Supply Network, Monotonous Operation Rule, Lack of Supply Asset				

4.5.2 Model Fitness

The NOVA tells us whether the model, overall, results is significantly good degree of prediction of the outcome variable. F-ratio is the test statistic used to decide whether the model has statistically significant predictive capability, considering the number of variables needed to achieve it. Since the significance result on the ANOVA table is 0.001 which is $p < 0.01$ and the regression mean square is greater than residual mean square with F value 68.635, the regression model fit to a very good degree of prediction.

Table 4.14 Model Fitness

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	373.223	6	52.204	68.635	.000[b]
	Residual	7.739	334	.023		
	Total	380.962	340			
a. Dependent Variable: Performance						
b. Predictors: (Constant), IT, Supply Resource, Regulation Compliance, Supply Network, Operation Rule, Supply Asset						

4.5.3 Regression Coefficients

Regression coefficients are estimates of the unknown population parameters and describe the relationship between a predictor variable and the response. In linear regression, coefficients are the values that multiply the predictor values. The following table shows the regression coefficients of the study.

Table 4.15 Factors affecting Supply Chain Management performance Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.318	.057		5.537	.000
	Monotonous supply chain operating rule	.028	.049	.030	.569	.570
	Lack of Supply Chain Assets	.360	.067	.335	5.338	.000
	Scarcity of Supply Chain resources	.629	.029	.695	21.719	.000
	Poor Supply Chain Network	-.532	.055	-.462	-9.625	.000
	Poor Regulation compliance	.471	.037	.490	12.819	.000
	Lack of Information Technology	-.102	.068	-.106	-1.505	.133

Source; survey (2022) SPSS output

From the output presented above, the unknown beta values were replaced by the values generated above. The Standardized Coefficient is used here. They represent when there is one unit of change in the independent variable there will also be a change in the dependent variable and depicts the direction of the relationship.

The mathematical model drawn from regression of the study is:

$$SCP = 0.318 + 0.030OR + 0.335SA + 0.695SR - 0.462SN + 0.490RC - 0.106IT + \mu$$

For OR = Monotonous Supply Chain Operating Rule

SA = Lack Supply Chain Assets

SR = Scarcity Supply Chain Resources

SN = Poor Supply chain Network

RC = Poor Regulation compliance

IT = Lack Information Technology

From the table we can say that α is 0.318, and this can be interpreted as meaning that if all the independent variables were to be zero, the model predicts that there can be 32% of supply Chain performance. We can also read off the value of β from the table and this value represents the slope of the regression line.

As indicated above the Coefficient of regression analysis for monotonous Supply Chain Operating Rule, Lack of Supply Chain Assets, Scarcity of Supply Chain Resources, Poor Supply chain Network, and Poor Regulation compliance showed a positive effect and the direction of the relationship of Poor Supply chain Network and Lack of Information Technology showed negative effect and statistically significant at 5% significance level. Conversely Supply Chain Operating Rule showed a positive effect but statistically insignificant and Information Technology showed a negative effect but statistically insignificant. Therefore, the effect of predictor variables on Supply Chain performance will be discussed as follows.

a) The Effect of Monotonous Supply Chain Operating Rule on Supply Chain Performance

The result of multiple regressions as illustrated in the table above revealed that operating rule has positive and statistically insignificant effect on supply chain performance with a beta value of 0.030 and p-value of 0.570 which is greater than 0.05. This implies that the effect it has on performance is not significant to make any change.

b) The Effect of Lack of Supply Chain Assets on Supply Chain Performance

Concerning supply chain assets, it has a positive and statistically significant effect on supply chin performance with performance with a beta value of 0.335 and p-value of 0.000 which is less than 0.05. This implies that, other explanatory variable remains constant, if the mean score value of supply chain asset increases by 1 unit, on average the mean score value of supply chain performance increase by 0.335 unit and statistically significant at 5% significance level.

