



**ADDIS ABABA UNIVERSITY**

**SCHOOL OF COMMERCE**

**DEPARTMENT OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT**

**ANALYSIS OF THE PERFORMANCE OF HORTICULTURAL  
EXPORTERS IN ETHIOPIA: A LOGISTICS PERSPECTIVE**

**By: Estifanos Fikru**

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**Advisor: Busha Temesgen (Ph.D)**

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**Department of business and Economics**

**Analysis of the performance of horticultural exporters  
in Ethiopia: A logistics perspective**

**By: Estifanos Fikru**

**Approved by the Examining Board**

**Dr. Busha Temesgaen**  
Advisor

\_\_\_\_\_  
Signature

**Dr. Tariku Jebena**  
Internal examiner

\_\_\_\_\_  
Signature

**Dr. Asmamaw Argeta**  
External Examiner

\_\_\_\_\_  
Signature

## DECLARATION

I declare that this thesis entitled “**Analysis of the performance of horticultural exporters in Ethiopia: A logistics perspective**” is my original work. I declare that this thesis has been composed by myself and that it has not been submitted in any previous application for a degree.

**Candidate:**

**Name:** ESTIFANOS FIKRU

**Signature** \_\_\_\_\_

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## **List of Acronyms**

EHPEA - Ethiopian Horticulture Producer Exporters Association

FDI- Foreign Direct Investment

GAP- Good Agricultural Practice

LDC – Least Developed Countries

MRL- Maximum Residue Level

MRP – Materials requirement planning

SEDEX – The supplier ethical data exchange

SME – Small and medium enterprise

UNCTAD - United Nations Conference on Trade and Development

USAID – United States Agency for International Development

## *ABSTRACT*

*The central focus of this study was to find out the effect of logistics activities on the export performance of the horticultural exporters. The study attempted to see the extent to which logistical activities are affecting the horticultural export industry. It has tried to find out good and poor practices of logistical activities in the horticultural export sector in Ethiopia. In the literature review, various books were consulted on the theoretical aspect. Each of the main logistical activities were explained in the theoretical literature review. As there were fewer researches conducted in the topic in relation to Ethiopian context, a limited number of related researches were taken as an example. The research method that was utilized in this study was qualitative by using in-depth interviews. Most of the respondents were experts, owners and managers who were operating in the industry for over a decade. In order to make the study complete and representative of all the sub-sectors, interviewees were selected from flower, vegetable and fruit exporters. An expert from the Horticulture exporters association was also involved in the interview. There were a significant improvement in Ethiopia in facilitating logistical activities. Even though, the horticulture export industry is small and young compared to other countries actively working in the industry, significant problems in the industry persist. Some of the highlighted problems in the industry were a lack of good quality packaging materials, lack of local agro-chemical suppliers and significantly high raw material prices. Other issue raised were lack of spare-parts necessary to maintain cooling systems along with qualified personnel, lack of reliable electricity supply in the country and limited flight to Amsterdam. Incapacitated state institutes running the horticultural industry were also one of the major problem highlighted by few interviewees.*

**Key words:** Horticulture, Logistics, Performance, Floriculture, Export, Industry, Farm, Transport

# CHAPTER ONE

## INTRODUCTION

This chapter deals with background of the study, statement of the problem, research question, objectives of the study, significance of the study, scope of the study, and organization of the thesis.

### **1.1 Background of the Study**

Growth potential is strong for the production of horticultural commodities in underdeveloped and emerging-economy countries of the world. Development of horticultural crop production promises to provide these countries with the ability to meet domestic food needs and diversify income sources. In addition, horticulture affords excellent opportunities for improvement of human health, and farmer household economic and social advancement. Horticulture commodities are ideally suited to accomplish these objectives because of their high economic and nutritive value, and because they can often serve as an engine for agricultural and economic diversification. (USAID, 2005)

In the past two decades, exports of horticultural products (including fruits, vegetables and cut-flowers) from developing countries have increased tremendously. Horticultural exports from Latin-America more than tripled in the past 20 years, and horticultural exports from Africa and Asia more than quadrupled. This tremendous growth has resulted in horticulture being the most important product category in total agricultural food exports for all developing regions. (Broeck G and Moerthens M, 2016)

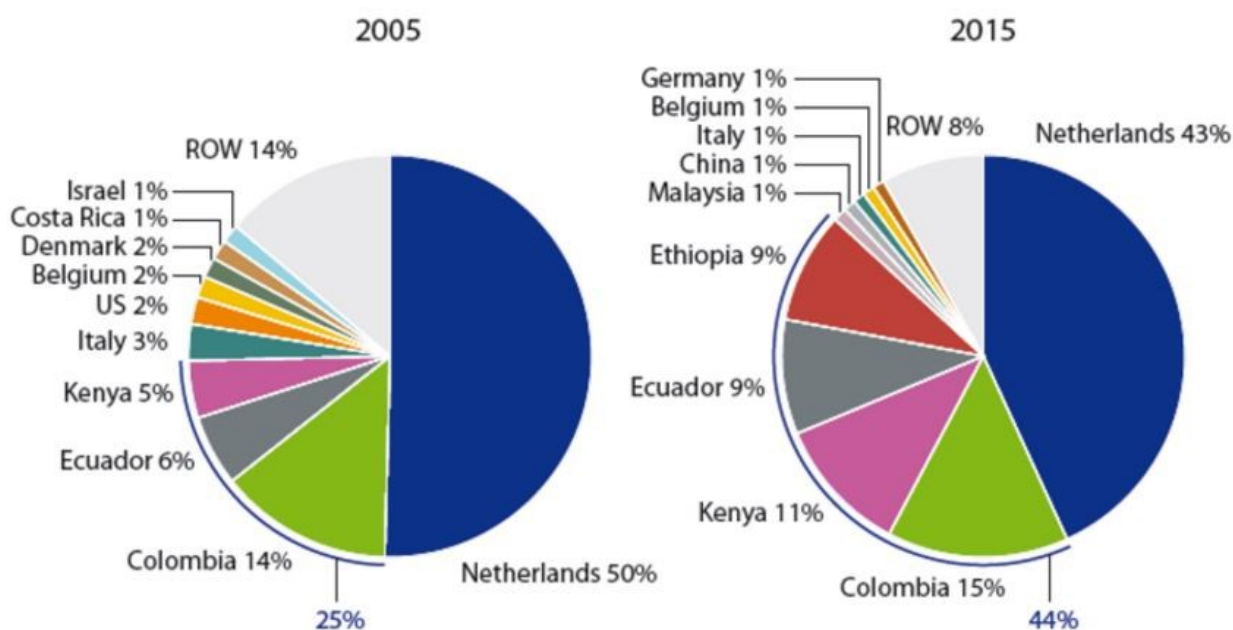
According to EHPEA, currently, there are 126 investments in Ethiopia in the export of flower, fruits, vegetables and herbs. Farm ownership is made up of local investors(46), direct foreign investors(76), joint venture partnership(3) and development bank(1). Currently, the flower, fruit,

vegetable and herb farms occupy 10,897.21 hectares. The sector provides employment opportunity for 199,640 persons (EHPEA, 2019). All the 126 investments are not in operation right now.

HS Code	Products	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18*
08039000	Banana, fresh	-	-	4,216	6,854	9,086	7,722	6,133
08031000	Plantains	-	-	2,384	3,583	3,691	4,797	5,950
08051000	Oranges, fresh or dried	3,298	3,062	3,331	3,008	2,176	2,256	1,576
08045000	Guavas, mangoes and mangosteens, fresh or dried	1,705	2,021	2,175	2,339	2,047	2,186	1,412
08055000	Lemons (Citrus Limon , Citrus Limonum) and Limes (Citrus Aurantifolia, Citrus)	1,072	1,096	980	909	1,149	1,032	966
08072000	Papaws (papayas), fresh	464	567	692	841	1,089	970	1,142
08101000	Strawberries, fresh	748	579	741	464	602	636	766
08071100	Watermelons, fresh	32	40	64	83	84	554	458
08044000	Avocados, fresh or dried	9	9	3	7	40	191	648
	Sub-Total	7,328	7,372	14,588	18,088	19,964	20,344	19,050
	Others	5,503	7,678	4,125	463	340	901	399
	<b>Grand Total</b>	<b>12,831</b>	<b>15,050</b>	<b>18,713</b>	<b>18,551</b>	<b>20,304</b>	<b>21,245</b>	<b>19,449</b>

Source: Global Agriculture information network, Fruit Export Ethiopia 2011-2018

Ethiopia has a lot of potential to produce and export Horticultural products. From the horticultural sector the flower export sector holds the lion's share. Export of fruit, vegetable and herbs is also growing. Ethiopia was not a major flower exporter in 2005 but it controlled about 9% of the export market in 2015. The following pie chart illustrates Ethiopia's position. Source: International trade centre



World's largest cut flower export countries, 2005 vs 2015.

Ethiopia has generated \$261 million from the export of flowers and the remaining \$57 million was secured from vegetables, fruit and herbs export. The export of Ethiopia's horticulture products has been increasing steadily from time to time and especially the flower sector takes the lion's share in generating huge amount of the foreign currency. Netherlands, Saudi Arabia, UK, USA, Japan, Norway, Germany, UAE, Belgium and Italy were the main export destinations of Ethiopian horticulture products. More than 100 companies have been engaged in cultivation of flowers, fruit and vegetables as well as herbs and supplying high quality products to the international market (Newbsiness Ethiopia 2019).

Logistical activities include transportation, warehousing, industrial packaging, materials handling, inventory control, order fulfilment, demand forecasting, production planning, procurement, customer service, facility location, return goods handling, parts and service support and scrap disposal. Some organizations with well developed logistics departments might not place responsibility for all of these activities within the logistics area. However, decisions regarding these areas must utilize the systems view that is crucial to logistics management (John et al. 2013).

This research will be dealing with how the twelve major logistics activities, mentioned above impact the logistics performance of the horticulture industry. Most of the researches made in Ethiopia or elsewhere in the world focus on problems associated with transportation and warehousing (cold chain) issues related mostly to the floriculture industry. However, logistics does not mean transport or warehouse only and a study focusing on floriculture, which is only one sector of the horticulture industry, cannot represent the whole horticulture industry.

Horticulture products share many similar characteristics. They are easily perishable, they are not durable, they have similar destination markets and so on. Despite such similarities, they were not studied as one group under horticulture industry. More emphasis was given to the flower industry.

Most of the horticulture researches were also made outside of Ethiopia and those made in Ethiopia were not mostly focusing on logistics.

## **1.2 Statement of the Problem**

The horticulture industry has many challenges in relation to the logistical activities despite it being one of the most successful sectors in earning a foreign currency for Ethiopia. Although there is much improvement in the road infrastructure, the quality of the asphalt and gravel roads is poor in some parts of the country.

Exporters are allowed to import refrigerated trucks duty free but it is only for one time. As their trucks are old it is affecting their performance. When horticultural products are transported, it should be in a refrigerated container in order to keep the products from damage. Usage of old and damaged vehicles is also a challenge in the efficient and effective operation of horticultural export. There are also few companies which provide transport service using refrigerated trucks unless the exporters use their own vehicles. The nature of horticultural products make them vulnerable for damage. Their shelf life is short that due attention should be made in avoiding wastage in the transportation and warehousing of these products.

Packaging materials are not widely available. They are mostly imported and there are a limited number of organizations engaged in the production of these materials. Packaging is crucial in minimizing damage to horticultural products. It has a great role in minimizing damage to the product during transportation. Packaging also plays a role in the efficient utilization of warehouse space. Packaging design should also be aligned with the material handling equipment. Lack of packaging materials in Ethiopia has forced almost all exporters to import their packaging supplies from abroad. The lead time to import these packaging materials is longer than there are circumstances where it is difficult to export their produce on time.