c) The Effect of Scarce Supply Chain Resources on Supply Chain Performance

The result concerning supply chain resources showed that there is a positive effect and statistically significant effect between the DV and the IV with a beta value of 0.695 and p-value of 0.000 which is less than 0.05. This shows that supply chain resources have the highest beta value from the rest of the variables.

d) The Effect of Poor Supply Chain Network on Supply Chain Performance

When considering supply chain network, it is negatively related with performance of the company with beta value of -0.462and statistically significant with level of 0.000 which is below 0.05. This shows that leaving out other parameters, when one unit of supply chain network decreases, the performance of the companies will also be decreased by 0.462 with 5% significance level.

e) The Effect of Poor Regulation compliance on Supply Chain Performance

When considering regulation compliance, it is positively related with supply chain performance with a beta value of 0.490 and statistically significant level of 0.000 which is below 0.05. This shows that leaving out the other parameters, when one unit of regulation compliance increases, the performance of the company will improve by 0.90 with 5% significance level.

f) The Effect of Lack of Information Technology on Supply Chain Performance

When considering Information technology, it is negatively related with performance of the company with beta value of -0.106 but statistically insignificant with a level of 0.133 which is above 0.05. This shows that leaving out other parameters, when one unit of use of Information Technology decreases, the performance of the company will also be decreased by 0.106. But this effect will not have a significant effect on the supply chain performance.

Therefore, by avoiding the insignificant variable from the equation the revised regression equation will be:

$$SCP = 0.318 + 0.335SA + 0.695SR - 0.462SN + 0.490RC + \mu$$

==========

CHAPTER FIVE

FINDINGS, CONCLUSION AND RECOMMENDATIONS

This chapter presents summary, conclusion and recommendations of the study on assessment supply chain management of wholesaler and retailer of food items in Addis Ababa.

5.1 Findings

Supply chain management practices of the organization under study are analyzed in terms of customer and supplier management, supply chain integration and response speed and information sharing culture. Accordingly, the respondent replied, as there is no integration and irresponsiveness in their supply chain; there is good supplier management practice and customer management and information sharing the majority of the respondents are indifferent.

The respondents replied that there are challenging businesses operating rule, luck of supply chain assets, there is unclear and poor supply chain networks, the supply chain regulation are not suitable and there is no information technology to facilitate the supply chain management. The majority of respondents are not decide whether the there is scarcity of supply chain resource or not.

As for supply chain performance of the wholesalers and retailers of food items in Addis Ababa in terms of parameters of efficiency, flexibility, quality & safety and integration level the overall finding is worse.

All parameters of supply chain challenges are correlated with performance of the supply chain. Among others, the supply chain network and information technology are negatively correlated whereas the rest parameters are positively related with supply chain performance.

5.2 Conclusion

As several studies indicate that Ethiopia's food supply chain is described with lack of access to technology and knowledge at the farmer-level and processing level; Poor logistic infrastructure and Poor quality control mechanisms; lack of access to proper value chain financing channels and lack of focus on supply chains in the value chains and many other problems that jeopardize the supply chain. Bayir, B.; Charles, A.; Sekhari, A.; Ouzrout, Y. Issues and Challenges in Short Food Supply Chains: A Systematic Literature Review. Sustainability 2022, Found enablers and challenges of Food supply chain. Accordingly, in this paper also the above mentioned problems was proofed and in particular this research finds; wholesale and retail of food items in Addis Ababa is dominated by males and females share is very small. Females need to be giving a chance to join the business. Majority of the business

owners are married which imply the business owners are more responsible. The area needs more capital injection as the annual revenue of the majority respondents is very small and the employment opportunity the area created is small. However the level of influence on citizens' life and in micro economy is very high as it is the basic and the necessary product for human existence.

With the given parameters the supply chain practice of wholesalers and retailers of food items in Addis Ababa is traditional and is not practicing customer management and lacks integration. Supply chain of the businesses under study is fragmented which resulted poor performance. There is poor information sharing practice which makes information asymmetry and manipulated system which in turn results unfair share of business reward.

All the supply chain challenge parameters operating rule of the business area: unfavorable supply chain operating rule, unavailability of assets, scarcity of resources, poor supply chain networking, incompliance of supply chain regulations and unavailability of information technology are proofed by the majority resonant to be an existing challenges. The area needs attention to alleviate those challenges and ensure facilitative supply chain business in food wholesaler and retailer.

The stated challenges are directly affects the performance of the supply chain. In order to enhance the performance therefore, the challenges should be minimized if not resolved in short time as parts of the challenges (like changing the monotonous bureaucracy and implementing clear supply chain network) requires determination and gentility of regulatory bodies and policy makers rather than huge capital which the country cannot afford otherwise.

5.3 Recommendations

Based on the findings the researcher recommends the following to address the factors that have significant influence on the performance.

- Access the supplier road should be constructed, the telecom infrastructure should be undertaken, accessible and suitable warehouse should be constructed, more truck to transport the food items should be availed in the supply chain.
- Universities should increase producing skilled man power for the supply chain sector; advanced customer management should be implemented to increase customer loyalty; supplier relation management need also implemented in order to increase supplier trust.
- To insure healthy and safety of the society establishing standards for all food items and enhancing the quality of the service should be considered.

- Drawing a clear supply chain network is demanding. To do so all involved actors should be considered with their respected role and share of responsibility and accountability. The flow of information and product should also be mapped.
- The bureaucracy should be minimized and the response rate of the regulatory body should be increased. The policy maker should review the food supply chain especially that of the city's food supply chain policy to ensure facilitative system, arrange incentive packages, create access to finance and support with the public procurement policy.
- Besides, the gendered share of the business should be studied further to identify the very reason for uneven share of ownership and Females should be supported in different encouraging framework's to increase their share in food supply chain management. The majority of owners of the business are married which needs the policy makers to think to create young business owners into the supply chain to increase creativity and risk taking culture to develop the sector. The food supply chain demands more capital injection to increase operating capital and rewards to attract and encourage the business. Easing the requirements to access finance of the sector will help with facilitative working environment and developing clear supply chain network.
- To add up, the macro and micro economy policy makers should inculcate supply chain in the strategic plan to improve the wellbeing of the citizens as managing supply chain is all about managing cost and lead-time of the products.

5.4 suggestions for future studies

For future research studying assessment of the practices and challenges of food supply chain management system of Addis Ababa, it's will be better to include educational level of the respondents and including all actors of food supply chain. Beside it is better if the identified challenge of the Addis Ababa food supply chain is studied in detail. These enables to make sure that the output of the study can reflect the thoughts and views of all aspects of the supply chain leading to generalization. Supply chain management challenges are many in nature starting from government directives and bureaucracy. Therefore, future researches should also consider these challenges in regulatory bodies as well since they have a strong impact on successful implementation of supply chain management practice.

References

Blecken, A. (2010). Supply chain process modelling for humanitarian organizations. *International Journal of Physical Distribution & Logistics Management*, 40(8/9), pp.675–692. doi:10.1108/09600031011079328.

Aramyan, L., Oude Lansink, A., van der Vorst, J. and van Kooten, O., 2007. Performance measurement in agri-food supply chains: a case study. *Supply Chain Management: An International Journal*, 12(4), pp.304-315.

Balda, A. and Singh, R., 2020. Level of Integration among Supply Chain Members in Moving towards the Adoption of Sustainable Supply Chain Management in Ethiopian Manufacturing Industries. *American Journal of Industrial and Business Management*, 10(07), pp.1181-1205.

Bourlakis, C. and Bourlakis, M., 2005. Information technology safeguards, logistics asset specificity and fourth-party logistics network creation in the food retail chain. *Journal of Business & Industrial Marketing*, 20(2), pp.88-98.

Chick, S., Mamani, H. and Simchi-Levi, D., 2008. Supply Chain Coordination and Influenza Vaccination. *Operations Research*, 56(6), pp.1493-1506.