Materials handling equipment are also important in reducing labour force requirement, in handling the products safely, in the swift transport of products to and from warehouses and also to the export market. Even though, there is a cheap labor to do much of the work manually, there is a need to use material handling equipment to increase efficiency.

Inventory levels are high as the lead time to import supplies is longer. This is creating unnecessary stockpile of chemicals and fertilizers. It is also impacting the cash flow of the organizations by tying up their capital in the inventory. Moreover, there is a higher chance that these chemicals expire as they are stored for a long time as a contingency plan.

Order fulfillment is being affected due to permits being invoked because the permits serve only for the specific dates in a month. Documents sometimes are misplaced by Ethiopian Airlines. This affects the order fulfillment process.

The horticultural export sector should be responsive in meeting the demand of international market. For this reason, competitors activities should be better monitored. The forecasting accuracy of horticultural exporters shows some deviation from actual demand even if it is hard to make forecasts in the industry.

Optimum level of production has not been maintained. Farms are producing at 75% of their capacity or less. There is a lack of procedures to evaluate customer satisfaction in most organizations. There is a language barrier to properly address customer requests and feedback.

Production site and warehouse site location is important as time and location change impacts cost of products. Decision regarding facility location impacts transportation cost, horticultural products quality, and inventory requirements among other things. Even though, most farms are located near

to the airport there are no highways linking the farms to the airport that trucks spend a significant time on the road carrying perishable agricultural produce.

Unless the problems associated with the export of horticultural products is not addressed properly, it could be difficult for the country to compete in the international market. Therefore, a thorough instigation of the problems mentioned above should be done.

Most of the researches made related to horticultural export sector focus mainly on the export of flowers. Moreover, the main research areas focus on cold-chain problems related to warehousing/pack-house and transportation.

### **1.3 Research Questions**

**This study tried to address the following research questions:**

What is the relationship between horticultural export performance and logistical activities?

What are the most important logistical activities in horticultural export?

How effective are logistics activities in the horticultural sector compared to other countries?

What are the trends in global horticultural export?

How have some logistics activities changed in the horticulture export sector in the past few years?

What can be done to improve the efficiency of logistics activities in the horticultural export sector?

### **1.4 Research Objectives**

#### **General objectives**

The general objective is to identify the effect of logistics activities on the performance of horticultural exporters in relation to transportation, warehousing, industrial packaging, materials handling, inventory control, order fulfilment, demand forecasting, production planning, procurement, customer service, facility location, and scrap disposal.

## **Specific objectives**

To differentiate the most important logistical activities in horticultural export.

To compare the effectiveness of logistics activities in the horticultural sector with other countries.

To investigate the trends in global horticultural export.

To discuss some of the changes in horticultural export sector in recent years.

To recommend improvements that need to be made in horticultural logistics.

## **1.5 Significance of the Study**

The study will be beneficial for managers, investors, employees and other stake holders who would like to engage in the export of horticultural products. The study could also open door for further research. The research could shade light on previously ignored functions which were thought of as inferior activities. The research may serve as a future reference for new researchers on the subject of logistics functions.

## **1.6 Scope of the Study**

The study doesn't incorporate logistical activities related to the production and movement of horticultural products for the local consumption. The research doesn't include organizations which are not engaged the export sector. The study's focus was on the main logistics activities related to the horticultural export sector which are transportation, warehousing, industrial packaging, materials handling, inventory control, order fulfilment, demand forecasting, production planning, procurement, customer service, facility location, and scrap disposal. The study was on the export of horticultural products that pass through bole international airport. The study doesn't consider the export of horticultural products through borders to neighbouring countries. The study was conducted based on active horticultural exporters in the year 2020. The geographical scope of the study is within Ethiopia.

## **1.7 Limitations of the study**

While doing the research there were some problems. Due to COVID19, many organizations were not welcoming visitors that the researcher was forced to search for participants who are willing to open their doors for the interview. Some organization workers were working from home that it was difficult to meet with them in person. Focus-group discussion was planned to give another dimension for the research but it was difficult to organize such meetings due to the pandemic.

## **1.8 Organization of the Study**

This research paper has five chapters. The first chapter is Introduction which contains background of the study, statement of the problem, Research Questions, objectives of the study, Scope of the study, Significance of the study, Limitations of the Study and organization of the study. The second chapter deals with literature review, in which both theoretical and empirical literature work in the research topic is presented. The third chapter discusses the methodology utilized to conduct the research. These are, methods of data Analysis, data Source and methods of data collection and method of data analysis. Chapter four provides the finding of the study. The fifth chapter presents conclusions, and recommendations.

## **CHAPTER TWO**

### **REVIEW OF RELATED LITERATURE**

In this chapter the researcher focuses on theoretical review, empirical review, and conceptual framework of the study.

#### **2.1. Theoretical review**

Logistical activities include transportation, warehousing, industrial packaging, materials handling inventory control, order fulfilment, demand forecasting, production planning, procurement, customer service, facility location, return goods handling, parts and service support and scrap disposal. Some organizations with well developed logistics departments might not place responsibility for all of these activities within the logistics area. However, decisions regarding these areas must utilize the systems view that is crucial to logistics management (John et al. 2013).

#### **Overview of Logistic Management**

##### **2.1.1 Transport**

Transport inefficiencies can greatly impact the performance of horticultural exporters. Transportation is a very important activity in the logistics system and is often the largest variable logistics cost. A major focus in Logistics is on the physical movement or flow of goods and on the network that moves the product (John, Et al 2013).

Transportation provides desired changes in location. It allows the cultivating of a produce in areas particularly adapted to their production and then moving them to the buyers. However, the long distances over which a produce are transported often results in relatively high transportation costs and potentially lower quality, due to the damage during transport if the products are not properly packed. One of the issues for the floriculture industry in Ethiopia is the weakness of the

international and the domestic transportation system although it shows significant improvement. (Janko A and Alemu G, 2014).

One of the central problems of supply chain management is the coordination of product and material flows between locations. A typical problem involves bringing products located at a central facility to geographically dispersed facilities at minimum cost. For example, the product supply is located at a plant, warehouse, cross-docking facility or distribution Centre and must be distributed to customers or retailers. The task is often performed by a fleet of vehicles under the direct control, or not, of the firm(Lourenco, 2005).

Transportation is an area that absorbs a significant amount of the cost in most firms. Therefore, methods for dealing with the important issues in transportation, such as mode selection, carrier routing, vehicle scheduling and shipment consolidations are needed in most companies. One important aspect in transportation management is coordination with the remaining activities in the firm, especially within warehouse and customer service. In some cases transport is the last contact with the customer and companies should therefore take care to meet the customer expectations. The transport coordination within the different elements of a supply chain, involving different companies, can be of great strategic importance, since all of them most likely benefit by offering fast delivery to a specific customer. The legal constraints relate to working hours, speed limits, regulations governing vehicle construction and use, restrictions for unloading and so on. With the growth in Internet sales, this problem is gaining momentum, since delivery times are usually very short, customers can be dispersed in a region, every day there is a different set of customers and with very short product delivery time -windows (Lourenco, 2005).

### **2.1.2 Warehousing/ Store**

Warehousing can affect the performance of horticultural exports significantly. Warehousing decisions can affect the performance of logistics activities. The second area which has a trade off relationship with transportation, is storage. A number of important decisions are related to storage

activities, including how many warehouses, how much inventory, where to locate the warehouse, what size the warehouse should be and so on (John et al. 2013).

Warehousing is an integral part of every logistics system and plays a vital role in providing a desired level of customer service. Warehousing can be defined as the part of a supply chain that stores products (raw materials, parts, work-in-process and finished goods) at and between points of production and points of consumption, and also provides information to management on the status and disposition of items being stored. The basic operations at a warehouse are receiving, storage-handling, order picking, consolidation – sorting and shipping. The main objectives are to minimize product handling and movement and store operations as well as maximize the flexibility of operations (Lourenco, 2005).

### **2.1.3 Packaging**

A third area of interest to logistics is industrial (exterior) packaging. Industrial packaging protects the product during transportation and storage and includes materials such as corrugated (cardboard boxes), stretch wrap, banding, bags, and so on. The type of transportation mode selected affects packaging requirements (John et. Al, 2013).

### **2.1.4 Materials handling**

A fourth area to be considered is materials handling, which is also of interest to other areas in a typical manufacturing organization. Materials handling is important in warehouse design and efficient warehouse operations. Logistics managers are concerned with the movement of goods into a warehouse, and the movement of goods from storage to order-picking areas and eventually to dock areas for transportation out of the warehouse. Materials handling is concerned with mechanical equipment used for short distance movement and includes equipment such as conveyors, forklift trucks, overhead cranes, and automated storage and retrieval systems. Production managers may want a particular pallet, or container type that is not compatible with

logistics warehousing activities. Therefore, the materials handling design must be coordinated in order to ensure congruity between the types of equipment used and the storage devices they are moving (John et al, 2013).

### **2.1.5 Inventory control**

Inventory control can play a big role in logistics performance and consequently in export performance. Managers must decide whether they need additional products in a given market and, if so, how many of which items. It's also worth mentioning that for inventories of raw materials and component parts, the customer is the firm's own production line: for finished goods the customer is the final user of the product. For there is no doubt that holding inventory costs money, so firms don't want to have any more than, is absolutely necessary to keep themselves and their customers satisfied (Gourdin, 2006).

### **2.1.6 Order fulfilment**

Order fulfilment also plays a critical role in the performance of horticultural exporters. Another activity area that logistics might control is order fulfilment, which generally consists of activities involved with filling and shipping customer orders. Order fulfilment is important to logistics because an important physical distribution factor is the time that elapses from when a customer places an order until a customer receives a satisfactory fulfilment of the order. This is also referred to as lead time (John et al, 2013).

### **2.1.7 Demand forecasting**

Demand forecasting addresses the need for accurate information for future customer needs so that the logistics system can insure the right products and or services are available to meet those requirements. If demand is properly forecasted then the export performance of a company increases. Logistics requirements necessitates going beyond market sales forecasting to obtain specific data on

timing, mix, and quantity of benefits desired by buyers. Without this information, the logistics system runs the risk of compromising customer satisfaction rather than enhancing it (Gourdin, 2006).

### **2.1.8 Production planning**

Production planning can be included under logistics because manufacturing needs components and raw materials to make finished goods that are, in turn, demanded by a customer. Thus, production planning is arguably at the centre of the entire logistics process, yet it is often viewed as a stand alone entity with its own objectives and agenda. The risk here is that production rather than customer needs becomes the primary focus, a situation that leads to customer dissatisfaction. (Gourdin 2006)

The techniques required to plan and control the production in an integrated supply chain go beyond the MRP (Material Requirement Planning) so popular in industries. The need to take into consideration manufacturing or service capacity, labour and time constraints has given importance to the Scheduling area (Lourenco, 2005).

### **2.1.9 Procurement**

Cost and quality issues if not addressed properly they impact the export performance of an organization. Procurement deals with the buying of goods and services that keeps the organization functioning. Since these inputs can have a direct impact on both cost and quality of the final product/service offered to the customer. This activity is vital to the overall success of the logistics effort. In addition, the move away from local sourcing in-favour of global buying has complicated this entire process dramatically in recent years (Gourdin, 2006).

### **2.1.10 Customer service**

Customer service is a multidimensional and very important part of any organizations logistics effect. In a broad sense, it is the output of the entire logistics effect: that is, customer service and some resulting level of satisfaction are what the logistics system ultimately provides the buyer.

However, many organizations do not have a more narrow functional view of customer service as something they actually perform. For example, a firm may have a customer service department or customer service employees that can handle complaints, special orders, damage claims, returns, billing problems, etc. For all intents and purposes, these employees are the organization as far as many buyers are concerned. So their role in the overall logistics system becomes crucial. Disappointment at this level can lead to dissatisfaction with the organization as a whole, which effectively neutralizes the entire logistics effort (Gourdin, 2006).