Chopra, S. and Meindl, P., n.d.*Supply chain management*.

Dani, S., 2016. *Food supply chain management and logistics*. [Place of publication not identified]: Kogan Page Stylus.

Dotti, A., 2012. Validation of Geant4 Releases with distributed resources. *Journal of Physics: Conference Series*, 396(3), p.032033.

Flynn, B., Huang, X. and Zhao, X., 2014. Supply Chain Management in Emerging Markets: Critical Research Issues. *Journal of Supply Chain Management*, 51(1), pp.3-4.

Grudinschi, D., Sintonen, S. and Hallikas, J., 2014. Relationship risk perception and determinants of the collaboration fluency of buyer–supplier relationships in public service procurement. *Journal of Purchasing and Supply Management*, 20(2), pp.82-91.

Handayati, Y., Simatupang, T. and Perdana, T., 2015. Value Co-creation in Agri-chains Network: An Agent-Based Simulation. *Procedia Manufacturing*, 4, pp.419-428.

Krakowiak-Bal, A., Wdowiak, W. and Ziemiańczyk, U., 2018. *Knowledge creation and solution generation methods in the design and management of rural development*. Kraków: KomisjaTechnicznejInfrastrukturyWsi PAN.

La Scalia, G., Settanni, L., Micale, R. and Enea, M., 2016. Predictive shelf life model based on RF technology for improving the management of food supply chain: A case study. *International Journal of RF Technologies*, 7(1), pp.31-42.

Wook Kim, S., 2006. Effects of supply chain management practices, integration and competition capability on performance. *Supply Chain Management: An International Journal*, 11(3), pp.241-248.

Wu, K., Liao, C., Tseng, M. and Chiu, K., 2016. Multi-attribute approach to sustainable supply chain management under uncertainty. *Industrial Management & Data Systems*, 116(4), pp.777-800.

KeneaAmentae, T., Gebresenbet, G. and Ljungberg, D., 2015. Characterizing Milk Supply and Marketing Chains and Losses in Wolmera and Ejere Districts of Ethiopia. *Journal of Service Science and Management*, 08(06), pp.823-843.

Luo, S. and Creswell, J., 2016. Designing and Developing an App for a Mixed Methods Research Design Approach. *International Journal of Designs for Learning*, 7(3).

Zhang, X. and Aramyan, L., 2009. A conceptual framework for supply chain governance. *China Agricultural Economic Review*, 1(2), pp.136-154.

Aung, M. and Chang, Y., 2014. Traceability in a food supply chain: Safety and quality perspectives. *Food Control*, 39, pp.172-184.

Bagchi, P., Chun Ha, B., Skjoett-Larsen, T. and BoegeSoerensen, L., 2005. Supply chain integration: a European survey. *The International Journal of Logistics Management*, 16(2), pp.275-294.

Belekoukias, I., Garza-Reyes, J. and Kumar, V., 2014. The impact of lean methods and tools on the operational performance of manufacturing organisations. *International Journal of Production Research*, 52(18), pp.5346-5366.

Collins, J., Worthington, W., Reyes, P. and Romero, M., 2010. Knowledge management, supply chain technologies, and firm performance. *Management Research Review*, 33(10), pp.947-960.

Ellegaard, C. and Koch, C., 2014. A model of functional integration and conflict. *International Journal of Operations & Production Management*, 34(3), pp.325-346.

Giachetti, A., 2010. *Tecnologieinformatiche e multimediali per la comunicazione e la didattica*. [Verona]: QuiEdit.

Iddris, F., Awuah, G. and Gebrekidans, D., 2016. Achieving supply chain agility through innovation capability building. *International Journal of Supply Chain and Operations Resilience*, 2(2), p.114.

Ji, G., Gunasekaran, A. and Feng, W., 2013. WITHDRAWN: The equilibrium of technological innovation in a three-level supply chain. *Journal of Engineering and Technology Management*,.

Lehoux, N., D'Amours, S. and Langevin, A., 2013. Inter-firm collaborations and supply chain coordination: review of key elements and case study. *Production Planning & Control*, 25(10), pp.858-872.

Minten, B., Tamru, S., Engida, E. and Kuma, T., 2015. Transforming Staple Food Value Chains in Africa: The Case of Teff in Ethiopia. *The Journal of Development Studies*, 52(5), pp.627-645.

Pettersson, A. and Segerstedt, A., 2014. To Evaluate Cost Savings in a Supply Chain : Two Examples from Ericsson in the Telecom Industry. *Operations and Supply Chain Management: An International Journal*, pp.94-102.

Pettersson, A. and Segerstedt, A., 2014. To Evaluate Cost Savings in a Supply Chain : Two Examples from Ericsson in the Telecom Industry. *Operations and Supply Chain Management: An International Journal*, pp.94-102.

Sila, I., Ebrahimpour, M. and Birkholz, C., 2006. Quality in supply chains: an empirical analysis. *Supply Chain Management: An International Journal*, 11(6), pp.491-502.

Villarreal, B., Garza-Reyes, J. and Kumar, V., 2016. A lean thinking and simulation-based approach for the improvement of routing operations. *Industrial Management & Data Systems*, 116(5), pp.903-925.

Cronbach, L.J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16(3),

pp.297–334. doi:10.1007/bf02310555.

Bayir, B., Charles, A., Sekhari, A. and Ouzrout, Y. (2022). Issues and Challenges in Short Food Supply Chains: A Systematic Literature Review. *Sustainability*, 14(5), p.3029. doi:10.3390/su14053029.

Carter, C.R., Ellram, L.M. and Ready, K.J. (1998). Environmental Purchasing: Benchmarking Our German Counterparts. *International Journal of Purchasing and Materials Management*, 34(3), pp.28–38. doi:10.1111/j.1745-493x.1998.tb00299.x.

Hagelaar, G.J.L.F., van der Vorst, J.G.A.J. and Marcelis, W.J. (2004). Organising Life-cycles in Supply Chains. *Greener Management International*, 2004(45), pp.26–42. doi:10.9774/gleaf.3062.2004.sp.00004.

Handfield, R.B. and Nichols, E.L. (2004). Key issues in global supply base management. *Industrial Marketing Management*, 33(1), pp.29–35. doi:10.1016/j.indmarman.2003.08.007.

Krishna, K., Ganeshan, K. and Ram, D.J. (1995). Distributed simulated annealing algorithms for job shop scheduling. *IEEE Transactions on Systems, Man, and Cybernetics*, 25(7), pp.1102–1109. doi:10.1109/21.391290.

Sarker, B.R. (2002). A review of: 'Supply Chain Management: Strategy, Planning and Operation' Sunil Chopra and Peter Meindl Prentice Hall, Inc., 2001, 457 pages, ISBN: 0-13-026465-2. *IIE Transactions*, 34(2), pp.221–222. doi:10.1080/07408170208928863.

Simchi-Levi, D. (2003). Naval Research Logistics From the Editor: David Simchi-Levi. *Naval Research Logistics*, 50(5), pp.384–387. doi:10.1002/nav.10100.

Appendix I

Questionnaires

Addis Ababa University School of Commerce
Department of Logistics and Supply chain management Graduate program.

Enablers and Challenges of food supply chain performance.
A Study on Wholesalers and Retailers in Addis Ababa, ETHIOPIA

Dear Sir/Madam,

My Name is Shimelis Hayilemeskel; MA Candidate-Logistics and Supply Chain Management, Addis Ababa University, School of Commerce. I am conducting a thesis in **challenges and enablers of food supply chain performance** for partial fulfillment of my graduation degree.

The survey examines various aspects of supply chain management practices in an organization. Your participation is critical to the success of the study. All responses will be kept confidential and will not traceable to individual respondent. There are no rights or wrong answer to the questions. The study is only interested in your assessment of your organization's activities.