Customers have never before been taken so seriously. The successful fulfilment of customer expectations is a task pertaining to Logistics Management, and deciding the level of customer service to offer customers is essential to meeting a firm's profit objective. Customer service is a broad term that may include many elements ranging from product availability to after-sales maintenance. In brief, customer service can be seen as the output of all logistics activities, that also interact with other functions in the firm, especially with marketing. Since all the elements in the supply chain interact and a decision on one element affects all the others, any logistic decision within the supply chain can affect the customer service (Lourenco, 2005).

#### **2.1.11 Facility location**

Proper facility location plays a vital role in the performance of an organization. Even though the decision is made once the consequences of the decision stay for the lifetime of the organization. If cost increases due to a bad location decision it impacts the competitiveness of the horticultural exporters. Facility location addresses the strategic placement of warehouses, plants and transportation resources to achieve customer service objectives and minimize cost. Although not necessary made often, these decisions can have very long term and potentially costly implications for the organization(Gourdin, 2006).

### **2.1.12 Scrap disposal**

Scrap disposal is not a trivial issue is horticultural export performance. It doesn't only increase the efficiency of the organizations, but it proper application also helps to get a licence to export products to certain markets. Concern over the environment has never been as strong as today. Also, strict regulations regarding removal, recycling and reuse are on the increase, especially in Europe. Logistics is also involved in the removal and disposal of waste material left over from the production, distribution or packaging process, as well as the recycling and reusable products (Lourenco, 2005).

### **2.1.3 Export Performance of the Horticulture Sector**

Ethiopia has managed to transform its horticulture sector with a span of 15 years from scratch to close to 300 million USD export business through attracting potential investors, Ethiopia's Horticulture and Agriculture Investment Authority underscores. In earlier years, the sector was characterized by traditional farming system rather than modern agriculture techniques. As a result, its share for country's economic development was insignificant (Gashaw 2018).

Ethiopia has generated \$261 million from the export of flowers and the remaining \$57 million was secured from vegetables, fruit and herbs export. The export of Ethiopia's horticulture products has been increasing steadily from time to time and especially the flower sector takes the lion's share in generating huge amount of the foreign currency (Newbsiness Ethiopia 2019).

#### **2.1.3.1 Export Performance Indicators**

Access to foreign market and supply capacity are the major indicators of performance in the export process.

### **2.1.3.1.1 Access to foreign markets**

Access to foreign markets is a critical determinant of export performance. Here, the term “foreign market access” is seen as representing the foreign market potential of a country. In that sense, it is a broader notion than the term “market access” as used in trade negotiations. It relates directly to the characteristics of the trading partner countries, such as the size of their market and transport facilities, and inversely to their own internal transport costs. It also depends positively on the size of the export basket and the number of differentiated items and their prices, which in turn are affected by market entry conditions. Trans-border costs, which also include tariff and non-tariff barriers, have the expected negative impact on foreign market access (UNCTAD, 2005).

### **2.1.3.1.2 Supply Capacity**

Supply-side constraints are receiving increasing attention as a constraint on lifting the trade performance of many developing countries. This is one of the reasons why developing countries, especially the LDCs, are often unable to take up opportunities for trade under preferential trading regimes. The main components of supply capacity are internal transport costs and factors affecting cost of production. The latter are strongly related to domestic market structure and the institutional framework. The macroeconomic environment also has an important role in shaping supply capacity (UNCTAD, 2005).

#### **Key determinants of supply capacity**

The key determinants of supply capacity are domestic transport infrastructure, macroeconomic environment, foreign direct investment and institutional capacity.

#### **2.1.3.1.2.1 Domestic transport infrastructure**

The size and the growth of the supply capacity of a country depend critically on the availability of physical infrastructure, ranging from roads and ports to energy and telecommunications. The

UNCTAD study used internal transport infrastructure as a proxy for infrastructure as a whole. It found that the importance and the significance of internal transport structure vary from period to period and from one group of countries to another. It appears that internal transport costs had a significant negative impact on export performance over the 1988-1991 period among the weakest performers. Internal transport facilitation played an important role across all regions in explaining export performance in later periods. Its significance appears to be more marked among the better performing exporters. The analysis therefore suggests that internal transport infrastructures are likely to play an important role at the early stage of export sector development. Most African countries, many of which are LDCs, are characterized by poor transport infrastructure, and are found in all periods to be poor export performers. This appears to indicate that African countries could do much to raise their supply capacity by investing in transport infrastructure.

#### **2.1.3.1.2.2 Macroeconomic Environment**

The real exchange rate, which reflects the underlying relative movement of prices at home and abroad, proves to have a significant effect on the export performance of the lowest performers. Results for all periods indicate, for example, that an over-valued real exchange rate is seriously detrimental to export performance, while on average a 1 per cent real depreciation could increase exports by 6 to 10 per cent. This is not an argument for competitive devaluations of nominal exchange rates, but rather it points to the importance of the pursuit of productive gains to maintain external competitiveness. In other words, good export performers are more likely to have a stronger position in more capital-intensive or differentiated product markets and may face less aggressive competitors than exporters in more labour-intensive product markets. As a consequence, their competitiveness might be expected to be less sensitive to small movements in the real exchange rate, and relatively more dependent on the technological content of their product and thus to a large extent on capital. This is not likely to be the case for producers exporting low-skill-intensive

products, which are highly substitutable and whose demand is very volatile and price-sensitive(UNCTAD, 2005).

#### **2.1.3.1.2.3 Foreign Direct Investment**

The results indicate that FDI is likely to affect export performance positively (UNCTAD, 2002b). This is true for most levels of export performance and for every period under consideration. The experience in a number of countries suggests that FDI strongly contributes to the transformation of the composition of exports.

#### **2.1.3.1.2.4 Institutions**

An important distinguishing aspect of the UNCTAD study is that it takes into account institutional factors. A significant role for institutional quality could have been expected at an early stage of export sector development, but, in the UNCTAD analysis, this is the case only for the 1988-1991 period. This might be explained by the difficulties in isolating the contribution of institutional factors at such a stage, because of the likelihood of their being closely related to the general macroeconomic environment and the contribution of FDI, although there is no strong statistical evidence of multidisciplinary among explanatory variables.

### **2.1.4 Certification and requirements for horticultural exporters**

Horticultural exporters are required to have a certificate in-order to sell their products in different parts of the world. The certification requirements differ from country to country. Some of the important requirements focus on food safety, product quality, social compliance, environmental compliance, use of labour, business compliance etc. Exporters in Ethiopia need to have such certificates in order to export their products to Europe, North America or Asia.

#### ***GLOBAL G.A.P. certificate***

The most commonly requested certification scheme, essential for exporting fresh produce to Europe, is G.A.P. This is a pre-farm-gate standard that covers the whole agricultural production

process from before the plant is in the ground to the non-processed product. GLOBALG.A.P. focuses on food safety as well as the environment, labour conditions and product quality. It has become a minimum standard for most European supermarkets.(CBI, 2018). This certification is among the ones which has many standards related to logistics activities. According to it's website the minimum amount of membership fee for exporters is 5000 Euros per year. They have a timely visit of farms to assess the overall performance of the exporter according to their standards. Without G.A.P's certification is is very difficult to export horticultural products to many destinations in the world.

### ***Limited use of pesticides***

To avoid health and environmental risks, the European Union (EU) has set maximum residue levels (MRLs) for pesticides in and on food products. Products containing more pesticides than allowed will be withdrawn from the European market. Note that buyers in several Member States such as the United Kingdom, Germany, the Netherlands and Austria use MRLs which are stricter than the MRLs laid down in European legislation. Supermarket chains are the strictest and demand 33% to 70% of the legal MRL. (CBI, 2018)

### ***Plant health***

Some countries have laid down phytosanitary requirements to prevent the introduction and spread of organisms harmful to plants and plant products. These requirements are managed by the competent food safety authorities in the importing and exporting countries.

### ***Social and environmental compliance***

There is growing attention for the social and environmental conditions in the producing areas. Most European buyers have a code of conduct to which they will expect you to adhere. For most fresh fruit and vegetables, social compliance is important, although product quality is the top priority. For

example, SEDEX, a non-profit membership organization to evaluate and manage performance on labour rights, health and safety, the environment and business ethics. “Rainforest alliance” is also another example which is a part of the Sustainable Agriculture Network(CBI, 2018).

### ***Soft skills and company performance***

Complying with the food safety requirements, quality standards and certifications is a precondition to market fresh products in Europe, but it is still not a guarantee for success. Buyers look for trust and reliability, which means that your soft skills and performance are just as important as your product. Some of the most important things in the fresh trade are a timely delivery, proactive communication and commitment to agreements. However, good conduct works both ways, so be aware of buyers that have a poor reputation or only show a short-term interest (CBI, 2018).

## 2.2 Empirical Literature Reviews

### Introduction

This section of the related literature review builds on the empirical findings that have been presented by different authors following a study of some logistics activities.

According to the research titled a study on the Kenyan-Dutch horticultural supply chain (2012). The study, commissioned by the Ministry of Economic Affairs, Agriculture and Innovation in the Netherlands and conducted by Flower Watch and Hortiwise, essentially aims at kick-starting an ambitious set of sector wide reforms necessary for the Kenyan–Dutch flower trade to retain and expand its leading role in global horticulture.

The study identifies eight trouble spots in which minor and major problems are holding the sector back:

1. Cold chain management
2. Transport and logistics
3. Packaging
4. Information and communication
5. The relatively weak position of SME growers
6. Handler performance
7. The integration of the flower sector with mass-market retailers
8. Sector-wide teamwork

in conclusion the study identified the following issues:

- Matching phytosanitary (and other government) services with 24/7 requirements
- Knowledge and awareness of cold chain requirements
- Packaging inefficiencies
- Electronic information and documentation

- Creating standards/protocols and importance of compliance

Even if the study on Kenyan-Dutch horticultural supply chain has shed light on relatively more logistics activities, it didn't cover other core activities such as customer service, facility location and scrap disposal.

Another study made on “Cold chain logistics in the floral industry” produced by Babalola Sundarakani and Banesh concluded that successful cold chain is one that reduces costs and damages along the process and every manufacturer involved in cold chain practices need to understand that an hour's delay in a cold chain leads to one day of shelf life reduction. If the waste of the agricultural, food, chemical and pharmaceutical industries caused by lack of training, lack of common standards, lack of common procedures, and lack of adequate measuring criteria; can be reduced, a lot of profit can be maximized by the industries.

From the literature review it is clear that researchers have different views on the export performance of horticultural products and the factors that influence those performances. The researchers have used different approaches that it is difficult to make comparisons among different researches. The researchers used different units of analysis and different variables that it is difficult to make comparisons except for selected variables in some cases.

Addishiwot Nigatu (2016) conducted a research on “Assessment of Logistics Performance in Flower Industry”. She studied logistics performance in-terms of efficiency effectiveness and differentiation. Even if she followed different approach to assess the performance of logistics activities but it I difficult to see the full picture of the performance of the industry with few variables and measurement tools.

Mbekeani (2007) made a research on the role of infrastructure in determining export competitiveness. “With increased competition in major markets forcing business to adapt to just in

time production and management systems, flexibility, speed and reliability in delivery of goods have assumed significant importance. However, for most African countries, inadequate infrastructure and poor transport network make it difficult for their manufacturers to participate in new global outsourcing and just in time production because they cannot guarantee timely delivery of goods or ensure reliability or flexibility in the supply of the goods”.

Mbekeani has expressed how important infrastructures are in helping a country progress in international trade as transport infrastructure play a big role in timely delivery, reliability and flexibility. Even though he state how important transportation infrastructure is, he didn't see it from the angle of trucks and vehicles use. Moreover, he has exaggerated the infrastructure problems in Africa.

Azmat Gani made a research on the logistics performance effect in international trade in 2017. The findings show that the overall logistics performance is positively and statistically significantly correlated with exports and imports. The analysis is also extended by investigating if logistics specificities mattered for international trade. The findings reveal that several dimensions capturing logistics performance have statistically significant and positive effect, mostly on exports. The main policy implication is that continuous investment in logistics infrastructure and services can positively impact international trade (Gani, 2017).

In 2011, Banomyong and Supatn have developed a tool to assess logistics performance based on the 9 key logistics activities proposed by Grant et al (2006) and showed how these activities can affect export performance. The framework includes the following logistics activities: Customer service and support, Demand forecasting and planning, Purchasing and procurement, Inventory management, Order processing and logistics communications, Material handling and packaging, Transportation, Facilities site selection, warehousing and storage, Return goods handling and reverse logistics. The literatures on logistics performance measurement indicated the following

shortcomings: (1) Most firms do not comprehensively measure logistics performance, (2) Even the best performing firms fail to realize their productivity and service potential available from logistics performance measurement, and (3) Logistics competency will increasingly be viewed as a competitive differential or and a key strategic resource for the firm.

Thi Thu and Banomyong (2014) made a study of logistics performance of manufacturing and import and export firms in Vietnam. The result received from study revealed that there are 3 factors which are transportation, warehousing, and inventory carrying costs that mainly affect to logistics cost of Vietnamese manufacturing and export-import firms. In which, transportation cost is at the highest level with the range from 5.02% to 10.86% per sales, depending on different types of enterprises.

According to Fonseca (2015), Logistics includes the management of various aspects that are critical for the competitiveness of smallholders, such as commodity characteristics, infrastructure, market requirements and social practices. This report aims to provide a basic understanding of what logistics systems are and how they function, in order to determine opportunities for improving efficiency all along the supply chain. A common preconception that logistics are mere storage and transportation is challenged by providing an analysis that ranges from international trading to employers' knowledge of food handling. He has identified six variables and showed how they impact the efficiency in logistics in horticulture supply chain. Infrastructure and transportation, Electricity and the cold chain, ICT and communications, institutions policy framework and processes, Post-harvest management, packaging and traceability were the variables. From this study it is possible to see how these variables impact the performance of Horticultural supply chain.

## **Research gap**

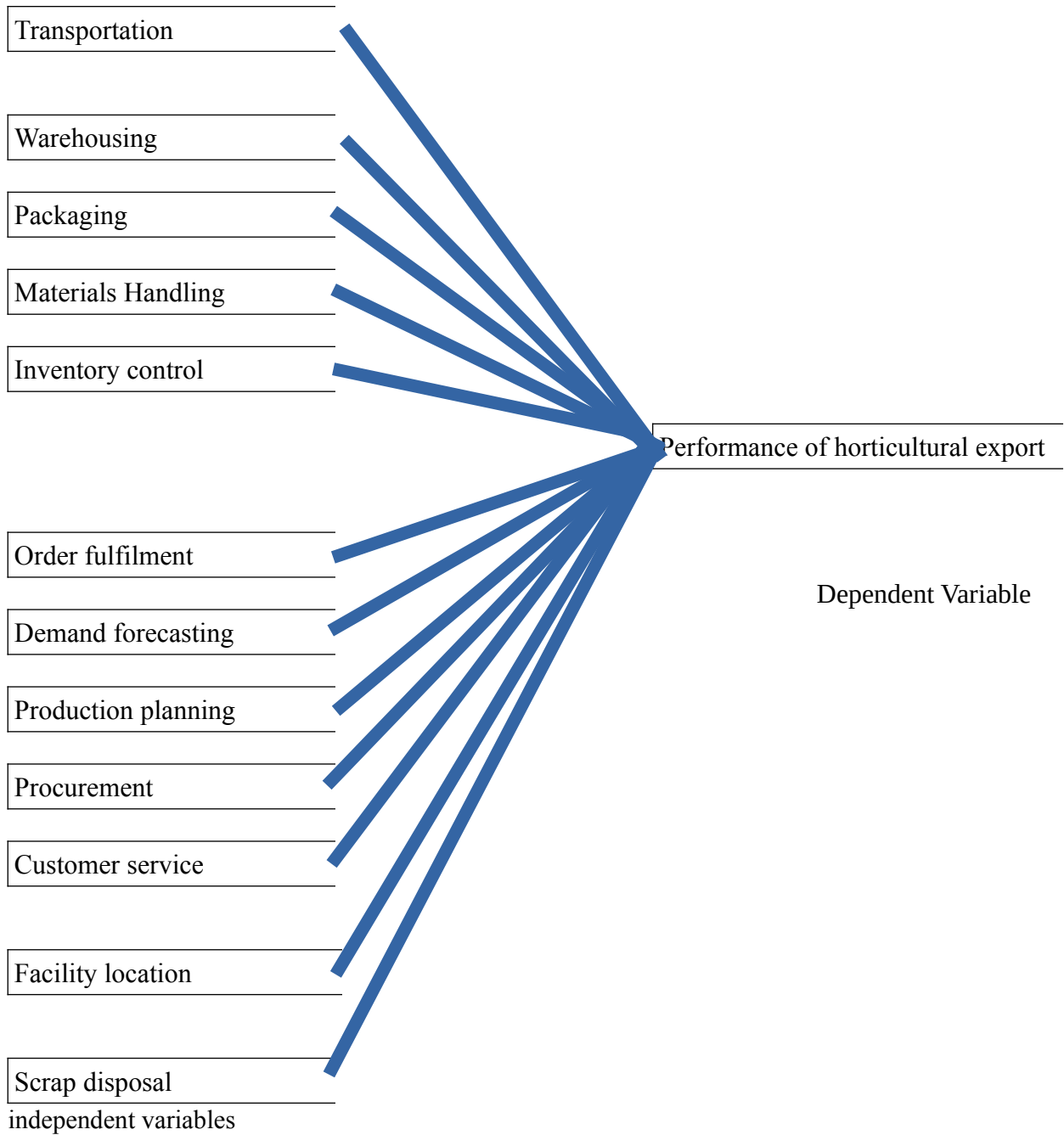
Studies which are made in the horticulture export sector focus on the cut flower cold chain. Moreover, they don't study all the factors of logistics and mainly focus on transport and warehouse issues. Most of the studies are not made in the Ethiopian context. This research tries to fill the gap existing in this respect.

## **2.3 Conceptual frameworks**

A weak logistic function affects the performance of the horticultural export sector directly or indirectly. Today's supply chains are becoming longer and more complicated – and sometimes span several continents. The right choice of logistic services can determine whether or not a fresh produce consignment can be sold. Fresh produce can be shipped by sea, air, road, or in some cases, by rail. It is important to ensure that the delivery process and the packaging of fresh produce on its way from farm to point of sale is adapted to the respective mode of transport (Skoda, 2019).

Improving logistics performance is at the core of the economic growth and competitiveness of the horticulture industry. Inefficient logistics raises the costs loss due to damage of products. The export sector's trade competitiveness can be affected with the way by which its logistic activities are being undertaken. In this study twelve logistics activities which are thought to impact the efficiency of horticulture export have been identified. No research have been done using these twelve variables in one setting. Hence the variables are partly adapted from the researches stated in the empirical literature review

In this study the link between the logistics activities and the horticultural exporters performance is studied in what way the factors affect the performance of export.



*Partly adopted from Kenyan-Dutch horticultural supply chain*

# **CHAPTER THREE**

## **RESEARCH METHODOLOGY**

### **Introduction**

This part describes the methodologies that are used in the study. It includes the choice of particular research designs, data type and source of data, research approach, data gathering instruments, sampling techniques and data analysis techniques. It also includes an appropriate justification associated with each approach.

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

The study was conducted on organizations engaged in the export of perishable agricultural products. The study was on those horticulture producers who export their products through Bole international airport. The study focused on 12 logistical activities in relation to the organizations' export performance.

### **3.2 Research Approach**

The research approach that was followed for the purposes of this research was qualitative research method with semi-structured interview. Qualitative research method helps to explore the rich experiences from the practitioners perspective. Qualitative research is the best approach to address the research method and problem. Therefore, qualitative research approach according to (Creswell 2009) is applicable to little researched phenomena or concept.

Qualitative methodology is much more fluid than quantitative research methodology. One key difference between qualitative and quantitative research traditions is their flexibility. Whereas qualitative methods are typically more flexible, allowing greater spontaneity and adaptation of the interaction between the researcher and the study participant, quantitative research methods are fairly inflexible (Natasha et al. 2005).

Participants in qualitative research have the opportunity to respond more elaborately and in greater detail than is typically the case with quantitative methods as the relationship between the researcher and the participant is often less formal than in quantitative research.

### **3.3 Research Design**

This study used descriptive research method as it tries to describe the export performance of horticultural exporters in relation to logistics activities. Descriptive research involves gathering data that describe events and then organizes, tabulates, depicts, and describes the data collection (Glass & Hopkins, 1984).

### **3.4 Population and Sample**

The qualitative research tradition has a strong correlation with non-random sampling methods. Sampling in qualitative research is chiefly concerned with information richness (Kuzel, 1992) in which two essential considerations which are appropriateness and adequacy take central stage. In other words, sampling in qualitative research needs the significance of identifying appropriate participants who can best report to the study and also the need to recruit adequate sources of information to successfully address the research question and develop a full-fledged description.

The researcher chose convenience sampling to conduct the research. Convenience sampling (also known as Haphazard Sampling or Accidental Sampling) is a type of non-probability or non-random sampling where members of the target population that meet certain practical criteria, such as easy accessibility, geographical proximity, availability at a given time, or the willingness to participate are included. It is also referred to the researching subjects of the population that are easily accessible to the researcher. Convenience samples are sometimes regarded as accidental samples because elements may be selected in the sample simply as they just happen to be situated, spatially or administratively, near to where the researcher is conducting the data collection (Etikan, 2016).

The population of the study were Ethiopian horticulture exporters association member organizations which are 92 in total, although there are registered exporters which are not actively working at the time when the research was conducted. A sample size of 12 people who are engaged in the horticulture industry were selected non-randomly. These participants of the interview were owners, farm managers and managers of the concerned organizations. One participant is an expert from horticulture exporter's association.

In qualitative research, sampling is an on going process which is difficult to predetermine. Sampling in qualitative research continues until themes emerging from the research are fully developed, in the sense that diverse instances have been explored, and further sampling is redundant (Fossey Et al, 2002 p.726). This condition is occasionally referred to as 'saturation' during which patterns are recurring and no new information emerges from more samples (MacDougal and Fudge, 2001).

In non- probability sampling, there are no rules to determine the sample size. The researcher is the one that decides the appropriate number according to the circumstances of the study. In this study, information saturation was reached at around the 12<sup>th</sup> interview. Adding an additional participant would only be redundant as the necessary information was already obtained.

### **3.5 Data Sources and Types**

As to the purpose of this study one basic instrument has been used which is an in-depth interview. Primary data was obtained directly from respondents through the administration of in-depth interviews. The primary data provided reliable and accurate first hand information to the study. The main purposes of the interview was to investigate the problematic areas focusing on export sector of the horticulture industry in Ethiopia. The study was made on the logistics activities of the horticulture industry.

### **3.6 Data Collection Procedures**

Two types of recording were employed for the appropriate documentation of the data. Willing participants were tape recorded while notes were taken. Some interviewees were not willing to be recorded that only notes were taken from the interview. Sections of the recorded data were then transcribed and translated into English when the interview was conducted in Amharic. Some interviews were conducted in English as there were foreigners owning or running the organizations. In-depth interviews are used to get participants to provide an account of their experiences, of how they view their own world and the meanings they ascribe to it (Limb and Dwyer, 2001).

Interviews are most useful when you need to know about people's experiences or views in some depth, the issue is sensitive, and people may not be able to speak freely in groups (Laws, Harper & Marcus 2003). Interviews help to get peoples feelings, attitudes, beliefs, experiences and identify trends by asking follow up questions independently.