You will be asked questions concerning the company's current business practice. If you are unable to complete the questionnaire yourself, please entrust the task to another who is knowledgeable about supply chain management. The questionnaire will take about 20 minutes to complete. Kindly spare a few minutes from your busy schedule to complete the questionnaire for easy of the study.

Once you have completed the questionnaire, please email it directly to me using shimelis.haile12@gmail.com. Thank you in advance for your cooperation and incase of enquiry, please do not hesitate to contact the undersigned.

Shimelis Hayilemeskel
MA Candidate-Logistics and Supply Chain Management,
Addis Ababa University, School of Commerce
Tel:+251-0911-786993
Email:shimelis.haile12@gmail.com
Addis Ababa, Ethiopia.

SECTION1: SUPPLY CHAIN MANAGEMENT PRACTICES

The following questions are about how **your organization's supply chain practice.**

Please indicate your level of agreement on the following statements based on your experience working in your organization. The rating is from 1=Strongly Disagreeto5= Strongly Agree

		1	2	3	4	5
	i. Customer Management					
SPC1	My organization frequently interacts with customers to set its reliability, responsiveness, and other standards	□1	□2	□3	□4	□5
SPC2	My organization's goods are stored at appropriate distribution points close to customers in the supply chain.	□1	□2	□3	□4	□5
SPC3	My organization frequently measures and evaluates customer satisfaction	□1	□2	□3	□4	□5
SPC4	My organization has frequent follow-up with its customers for feedback	□1	□2	□3	□4	□5
	ii. Supplier Management					
SPS1	My organization helps its suppliers to improve their product quality	□1	□2	□3	□4	□5
SPS2	My organization has continuous improvement programs to establish long lasting relation with its suppliers	□1	□2	□3	□4	□5
SPS3	My organization regularly solve problems jointly with its suppliers	□1	□2	□3	□4	□5
SPS4	My organization rely on few dependable supplier					
	iii. Supply Chain Integration					
SPI1	My supply chain members have common agreed goals for supply chain development	□1	□2	□3	□4	□5
SPI2	My supply chain members clearly defines roles and responsibilities of each other cooperatively	□1	□2	□3	□4	□5
SPI3	Firms in my supply chain create compatible communication and information system	□1	□2	□3	□4	□5
SPI4	There is fair risks and rewards share across my supply chain members.	□1	□2	□3	□4	□5
	iv. Speed of Responsiveness					
SPR1	My organization operation system is well address changes in customer demand	□1	□2	□3	□4	□5
SPR2	My organization logistics satisfy customer demand	□1	□2	□3	□4	□5
SPR3	My organization use information technology to trace and respond fast. formation flow across your su	□1	□2	□3	□4	□5
SPR4	Actors in my Supply chain are flexible to meet customer requirement.	□1	□2	□3	□4	□5
	v. Information Sharing					
PIT1	My organization use Information Technology to manage its supply chain	□1	□2	□3	□4	□5
PIT2	The supply chain is smart integrated so that information is shared across all actors.	□1	□2	□3	□4	□5
PIT3	Relevant data can be accessed across the supply chain actors to forecast demand, to manage inventory and track status	□1	□2	□3	□4	□5

SECTION2: SUPPLY CHAIN PERFORMANCE

The following questions are about how **your organization's supply chain has been performing in comparison to other organizations.** ***Please indicate the performance level of your firm's supply chain in comparison to other firms in the Food Supply.***
The rating is from1= extremely Worse to 5=extremely Better