### **3.7 Ethical Consideration**

Ethical Considerations relates to moral standards that the researcher should consider in all research methods in all stages of the research design. In the research approach the researcher has respected beneficence, respect for human dignity as well as justice.

The study participants were informed about the purpose of the study. The respondent had the right to refuse at any point of the data collecting. The findings are not referred to specific individual or institution. The aim of the study and confidentiality issues were explained especially for those who had concerns.

### **3.8 Method Analysis**

Qualitative data analysis is a dynamic, intuitive and creative process of inductive reasoning, thinking and theorizing (Basit, 2003). Transcribed interviews possess a great potential to sufficiently illuminate the research issue. The data should be methodically analysed to effectively illustrate the significant ideas that would help provoke a broader understanding of the problem. In order to successfully sort through the collected data and extract the core concepts, it was necessary to engage in coding and categorizing of the data.

### **3.9 Validity and Reliability test**

The use of reliability and validity are common in quantitative research and now it is reconsidered in the qualitative research paradigm (Golafshani, 2003).

#### **3.9.1 Validity**

Validity of an instrument is how accurate the instrument is in obtaining the data it intends to collect (Mugenda & Mugenda, 2003). Validity indicates the degree to which the instrument measures what it is supposed to measure (Kothari, 2004). To ensure precision, relevance and content validity of the instrument face validity was used. Thus, the instruments used are valid.

#### **3.9.2 Reliability**

Reliability tests measure the consistency of the scores obtained, and how consistent they were for each individual from one administration of an instrument to another and from one set of items to

another. If the credibility, transferability, dependability and conformability aspects of the research are met, the research can be said to be reliable. It is thus possible to check the reliability of this research using these four criteria.

# CHAPTER FOUR

## DATA ANALYSIS AND INTERPRETATION

### Introduction

This chapter presents the results and analysis of the responses to individual questions made on logistics activities. A total of 12 interviews were conducted. The participants were top managers or owners from 9 horticultural products exporters and one horticultural expert from the horticultural exporter's association. The interviewees were selected because of their knowledge, expertise and many years of work experience in the horticultural export sector. The questions contained in the interview were based on review of literature.

The first part of the interview consists of four questions about demographic information of the respondents. It covers the personal data of respondents such as: Gender, Educational Background, and form of employment, and number of years in the horticulture export sector. The following table will indicate the total demographic characteristics of the respondents.

	Gender	Education Background	Position	Number of years in the industry(org.)
INT 1	M	Diploma	Owner & Mgr	25
INT 2	M	-	Owner & Mgr	11
INT 3	M	Bachelor	G. Manager	15
INT 4	M	PhD	Country director	13
INT 5	F	Bachelor	Office manager	13
INT 6	F	Bachelor	Deputy Mgr	5
INT 7	M	Master	Manager	5
INT 8	M	Master	Dep. Farm Mgr	9
INT 9	M	Bachelor	G. Manager	15
INT 10	M	Bachelor	Project Mgr	14
INT 11	M	Bachelor	Deputy Mgr	8
INT 12	F	Bachelor	Deputy Mgr	11

Table 2 Demographics of Participants

## 4.2 Data Analysis

The data collected from interviewees through Semi-structured interviews is analysed and presented in the sections below. Each of the 12 logistical activities are analysed separately.

### 4.2.1. Data Analysis of transport

Transport is the fundamental logistic activity that affects the performance of horticulture exporters. Some of the important efficiency indicators in transportations are cost minimization, fleet management systems, timely repair and maintenance of vehicles etc. Regarding external transport quality indicators, per unit cost of transport, repair and maintenance service availability, and transport infrastructure are mentioned. Transportation is an area that absorbs a significant amount of the cost in most firms. Therefore, methods for dealing with the important issues in transportation, such as mode selection, carrier routing, vehicle scheduling and shipment consolidations are needed in most companies (Lourenco, 2005).

In conducting the in-depth interview, the following questions were raised regarding transport issues. The subsequent answers are attached under each question.

**How do you assess the transport infrastructure in Ethiopia in relation to horticultural export performance?**

*INT 1 'The road infrastructure is generally good. Most farms are within close proximity to paved roads. May be some 2-3% are off the main road.'*

*INT 4 "The road quality is poor in some areas where our farms are located. Our vehicles are getting damaged because of the many potholes on the road. In the rainy season specially there is a problem"*

*INT 10 “As you can imagine we for our business rely on imported fertilizers, chemicals, packaging materials etc. It is very poor. Coming from boarder crossings trucks are not allowed to drive from one country to the other, regulation shortage of transport, big queues at the port of Djibouti. Price of transport from Djibouti to here is very high. That needs to be addressed because it is becoming a big problem”.*

*INT 10 “Roads, in general are quite good. The only problem if I speak to our farm is, it is becoming very congested, when we started more than 10 years ago it took less than half an hour to get to the farm. Nowadays with a very congested road, it takes you more than 1:30 hrs. Majority of roads are better but I don't know if you know this place “Ashewa meda”, it is a nightmare everyday....”.*

**Do you use your own trucks for transportation or do you outsource the service? If you outsource transportation service, are there good service providers in the Market?**

*INT 5 “Once our truck was out on the way carrying horticultural product for export. While it was on the way, it break down. We had difficulty to transfer this truckload of shipment to another refrigerated vehicle. To our dismay, we couldn't do it due to the lack of such service providers”*

*INT 4 “These service providers are not reliable. They don't come on time to take your shipment. One truck serves a lot of companies. This makes it difficult for them to provide a quality service”.*

*INT 1 “Most exporters use their own refrigerated trucks.”*

*INT 10 “We rent from EPL (Ethiopian perishable logistics). We have collogues in Kenya who use similar service. In general their service is ok and their quality of the trucks is*

*very good. EPL uses old trucks. There is no much investment going in this business. As a flower company you want to do your core business. But here you need to do a lot of side businesses you really don't want to do. Like for instance transport. Why do you as a flower company need to concentrate on transport? It is an additional headache. Problems, accidents, drivers, breakdowns.... same goes for import. Why are we importing all the goods when someone can import and sell for us? Why are there no good local suppliers? When we need to focus on our core business, we spend 90% of our time in making sure all the inputs are on time, sorting out other issue, etc."*

**Are there spare parts and repair service providers for your refrigerated trucks?**

*INT 4 "We only know one guy who can do such repairs and there is a shortage of people and firms who offers such kind of service. It is also very difficult to get spare parts"*

**Are your refrigerated trucks used or new?**

*INT 1 "The trucks are mostly old second hand trucks which were used in Europe. The government gives tax privileges for importing refrigerated trucks. New trucks in Europe cost around 100,000 Euros while the second-hand one costs around 30,000 Euros"*

*INT 6 "Our trucks are used and we have a duty free privilege to import them tax free but only for the first time".*

**Do you use fleet Management systems?**

*INT 5 "We don't have a dedicated fleet management system but we control fuel usage of trucks. Our trucks are fitted with GPS to monitor their whereabouts".*

*INT 5 "We do monitor the whereabouts of our trucks and use no other fleet management system".*

## **How do you assess the air cargo service at Ethiopian Airlines?**

*INT 2* "Ethiopian Airlines has dominated the business. In Kenya, Ecuador and Colombia, the sky is open to competition. It limits certain things. The main disadvantage is there is no direct connection between here and Amsterdam. This is the main country as a major producer of fresh flowers to not have direct connection to Amsterdam. For a specialized farm like us, it is a huge, huge problem because we can't serve our customers in Amsterdam. It is impossible to make small shipments."

*INT 12* "We can't complain as we don't have a choice...."

*INT 6* "The destinations of Ethiopian airlines cargo are fewer that we can't send our products to many destinations. Moreover, Ethiopian airlines may not pay compensation for product damage caused by it's faults. Other Airlines such as Lufthansa may reimburse up to 75% of the damage on goods".

*INT 9* "The air freight cost is high in Ethiopia taking 50-60% of the cost of goods sold"

*INT 10* "We do majority of shipments with Ethiopian Airlines. We are quite happy. First few years a lot of issues and problems. But everyone was new to the business. Slowly but surely it is moving in a right direction."

## **Have you ever experienced product quality issues related to transportation?**

*"We haven't got such a significant damage due to land transport problems, but whenever the road had potholes and not level, the trucks vibrate. This means the products in the trucks are affected by the vibration and their quality could deteriorate".*

*INT 11* "Yes, as we are far from Addis it takes long hour for the truck to arrive to the airport. It is common to have damages of 2-5%."

**Do you think there is a need for another mode of transport in Ethiopia for horticultural export? Why?**

*INT 2 “As the air freight is the one which is taking the bulk of the cost of goods sold, it is good to have another mode of transport. There were different trials to use the cheapest mode of transport for horticultural products. Products are shipped from Latin America to USA using ships as it is has a short distance. Some have said that there could be an option to export horticultural products by ship to the middle east in the long run. They have doubted the likelihood of shipment to the middle east using ships with the current inefficiency in handling shipments across the border to Djibouti.*

*INT 7 “There are standard size refrigerated containers (40 and 80 feet). These are like the normal type containers but have a good refrigeration system. Horticultural products could be shipped using these containers. They can keep the products fresh for a month and half. We are not using this technology. We may start to use it once the Ethio-Djibouti railway starts to operate efficiently. Compared to Air transport, water transport is far cheaper and also environmentally friendly as it uses less fuel”.*

*INT 10 “To give you an I idea in South America there is a lot of flower, vegetable and fruits coming by containers in Europe within two weeks from the farm, so it very fast. There is huge potential, cost saving, protecting the environment (air plane engines use lots of CO<sub>2</sub>).*

*INT 11 “As we are located in Raya (Wollo). We would be happy if we get another mode of transport. We hope, in the future we could get train transport service”*

### ***Important points from the transport interview***

Horticultural exporters were mostly satisfied with the road infrastructure and road Network. Some have complained about poor quality connecting gravel roads in relatively remote locations. Many have also complained about the high traffic jam in Addis Ababa which is hampering their effort to deliver their products to the airport promptly. Some were emotional when expressing the traffic congestion showing how it is increasing their frustration.

Most exporters use their own refrigerated trucks. Many organizations complained about the fact that there are few cold truck transport service providers. Some said that there were instances where they couldn't send their export using a service provider's truck as their truck malfunctioned. One exporter was very disappointed when he expresses the need to do side businesses, like product transportation, when he has to focus on his core business which is growing flowers.

Most companies use second hand refrigerated trucks imported from Europe. Most of the refrigerated trucks are at least 8 years old. It is not difficult to find organizations with a malfunctioning truck stopped over three years due to lack of spare parts and service personnel. As the refrigerated truck are driven on rough road, they damage their refrigeration systems. Many organizations had difficulty in importing spare parts.

Event though there were tremendous success by Ethiopian airlines in improving it service and the Cargo terminal, there are still major issues in the industry. Small scale producers rely on the services of Ethiopian airlines. Horticultural products are transported using both Cargo and passenger planes. Though infrequent some exporters complain about shipment cancellations by the airline. Ethiopian airlines doesn't fly direct to Amsterdam. It instead flies to a city called Liège in Belgium and horticultural products are then taken by another mode of transport to Amsterdam. On the other hand KLM, Kenyan and other airlines fly direct to Amsterdam. This has created a big problem for small scale exporters. Some were very sad when expressing the situation.

Some say, Ethiopian airlines could have taken all the responsibility to ship the products to Amsterdam after it has landed in Liège. Other Airlines which don't fly direct to Amsterdam take care of their customer's cargo and ship it by another mode of transport to Amsterdam. As Ethiopian Airlines doesn't have such kind of service, exporters are incurring extra cost for handling the transit by a third party. Other Airlines such as KLM fly direct to Amsterdam but they are ideal for large producers.

Most of the organizations had very few product damage issues due to land transport problems in the past. Some said that the damage caused by land transportation problems were insignificant.

#### **4.2.2 Analysis of Warehouse and Cold store**

The second area which has a trade off relationship with transportation, is storage. A number of important decisions are related to storage activities, including how many warehouses, how much inventory, where to locate the warehouse, what size the warehouse should be and so on (John et al. 2013). Warehousing is an integral part of every logistics system and plays a vital role in providing a desired level of customer service. Warehousing can be defined as the part of a supply chain that stores products (raw materials, parts, work-in-process and finished goods) at and between points of production and points of consumption (Lourenco, 2005).

In conducting the in-depth interview, some of the following questions were raised regarding warehouse/store. The subsequent answers are attached under each question.

**Are the warehouses you use are fitted with appropriate refrigeration system?**

*INT 1 "Yes our cold store is fully functioning and wide enough to hold a large amount of cut-flowers"*

*INT 4 "Yes, we have state-of-the-art cooling facility and we have no problem with that"*

**Are the warehouses fitted with loading and unloading machines like forklifts and cranes, are they good for the movement of raw materials handling equipment?**

*INT 10 “We don’t use much equipments everything is done manually.*

**How do you evaluate the quality of warehousing service at Addis Ababa international airport?**

*INT 4 “I have been to different African countries like Kenya, Uganda and Tanzania they have a great warehouse facility at their airport compared to the one at Bole international airport”*

*INT 9 “The last couple of years the service at Ethiopian airlines has tremendous progress. Their cold store facility is very good”*

#### ***Important points from the Warehouse interview***

Most of the respondents were happy about their cold store facilities. Like refrigerated trucks the problems with cold stores are similar. Lack of spare parts and repair service in the country. Some of the respondents said that the parts of the refrigeration system fail due to current fluctuations in electricity supply. Most have stressed the importance of cold stores in the cold supply chain. As the cooling system should be working 24 hours there should be a constant supply of electricity. They need to run their generators for long hours and their fuel expenses is staggeringly high due to frequent blackouts.

Most exporters had refrigeration systems to comply with the cold chain system but their floor space may not be large enough allowing a free movement of people, goods and materials. Most warehouses were not big enough to use forklifts.

Cold stores are also needed at Bole international airport where the horticultural products in transit are stored until their shipment. Many exporters appreciate how Ethiopian airlines has renovated the cargo terminal and the cold stores in particular. Refrigeration systems at cold stores are in a good

condition in all farms. Warehouse designs that doesn't accommodate materials handling equipment are common. It may hamper the shift from ,manual intensive material handling to machine intensive handling of materials.

### **4.2.3 Data Analysis of Packaging**

A third area of interest to logistics is industrial (exterior) packaging. Industrial packaging protects the product during transportation and storage and includes materials such as corrugated (cardboard boxes), stretch wrap, banding, bags, and so on (John et. Al, 2013).

In conducting the in-depth interview, some of the following questions were raised regarding packaging issues. The subsequent answers are attached under each question.

#### **Are there enough supplies of packaging materials?**

*INT 4 “Automation of he packing process would have been better but there is a problem in electricity supply and also availability of repair service”.*

*INT 1 “The packaging materials supplied locally have a moisture absorption problem. For this reason we use voucher system to import our own packaging materials”.*

*INT 2 “Ethiopian flowers can compete well with flowers originating from Latin America, but due to the packaging materials used the flowers were not accepted well”.*

*INT4 “We import our packaging materials from abroad. We would be happy to see packaging material producers who can supply constantly, have good quality products and have different colour patterns in their products”.*

### **How do you source packaging materials?**

*INT 3 “We import. It is very unfortunate to import packaging materials for a country which is in a huge shortage of foreign currency. It is possible to plan to process these packaging products in the country but it is petty that we couldn’t do it. A poor country like Ethiopia is importing even the small things like rubber band from England”.*

### **What role does packaging play in product quality?**

*INT 2 “It makes a big difference when a carton is strong, rigid and doesn’t absorb moisture. It protects the flowers a lot better”.*

### **What is the percentage of packaging cost in comparing to final product cost?**

*INT 11 “It takes some 10-15% of the total cost of goods sold”.*

### **What are the other problems that you have regarding packaging?**

*INT 11 “We are allowed to import packaging materials duty free. You have to prove that you are using all your packaging materials. If the packaging materials you have imported are found to be missing a penalty is paid. Even if the packaging material is damaged and not used by our farm”*

### ***Important points from the packaging interview***

Packaging materials shortage and quality issues were among the most cited problems by exporters. Most organizations import their own packaging materials duty free. Most of them are not happy about importing their own packaging materials for tax free. Most interviewees said that importing anything in Ethiopia has a long lead-time and they would be better off if they could get a good quality packaging materials in the local market with a reasonable price. When they try to use local packaging materials their products were graded low or totally rejected. One exporter said if packaging quality is poor people may not buy the flower even if the flower quality is very high, the

issue is more grave in Asian market where customers are very picky. Packaging doesn't only play a good presentation role, it affects the quality of the horticultural products which are being exported.

#### **4.2.4 Data Analysis of Materials handling**

A fourth area to be considered is materials handling, which is also of interest to other areas in a typical manufacturing organization. Materials handling is important in warehouse design and efficient warehouse operations (John et al, 2013).

In conducting the in-depth interview, some the following questions were raised regarding Materials handling. The subsequent answers are attached under each question.

##### **Do you use materials handling equipment? What sort?**

*INT 1 "Almost all activities are conducted manually. I have seen sorting machines that sort the flowers by their size in Kenya. But here we mostly use manual labour".*

*INT 3 "As the weight of the cartoons are light we use manual labour to load products. Whenever there is a need, we use Wagner to carry heavier load"*

*INT 4 "We have state of the art packing facility and we use 100% Manual labour"*

##### **What Kind of automated material handling equipment do you use?**

*INT "Most farms have conveyor belts in the sorting and packing process. Instead of machine operated equipments, farms use simple hand trucks and wheelbarrows for materials handling. Only big farms have forklifts and other better materials handling equipments".*

### ***Important points from materials handling interview***

There is a tendency to use less materials handling equipments. Loading and unloading is usually done manually. The average carton weight is around 11Kg that they don't use Materials handling equipments. Most respondents said that they use manual labour except use of simple materials handling equipments like wheelbarrow. Almost all farms don't use palletization. If pallets are not used there is no need to use forklifts. The cartoons are simply kept piled up. An exporter with many years of experience in the industry explained the situation like this. Even though labour is cheap material handling equipments can significantly reduce the need for more labour force, the safe and swift transport of materials.

### **4.2.5 Data Analysis of Inventory Control**

As horticultural products are perishable in nature, the inventory turnover is very high. Once harvested it is a rare event to find cut flowers in stock for more than two days. Finished goods/product inventory is like no other goods inventory in the horticulture sector. The nature of the products is highly perishable that they need to be shipped as soon as they are packed. Whenever there is a need to keep the products in store, they usually stay for about two days. Fifo is used as an inventory control system of finished goods.

In conducting the in-depth interview, some of the following questions were raised regarding inventory. The subsequent answers are attached under each question.

**How is inventory control of harvested crops kept? How different is inventory control in the horticulture industry?**

*INT 7 "Most farms use Bin cards and excel to record what has been harvested but some farms have automated recording system. Crops are recorded as they leave the green*

*house, enter the pack-house, enter the store, when they are loaded on truck and finally when they are sold”*

*INT 1 “We hold inventory of each and everything. Cut flowers are counted and recorded daily, those damaged are also recorded.*

*Int 2 “We don’t usually keep flowers for more than two days so that there is a little rotation of inventory”*

*INT 12 “We hold our produce for a maximum of three days. In most cases the flowers are shipped soon after harvest”.*

### **How do you keep inventory of raw materials?**

*INT 1 “As price is constantly on the rise, we hold an inventory of essential raw materials required for three months. When our cash flow is better we order even much higher”*

*INT 10 “Our colleagues in Kenya hold stock for maximum of a week, of all their good. But because you have to import everything. Delays of 3-4 month are easy. All your money is timed up in stock. You can’t use it for your operations. You have a lot of stock and money tied up which you can’t use for your operational things and it goes for everything fertilizers, chemicals rubber bands staples...everything”*

### **How high is your inventory carrying cost?**

*INT “It is very high because we have to buy a lot of raw materials as we need to hold a lot of back up inventory due to the uncertainty of supplies in the country”*

### ***Important points from the inventory control interview***

Many have complained about the need to carry a large inventory of raw materials. Some organizations order large quantities of chemicals and pesticides. The higher the products are

imported the higher their chance of not being used before their expired date. Many respondents were not happy about their raw material inventory efficiency. As clearly seen, importing in bulk from abroad is affecting the inventory control efficiency negatively. Some import materials with less than a year expire date. This shows a lack of control when products are imported in to the county.

#### **4.2.6 Data Analysis of Order Fulfilment interview**

Another activity area that logistics might control is order fulfilment, which generally consists of activities involved with filling and shipping customer orders. Order fulfilment is important to logistics because an important physical distribution factor is the time that elapses from when a customer places an order until a customer receives a satisfactory fulfilment of the order (John et al, 2013).

In conducting the in-depth interview, some of the following questions were raised regarding order fulfillment. The subsequent answers are attached under each question.

##### **How much of your products are direct order and how much are sold by auction?**

*INT 7 “Some 82% of cut flowers are sold on auction held in Europe. Almost all vegetable and fruit growers sell their produce directly to the buyer after receiving order in advance”*

##### **How much percentage of your products are shipped on time from the direct order?**

*Int 2 “99% are shipped on time. The delays are sometimes, the plane is full and it doesn't take our shipment. Another problem that we get is the airlines forget to give the documents and the shipments are blocked because of missing Phytosanitary certificates....”*

### **What are the major cause of delays in fulfilling order?**

*INT 4 “Most of the time we deliver on time. If there are delays it is because of flight cancellation or document issues”.*

### **How much percent of your products are delivered damage free?**

*INT 6 “We try to deliver 100% of products defect free but there could be up to 10% defects”*

### **What percentage of your products are delivered with correct documentation?**

*INT 5 “Most of the time the products are delivered with proper documentation But sometimes documents are not delivered properly due to mishandling at Ethiopian airlines. The airlines doesn’t take responsibility for the damage caused by missing documents”.*

### ***Important points from order fulfilment interview***

If there is damage to the products it is likely to be in the production process. Most exporters said that the chance of shipments with damaged products is very small. Some said that it is less than 1%. In the flower export sector products are sold either by auction or by direct order. When there is direct order the products are prepared according to the requested order. When there is an auction, flowers are shipped direct to their destinations and they are put forward to be sold by auction. Most exporters say that they are good in-terms of keeping order delivery times. If there are delays, which are not frequent, most of them blame the airlines. It is possible to say that almost all exporters have a good tradition of fulfilling orders.

### **4.2.7 Data analysis of Demand forecasting**

Demand forecasting addresses the need for accurate information for future customer needs so that the logistics system can insure the right products and or services are available to meet those

requirements. Logistics requirements necessitates going beyond market sales forecasting to obtain specific data on timing, mix, and quantity of benefits desired by buyers (Lourenco, 2005).

In conducting the in-depth interview, the following questions were raised regarding demand forecasting. The subsequent answers are attached under each question.