Code		1	2	3	4	5
	i. Efficiency					
PE1	How do you rate the cost of resources used	□1	□2	□3	□4	□5
PE2	My costs of distribution, including transportation and handling cost are.	□1	□2	□3	□4	□5
PE3	Total cost of manufacturing, including labor, maintenance and re-work costs are	□1	□2	□3	□4	□5
PE4	Cost associated with held inventory is	□1	□2	□3	□4	□5
PE5	Return on investment is	□1	□2	□3	□4	□5
	ii. Flexibility					
PF1	My organization ability to respond to and accommodate the periods of poor manufacturing performance such as machine beak down is high.	□1	□2	□3	□4	□5
PF2	My organization ability to respond to and accommodate the periods of poor supplier performance is high	□1	□2	□3	□4	□5
PF3	My organization ability to respond to and accommodate the periods of poor delivery performance is high	□1	□2	□3	□4	□5
PF4	My organization ability to respond to and accommodate new products, new markets or new competitors is high.	□1	□2	□3	□4	□5
	iii. Quality and Safety					
PQ1	My organization Ability to maintain production standards is very high	□1	□2	□3	□4	□5
PQ2	My organization ability to maintain quality of products is high	□1	□2	□3	□4	□5
PQ3	My organization has high ability to ensure Reliability of the products	□1	□2	□3	□4	□5
	iv. Level Integration					
PL1	Frequency of contact across the supply chain is high	□1	□2	□3	□4	□5
PL2	Risk and reward share across my supply chain actors is	□1	□2	□3	□4	□5
PL3	Transaction betrayal rate across the supply chain is	□1	□2	□3	□4	□5
PL4	level of Dependability across the supply chain is	□1	□2	□3	□4	□5

The following questions are about enablers of the supply chain. Kindly indicate the level to your organization's supply chain.

SECTION3: ENABLERS OF SUPPLY CHAIN PERFORMANCE

Please indicate your level of agreement on the following statements based on your experience working in your organization. The rating is from1=Strongly Disagree***to5=Strongly Agree***

Code		1	2	3	4	5
	i. Consideration as Value Chain					
ENV1	All entities along the value chain aspire to move up to increase their share of return.	□1	□2	□3	□4	□5
ENV2	The stakeholder's network involved in the value chain is clearly stated.	□1	□2	□3	□4	□5
ENV3	All entities in the value chain are responsible to add value on the supply chain	□1	□2	□3	□4	□5
	ii. Legislation					
ENLL1	The regulatory body efficiently controlling products to ensure safety and health of the society	□1	□2	□3	□4	□5
ENL2	The regulatory body have competent technology to ensure labelling and treatability. trace	□1	□2	□3	□4	□5
ENL3	There is supportive policy to create facilitative supply chain environment	□1	□2	□3	□4	□5
	iii. Consumer Choice					
ENC1	Your organization has suitable packaging.	□1	□2	□3	□4	□5
ENC2	The customer demand is shifted to processed food.	□1	□2	□3	□4	□5
ENC3	Your products have enough demand	□1	□2	□3	□4	□5
	iv. Sustainability					
ENS1	There is energy wastage in your organization	□1	□2	□3	□4	□5
ENS2	Your organization has waste management policy	□1	□2	□3	□4	□5
ENS3	Your organization has sustainable economy	□1	□2	□3	□4	□5
	v. Collaboration					
ENB1	There is clear end-to-end collaborative platform across the value chain	□1	□2	□3	□4	□5
ENB2	All entities across the value chain exchange information on time	□1	□2	□3	□4	□5
ENB3	Your organization has continuous improvement program that include other entities in the value chain.	□1	□2	□3	□4	□5

The following questions are about how **your organization's supply chain challenges.**
Kindly indicate the level of challenges of your organization's supply chain.

SECTION4: CHALLENGES OF SUPPLY CHAIN

Please indicate the challenge level of your firm's supply chain.