**Do you make demand forecast?**

*INT 7 “Marketing teams are usually the ones who make demand forecast as they are the ones who participate on exhibitions and contact the buyers. They do yearly forecast and the farms will produce accordingly. When there are special situations that require special order due preparations are made. For example, red roses are in high demand for Valentine's day and proper assessment is made as to prepare those flowers for that day”.*

*INT 3 “We use direct sales. If a customer comes and make instant order we can't accept. Our customers are committed to make long term agreement. For this reason demand fluctuation is low. In summer seasons of Europe they produce their own vegetables that demand is expected to be low. We make our customers to be committed to buy from us at least 50% their summer purchase. If they don't do this we are not going to supply for them”.*

**What are the factors that affect demand forecasting in the industry?**

*INT 7 “It is affected by competitor activity, market in other producers and demand in buyer's market”*

*INT 2 “Usually we have clients who order once or twice a week. We know every week what they are buying. There is no much change. There are special vacation time when they buy more or less we know”*

**How difficult is it to make forecasts in your industry?**

*Int 2 “Usually we have clients who order once or twice a week. We know every week what they are buying. There is no much change. There are special vacation time when they buy more or less we know”*

**How accurate is your demand forecast accuracy rate?**

*INT 9 “There is no such thing as demand forecast in our industry. We actually make demand forecast but it is highly unpredictable. Our products are very much dependent on the weather condition, pests, and market condition. It is hard to make an easy forecast”*

**Do you monitor competitive activities in order to make a better forecast?**

*INT 3 “Yes, we do that is our main activity...”*

*INT 6 “Yes, we do monitor the activities of our competitors and we make demand forecasts accordingly”.*

**Do you make long term capacity requirement forecasting?**

*INT 3 “We do follow up in demand trends. We adjust our plan accordingly”*

***Important points from demand forecasting interview***

Demand forecasting though practices in the horticulture industry, it is quite different as it is affected by weather. Sometimes producers have a few number of customers who regularly make orders.

There are different factors that affect demand forecasting. For flower exporters holidays play a major role. Some make competitor analysis others don't see the need. From the interview it was possible to see that demand forecasting is not an easy thing in the Horticulture industry. The demand forecast accuracy rate is low. Even though there are circumstances which make demand forecasting hard in the Horticulture industry, there seems to be negligence in his respect.

#### **4.2.8 Data Analysis of Production planning**

Production planning can be included under logistics because manufacturing needs components and raw materials to make finished goods that are, in turn, demanded by a customer. Thus, production planning is arguably at the center of the entire logistics process, yet it is often viewed as a stand alone entity with its own objectives and agenda. The risk here is that production rather than customer needs becomes the primary focus, a situation that leads to customer dissatisfaction (Gourdin, 2006).

During the in-depth interview the following questions were raised regarding production planning. The subsequent answers are attached under each question.

##### **What factors affect your production planning most?**

*INT 3 “Fertilizers, chemicals(pesticides) packing materials are the major inputs that we use. All these three things are imported from abroad”*

##### **How do you evaluate the labour supply in Ethiopia?**

*INT 3 “We have enough labour supply especially after the government prohibited the flow of workers to Arab countries”*

*INT 4 “The labour supply is good in Ethiopia but we have difficulty in finding qualified farm manager, irrigation manager, Logistics manager. Moreover, the people we find in the job market don’t have the required level of English proficiency”*

*Int 2 “Not that good, not that happy, not that productive. In Holland with all the technology 3 people per hectare, in Kenya 18-20 people per hectare, in South America 12 people per hectare. Here we have 30 people per hectare...”*

### **What is the percentage of waste? What do you do to reduce waste?**

*INT 3 “Our wastage is 35% in the production process and it is considered normal in herb production. The industry best standard is 27%and we are working to achieve this goal”*

*Int 2 “The norms are 5% in floriculture but we we are now 30%. I’ve been fighting because the technicians are not supposed to due to prevent diseases. It happens sometimes, in the rainy season it could go to 10-15%).*

### **What percentage of your production capacity is utilized?**

*INT 7 “Most farms use 50-60% of their capacity as the market now is highly competitive. As Kenyans and other Latin American countries are also exporting making the competition stiff. Other factors such as political upheavals and weather conditions could also make farms not to use their full capacity”.*

*INT 10 “We use everything we have. As we are growing summer flowers we need to rotate . We have to plant something new”*

### ***Important points from the production planning interview***

Most of the interviewees don't have complains regarding labour supply shortages. Some say there is a shortage in December as it is a harvesting season. They said labour cost is reasonable in Ethiopia that most activities are done manually. But most producers complained about the productivity of workers. Compared to many other countries the labour needs per hectare is lager in Ethiopia. Many farms were not using their production capacity in full because of many reason. Some Organizations said they use 100% of their production capacity. Many have difficulty in waste minimization and using their full capacity. Most have recognized the need to use more of their capacity and the need to reduce waste.

## 4.2.9 Data Analysis of Procurement

Procurement deals with the buying of goods and services that keeps the organization functioning. Since these inputs can have a direct impact on both cost and quality of the final product/service offered to the customer. This activity is vital to the overall success of the logistics effort. (Gourdin, 2006)

In conducting the in-depth interview, the following questions were raised regarding procurement. The subsequent answers are attached under each question.

### **Are there enough suppliers in the local market that supply herbicide and pesticide?**

*INT “There are quite few suppliers that supply fertilizers, chemicals and pesticides. We import our own chemicals and fertilizers. We would be very happy to see local suppliers who could deliver us a good quality product.”*

### **What are your rate of emergency purchases?**

*INT 3 “Emergency purchases are very rare and they are mostly done whenever there is a delay in importing raw materials purchased from abroad”*

### **What measures do you take to reduce procurement costs?**

*Int 8 “No, we import everything as the lead time to import is long. In Kenya it is not like this, if you order in the morning, whatever input that you need in the production process, you will get it in the afternoon”.*

*Int 2 “Local people are expensive and sometimes there is shortage. Importing huge quantities is possible but you need a good cash flow.”*

*INT 4 “Due to the length of time it takes to import all the chemicals we need in the production process we are not able to use our full production capacity”.*

*INT 6 “We like to import a year-long needs of our raw materials due to uncertainty in supplies caused by import delays. But we are careful not to import raw-materials which expire within a year”*

**What procurement issues do you have and what should be done to solve the problem?**

*INT 10 “When we are running out of stock, we buy from local suppliers. The service quality is getting better. There are still problems that need to be address. Documentation problems. Don’t issue VAT receipt unless yo pay extra. I miss the entrepreneurs spirit here. There are problems following up emails and calls. There are big service quality issues”.*

**Important points from procurement interview**

The highlight of this interview was a lack of suppliers that supply fertilizers, chemicals and pesticides. Most of them import their own chemicals and fertilizers. They say they would be very happy to see local suppliers who could deliver us a good quality product. They complained that there is a supply shortage whenever there was a need to buy locally. Moreover the price of products locally sold are very high. Procurement problems seams to be the main bottleneck in the horticulture industry.

**4.2.10 Data Analysis of Customer services**

Customer service is a multidimensional and very important part of any organizations logistics effect. In a broad sense, it is the output of the entire logistics effect: that is, customer service and some resulting level of satisfaction are what the logistics system ultimately provides the buyer (Gourdin, 2006).

In conducting the in-depth interview, the following questions were raised regarding customer service The subsequent answers are attached under each question.

### **Who are your customers?**

*INT* “Most of our customers are from Europe and North America”

*INT 6* “We have customers who regularly take our products. They are mostly from Netherlands, Belgium and France.

### **How do you measure customer satisfaction?**

*INT 3* “Yes we do measure. We give forms for our customers to rate our products and services”

*INT 6* “We either sale to a sister company in Europe or to a middle person that resale our products. For this reason the customers are handled by those organizations. We get the feed back from the sales person directly”

### **What is your customer retention rate?**

*INT 3* “We can say that we have a high customer retention rate. We have customers who are still with us starting from 2010”

### ***Important points from customer service interview***

Most exporters don't have customer satisfaction measurement system. Some use a third person who sales their products in a foreign market and the 3<sup>rd</sup> party will be responsible to get customer feedback. Some companies have intermediaries in a foreign country that monitors their customer service. That is they don't have direct communication with the end customer. Some organizations have a dedicated person to answer calls and emails. One exporter complained about the lack of good English speaking in Ethiopian market. He said it has created a problem for his business. Most companies don't have a precise ratio of customer retention, they have expressed that they have a long lasting relation with their customers. The key to retain customers as most believe is supplying products with a constant quality. Most are good at customer service but seams to overlook the need to monitor customer satisfaction rate.

#### **4.2.11 Data Analysis of Facility locations**

In facility location decisions the most prominent point that made the growers choose their production location is altitude suitable for their farming and proximity to Bole international airport. Location decisions are fundamental as it is difficult to relocate after production has started. They have a high impact on transportation and warehousing costs as well (Gourdin, 2006).

In conducting the in-depth interview, the following questions were raised regarding facility location. The subsequent answers are attached under each question.

##### **what were the major factors considered to choose your farm location?**

*INT 3 “It is the right Ecology for herb production. The owners were also happy because the land was not confiscated from farmers.”*

*INT 2 “The main reason for choosing this location was altitude and proximity to the airport”*

##### **What is the role of the investment commission in facility location?**

*INT 11 “As we are located in a remote location we are not getting electricity, road and other type of services in a good way. There is now a talk in investment commission about creating one corridor horticultural service for a cluster of horticultural farms”*

*INT 2 “It had no role in helping us chose this location. We are the ones who chose it”*

##### **What are the problems at your facility locations?**

*INT 3 “We have a major problem in telecommunication. The supply of electricity fluctuates is a big challenge. We have sensitive equipments which are cooling system, fertigation systems. These systems are damaged not only because of power outages but mainly because of low voltage currents.”*

*INT 8 “Due to power outages, sometimes we spend some 200,000br of fuel for electric generators”.*

*INT 6 “We have a good electric power supply but we we don’t have a good internet connection”.*

*INT 7 “Most farms have their own boreholes and they have no water supply issues. Roads to farms are usually made by the farms themselves. There is a huge problem of power and telecommunication infrastructure”.*

### **Do you think you have made a right facility location decision?**

*INT 2 “It is a good thing that we are near Addis because we avoided lot of trouble when there was political trouble but the city is coming fast towards us, one day it could swallow us”.*

*INT 11 “We are far from the centre. Our facility could have been better if it was near the airport”*

### **How optimal are farm facility locations?**

*INT 7 “Most farms are located within 200 K.M radius as they need to be near the airport. They are also located 5-10Min from main Asphalt road. There are some farms in remote location such as Bahir-Dar. The farms locate in Bahir-Dar couldn’t send their produce direct from Bahir-Dar Airport as their production volume is low. Horticultural products from Bahirdar are then transported to Bole International Airport. Due to the distance and road quality, there is a 2% damage on products coming from Bahir-Dar”.*

### **Important points from from facility location interview**

Most were very unhappy with the electricity supply and also communication infrastructure at their facilities especially when it is far from Addis. After years of establishment, the interviewees were

asked if their facility location decision, which was made some 10-20 years ago was right. Most said that they believe that have made the best decision. Some believe that there could have been a better one but given the cost of relocation they don't dare to think about it. Most farms were chosen primarily because of their altitudes. The second thing that comes was proximity to Bole international Airport. Other things like road infrastructure, power supply, labour supply were also among the factors considered. There are few farms scattered in some parts of the country but the majority are gathered in small clusters around Addis.

#### **4.2.12 Data Analysis of Scrap Disposal**

When it comes to scrap disposal many organizations have a bulk of green waste and other worn-out parts and equipments used in the production process. Scrap disposal is one of the logistics activities as it involves the removal of waste such as used packaging materials, damaged plants, chemical containers etc.

In conducting the in-depth interview, some of the following questions were raised regarding scrap disposal. The subsequent answers are attached under each question.