The rating isfrom1= Extremely Disagree to 5=Extremely Agree

Code		1	2	3	4	5
	i. Monotonous Supply Chain Operating Rule					
COP1	There is a challenge in product distribution channels	□1	□2	□3	□4	□5
COP2	There is packaging, labeling and certification challenges	□1	□2	□3	□4	□5
COP3	There is discouraging and monotonous bureaucracy in my supply chain	□1	□2	□3	□4	□5
COP4	There is high initial cost	□1	□2	□3	□4	□5
	ii. Lack of Supply Chain Asset					
CSA1	There is no suitable road infrastructures to access my supplier	□1	□2	□3	□4	□5
CSA2	There is no internet infrastructure to ease for my transaction	□1	□2	□3	□4	□5
CSA3	There is no available warehouse at market places and Food Hubs	□1	□2	□3	□4	□5
CSA4	Finding trucks to transport the goods from my suppliers is a challenge.	□1	□2	□3	□4	□5
	iii. Scarcity of Supply Chain Resources					
CCR1	There is no skilled man power in my supply chain	□1	□2	□3	□4	□5
CCR2	The customers are not loyal in my supply chain	□1	□2	□3	□4	□5
CCR3	My supply chain suppliers are not trustworthy	□1	□2	□3	□4	□5
CCR4	There is no established standard that ensure healthy and safety of the society	□1	□2	□3	□4	□5
	iv. Poor Supply chain Network					
CSN1	There is no cooperation among my supply chain actors.	□1	□2	□3	□4	□5
CSN2	There is no shared interest across my supply chain	□1	□2	□3	□4	□5
CSN3	The communication network in my supply chain is not clear	□1	□2	□3	□4	□5
CSN4	There is no coordination to share information and resources	□1	□2	□3	□4	□5
	v. Lack of Regulation compliance					
CRC1	There is no supporting public procurement policy in my supply chain	□1	□2	□3	□4	□5

CRC2	The regulatory body frame work is disabling the supply chain.	□1	□2	□3	□4	□5
CRC3	There are no government incentives for my supply chain business.	□1	□2	□3	□4	□5
CRC4	Government did not have facilitative policy to access to finance	□1	□2	□3	□4	□5
	vi. Unavailability of Information technology					
CIT1	Data is not accessible for market and product information	□1	□2	□3	□4	□5
CIT2	There is no online and e-commerce facilities in my supply chain	□1	□2	□3	□4	□5
CIT3	There are no smart technologies to ease transaction	□1	□2	□3	□4	□5
CIT4	There is no digital communication and information asymmetry in my supply chain.	□1	□2	□3	□4	□5

The following questions are about **demographic profile of your organization.** Kindly identify the appropriate characteristics of your organization or firm.

SECTION4:DEMOGRAPHIC PROFILE	
Pleasetick(✓)attheappropriatebox/columnorwriteinyouranswerswhere appropriate	
D1.BusinessDescriptionof Organization: □ Wholesaler □ Retailer □ Whole saler & Retailer □ Processer and Wholesaler Others. Please specify: _____	**D2.NumbersofEmployees:** □ Less than 50 □ 50-100 □ 101-250 □ 251-500 □ Morethan501
D3.Annualsalesofyourorganization is: □ Less than500,000 □ 500,001–1million □ 1,000,001 5million □ 5,000,001-10million □ 10,000,001 – 50 million □ More than 50 million **D5. Gender Information** sex of Business owner □ Male □ Female	**D4.Yearsofoperatingexperienceofyourcompany:** □ Less than 1year □ 1–5years □ 5–10years □ 10–15 years □ 15–20 years □ Morethan20 years **D6. Marital status of Business owner** □single □Married □widow □Divorce

END OF THE QUESTIONNAIRE
THANK YOU FOR YOUR CO-OPERATION

If you have problems in completing this questionnaire, please do not hesitate to contact **ShimelisHayilemeskel**at0911**-786993.**

Kindly return duly completed form by email to ***shimelis.haile12@gmail.com*** telegram, WhatsApp or call me *@0911-786993 and I will collect from your office or from your convenient place.*

Thank you for your valuable input and kind cooperation.

As a token of our appreciation for your kind assistance, we would like to send you a copy of the findings of this study. Could you please provide us with your address or enclose your Business card.

Mailto _____

_____

_____

This is the end.
Your kind participation is much appreciated
Thank you.