##### **What constitutes your scrap?**

*INT “Worn out plastics from greenhouses, packaging materials, metal, and chemical containers”.*

##### **How do you dispose Scrap?**

*INT 4 “We use shredders to cut the green waste into pieces before it is damped for decomposition. Regarding metal wastes we sell them. We have difficulty in selling or disposing plastic waste from the green houses. If you import duty free items, it is difficult to dispose them within 10 years since their import”.*

### **Do you have scrap disposal machines or equipment?**

*INT 8 “We use chopper to downgrade the size of green waste. We use tractors to transport green waste. Collection is made manually”.*

### **How do you transport and dispose dangerous materials?**

*INT 4 “We have difficulty in disposing dangerous chemicals and fertilizers. There is no policy in the country to recycle such kind of hazardous products. We can't dispose them by our own. We simply keep them in a protected store. It is affecting or space utilization”.*

*INT 4 “As expired chemicals are not disposed, we have stored expired chemicals year after year. They are occupying space which could have been used for other purposes”.*

*INT 11 “We damage the container's of chemicals in order not to let people use them in case they find them”*

### ***Important points from scrap disposal interview***

Most plastics and metals scraps are sold. The green waste is usually composted. In-order to export to North America there are some certification requirements. One of the standards to get these certificates is a good, environmentally friendly waste management system. Most farms use manual labor to collect and dispose off scrap. Some use tractors to transport the scrap. Most farms have choppers to reduce the green waste into pieces. In Ethiopia there is no law that governs the disposal of dangerous chemicals. Most farms couldn't dispose of their chemicals because of this. In order to prevent these materials leaking into the atmosphere, or underground water they are kept in a protected containers or places. Some people were not happy because they can't dispose the dangerous chemicals. There is no policy in Ethiopia dictating the removal of dangerous chemical and pesticide waste. One particular respondent was very emotional when he expressed about the difficulty in disposing dangerous chemicals.

## CHAPTER FIVE

### SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATION

#### Introduction

In this final chapter, summary of findings, conclusions and recommendations are discussed. After examination of the interview conducted on the horticulture exporting companies, data analysis was made. The data analyzed has been presented here compared to the literature review and objective of the study.

#### 5.1 Summary of findings and conclusion

The aim of this research was to study the export performance of horticultural exporters in relation to the 12 logistics activities. The research questions were

- ★ What is the relationship between horticultural export performance and logistical activities?
- ★ What are the most important logistical activities in horticultural export?
- ★ How effective are logistics activities in the horticultural sector compared to other countries?
- ★ What are the trends in global horticultural export?
- ★ How have some logistics activities changed in the horticulture export sector in the past few years?
- ★ What can be done to improve the efficiency of logistics activities in the horticultural export sector?

After analysing the data, there was a very strong link between export performance and logistics activities. All logistical activities do not have equal influence on export performance. For example transport has been seen to constitute 40-60% of the cost of goods sold. The findings of the analysis show that having the right vehicles helps to make speedy, protected delivery with minimum cost.

Having old trucks reduces quality of product during shipment. The road infrastructure has seen a lot of improvement in recent years. Congested roads haven't been seen to cause a negative impact on delivery schedule and cost of shipment.

The flight destinations from Ethiopia to the rest of the world in terms of cargo transport are fewer. Most experts import their raw material and packaging materials from abroad. Inefficiencies in logistics of imported raw materials and packaging materials touches many areas of logistics activities.

Difficulty in importing spare parts needed for vehicle repair affect the exporter in making a scheduled shipment with low cost.

A delay in in delivery of packaging materials to the farms affects their inventory control, order fulfilment and production planning.

There are only a couple of companies providing transport service using cold trucks for the whole horticultural industry in Ethiopia. Unless the exporters their own vehicles to transport their shipment, it is difficult to get a good quality transport provider in Ethiopia.

There is a lack of good quality packaging materials in the local market. Packaging materials have a role to hold the horticulture product in shape during handling and shipment.

There is a huge reliance on manual labour and materials handling equipments are not being used. Pallets are not used in in warehouse or in transportation. This is creating a problem in in space utilization and using forklifts and other materials handling equipments.

The inventory carrying cost is high. Most farms hold a raw material inventory of 3 months or more. There is huge pile up of raw material stock. Carrying a lot of raw materials ties-up working capital, occupies space and increases the amount of waste.

There is capacity utilization problem in some farms. There is a gap to correct these problems using better management practices. Most farms are using less than 75% of their capacity.

There is a long lead time to import raw materials from abroad. Some companies are importing chemicals and pesticides with a short expire date. This is increasing the amount of wastage. Chemicals and pesticides are hazardous to the environment and hard to dispose.

Some organizations don't have a feedback system to get information about their performance from their customers. This is creating a gap in addressing customer satisfaction.

Electric and communication problems are common at facility locations. The situation in remote parts of the country is more severe. This is creating a problem in keeping products fresh.

There are expired chemicals and pesticides in many farms. These chemicals are occupying space and are posing hazards for the people and the environment.

There are few suppliers that supply raw materials such as fertilizers, pesticides, chemicals. This has forced many to divert to international suppliers. There is a high cost to source these raw materials in the local market. This is creating a lot of inefficiency in the industry.

Among the 12 logistics activities, transport, warehousing, packaging, procurement and facility location decisions are seen to play a big role in the Horticultural export industry in Ethiopia.

As explained by interview participants, Ethiopia can be seen as an emerging nation for horticultural export. Institutional capacities are being built and are in the process of development. Some experts complain about how the government institutes are handling the horticultural export sector. Others say Ethiopia is in a good progress and can't be compared to other countries like Kenya which has

many years of experience in the industry. As explained by exporters land and air transport is expensive in Ethiopia compared to other countries. Even though the availability of labour force is high in Ethiopia, the efficiency rate is low. Availability of raw materials and packaging materials is not a big issue in other countries while it is hard to find in Ethiopia. These two basic materials are affecting many logistics activities.

There is a tremendous improvement in Ethiopia's infrastructure development in the past few years. The improvement in the cargo terminal of Ethiopian airlines is seen by many as a big development. There were so many issues at Bole International Airport but most of the problems are resolved now.

Some horticultural farms are scattered over many places that it is not possible to provide utilities like power and electricity.

There is huge progress in using technology to reduce labour requirement in many European countries in the Horticulture industry. There is a very low use of machines and equipments to increase speed of movement and reduce labour cost.

Utilizing ships to export horticultural products by refrigerated containers has been a new trend in the international horticultural industry but it is not yet implemented in Ethiopia.

## **5.2 Recommendations**

Most of the recommendations that are given here focus on what the government institutes can do to alleviate problems in the horticultural sectors. Most of the factors hampering the performance of horticulture exporters are external and they are not within the control of the exporters. If these problems are addressed it will increase the competitiveness of Ethiopian Horticulture exporters in the international Market.

- ★ Horticulture producers should work hard to reduce their inefficiencies in demand forecasting, production planning, customer service and inventory control.
- ★ The lack of refrigerated trucks and spare parts for these trucks should be addressed.
- ★ Investment in the transport of horticultural products should be encouraged in order to alleviate or avoid the problem in finding a good service providers in this sector.
- ★ There is a very high cost of air freight in Ethiopia. Small scale exporters have difficulty to export their flowers to Amsterdam. The aviation authority should find a solution to make the industry competitive.
- ★ Raw materials shortages is severe in the local market. Unless more suppliers enter into this business the performance of the horticultural export will remain weak.
- ★ There are no packaging material which fulfill the quality standards in Ethiopia. Investment in the sector should be encouraged. If investment in packaging materials is not made, horticulture exporters should also make efforts to establish one organization which can import or produce a constant supply of packaging materials.
- ★ Electrical and telecommunication access for the horticulture producing farms should be ensured in-order to increase their competitiveness in the international market.
- ★ Policies and procedures should be made on how dangerous agricultural wastes on the farms should be disposed safely.
- ★ The importing process of materials into the country should be more efficient not only for the efficiency of the horticultural industry but also the good of the nation at large.
- ★ Government institutions which are closely working with the Horticultural sector should strive to improve their institutional capacity.

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# Appendix 1

## INTERVIEW GUIDE FOR INDIVIDUAL IN-DEPTH INTERVIEWS

### **Dear respondent:**

My name is Estifanos Fikru. Thank you for allowing to conduct this interview. I'm a prospective graduate student at Addis Ababa university college of commerce. I'm writing a Thesis on "Analysis of the performance of horticultural exporters in Ethiopia: A logistics perspective" as a partial fulfillment of a degree of Masters in Logistics and supply chain management.

The interview will focus on logistical activities in relation to your export performance. I promise that the responses you provide here will remain confidential.

**Date** \_\_\_\_\_ **Duration of interview- Started at** \_\_\_\_\_ **End** \_\_\_\_\_

### **Here are some conditions that you may have to know**

You can leave the questions that you don't want to answer.

You may stop the interview at any time if you don't want to proceed or need to have a break.

If you agree, I would like to tape record the interview.

### **General Questions:** Would you please tell me

1. Your Name?
2. Your age if you don't mind?
3. Your Position in the organizations?
4. Your education background?
5. What your main businesses are?
6. How long have you been in the Industry?

## **Logistics related questions based on the 12 logistical activities**

### **Transport**

How do you assess the transport infrastructure in Ethiopia in relation to horticultural export performance?

Do you use your own trucks for transportation or do you outsource the service?

If you outsource transportation service, are there good service providers in the Market?

What is the average age of your trucks?

Are there spare parts and repair service providers for your refrigerated trucks?

Do you use fleet management systems?

Do you have product quality issues related to transportation?

What is per unit road and air transportation cost?

Do you think there is a need for another mode of transport in Ethiopia for horticultural export?

What transportation issues do you have?

What should be done to solve the problem?

### **Warehouse/Store**

Are your warehouses fitted with appropriate refrigeration system?

Are the warehouses fitted with loading and unloading machines like forklifts and cranes?

Are your warehouses wide enough for required operations?

How do you evaluate the quality of warehousing service at Addis Ababa international airport?

What warehousing/ pack house issues do you have?

## **Packaging**

How do you source packaging materials?

What role does packaging play in product quality?

What is the rate of product damage due to packaging problems?

What is the percentage of packaging cost in comparing to final product cost?

What should be done to solve packaging issues?

## **Materials handling**

Are warehouse/stores designed in such a way to use materials handling equipments?

How do you source your materials handling equipments?

How much automated is you materials handling?

How important are material handling equipments in the horticulture industry?

## **Inventory Control**

How different is inventory control in the horticulture industry?

What is you demand forecast accuracy rate?

How high is your inventory carrying cost?

What are the challenges of inventory management in he horticulture industry, how is it possible to solve the problem?

## **Order fulfilment**

How much of your products are direct order and how much are sold by auction?

How much percentage of your products are shipped on time from the direct order?

What are the major cause of delays in fulfilling order?

What is the average time from order to delivery?

How much percent of your products are delivered damage free?

What percentage of your products are delivered with correct documentation?

### **Demand forecasting**

What are the factors that affect demand forecasting?

How accurate were your demand forecasts when compared to actual sales?

Do you monitor competitive activities in order to make a better forecast?

What is your long term capacity requirement forecasting accuracy?

How difficult is it to make forecasts in your industry?

### **Production planning**

What factors do you include in production planning?

What supplies do you need in production planning?

Do you have issues in obtaining those supplies?

What is the per unit cost of labour and how is it compared to other countries?

How efficiently do you use your production capacity?

What is the percentage of waste? What do you do to reduce waste?

### **Procurement**

What are your procurement strategies?

What takes the bulk of your purchase?

What procedures do you follow to select suppliers?

Are there enough suppliers in the local market that supply herbicide and pesticide?

What percentage of your purchase comes from abroad?

What are your rate of emergency purchases?

What measures do you take to reduce procurement costs?

How long are the lead time?

What procurement issues do you have and what should be done to solve the problem?

### **Customer services**

Who are your customers?

What are your call and email return rates?

How do you measure customer satisfaction?

What is your customer retention rate?

### **Facility locations**

what were the major factors considered to choose your farm location?

Where are your farms located?

How is your facility location affecting your export performance?

What is the role of the investment commission in facility location?

What are the problems at your facility locations?

### **Scrap disposal**

What constitutes your scrap?

Do you have a scrap disposal facility?

Do you have scrap disposal machines or equipment?

What combination of machines and labour do you use in scrap disposal?

How do you transport and dispose dangerous materials?

To what extent do you recycle or reuse waste?

**What other things can you tell me regarding logistics or any other issue in your industry or organization that you want to be addressed?**