SUPPLY CHAIN MANAGEMENT PRACTICES ADOPTED BY THE KENYA-DUTCH FLOWER TRADE

BY

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AUGUST 2013

DECLARATION

I declare that this is my original work and has not been submitted for examination in any other University.

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This proposal has been submitted for examination with my approval as the University supervisor.

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DEDICATION

I dedicate this study to my loving parents Dr. Wellington Otieno and Susan Otieno for their consistent support all round. Their patience gave me the will to succeed. I owe my success to them.

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My gratitude goes to my Supervisor, family, colleagues, friends and all those who contributed tremendously towards my completion of this Research Project.

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ABSTRACT

The Kenya cut flower industry dates back to the late 1960s but it was not until the 1990s that investment transformed it into a major player in the international market. With an annual growth rate of 20 percent the cut flower industry is among the fastest growing sectors of the Kenyan economy. With revenues of more than USA Dollar (USD) 250 million a year, it is Kenya's second largest agricultural foreign exchange earner after tea (Fairtrade, 2012). Kenya is now the fifth largest flower exporter in the world. Ninety per cent of all Kenyan flowers are exported to Europe and Kenya also supplies 25 percent of cut flowers sold in the European Union (EU).

The study investigates the adoption of supply chain management practices in the Kenya-Dutch flower trade. The study used descriptive research design and drew its population from 50 registered members of the Kenya Flower Council (KFC) exporting to the Dutch market as at August 21, 2013, 4 flower handling freight companies and 1 distributor. Primary data gathered with the help of a structured questionnaire was analyzed using percentages, mean scores and standard deviations to enable comparison.

The results show that the strong growth in export volumes in the Kenya-Dutch flower trade has put pressure on the supply chain, creating bottlenecks that hamper efficiency and adoption of supply chain management practices. Other opportunities for further improvement in the efficiency of the supply chain are directly linked with changing market conditions and the different requirements of supplying the mass-market as opposed to supplying the traditional market.

CHAPTER ONE: INTRODUCTION

1.1 Background

The term supply chain management was coined by a consultant Keith Oliver, of strategy consulting firm Booz Allen Hamilton (Hamilton, 1982). Tan et al (1999) contends that the concept of Supply Chain Management is based on two core ideas. The first is that practically every product that reaches an end user represents the cumulative effort of multiple organizations. These organizations are referred to collectively as the supply chains. The second idea is that while supply chains have existed for a long time, most organizations have only paid attention to what was happening within their "four walls." Few businesses understood, much less managed, the entire chain of activities that ultimately delivered products to the final customer.

The result was disjointed and often ineffective supply chains. Supply chain management is therefore the active management of supply chain activities to maximize customer value and achieve a sustainable competitive advantage. It represents a conscious effort by the supply chain firms to develop and run supply chains in the most effective and efficient ways possible. Supply chain activities cover everything from product development, sourcing, production, and logistics, as well as the information systems needed to coordinate these activities (Tan et al, 1999).

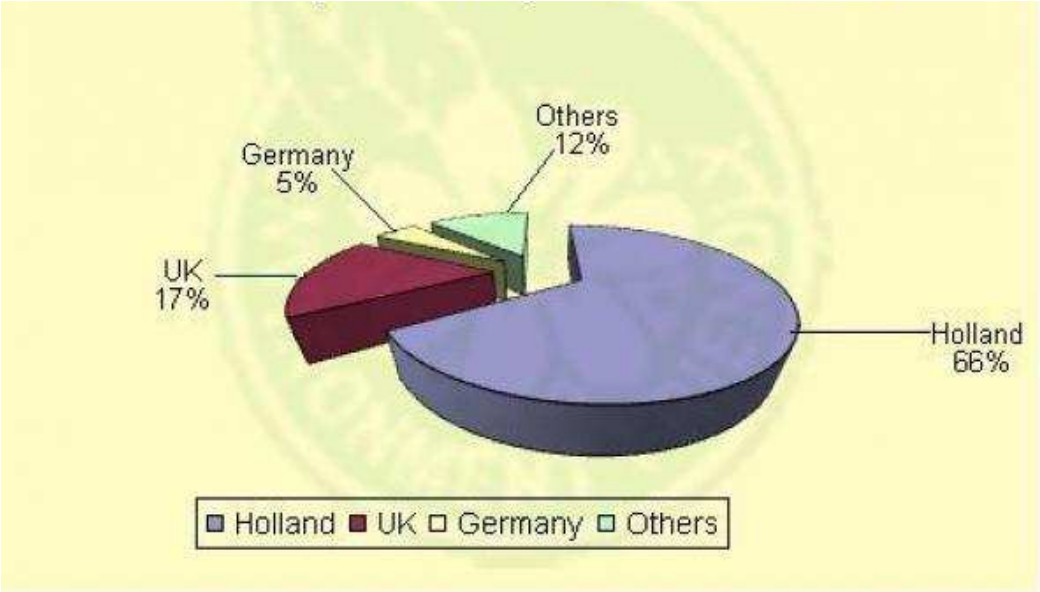
High value crops like cut flowers only fetch premium prices when they make it to the markets quickly and in the best possible shape. More often than not, cut flowers arrive in the Netherlands at temperatures that are too high because of inefficient supply chain management. The supply chain starts at the farm. If the quality of cut flowers that feeds into the supply chain is compromised, the entire supply chain can at best only maintain this input quality. Kenya has faced supply chain disruptions since the year 2007 (Omondi, 2011). The supply chain management practices in the Kenya-Dutch flower trade are: Cold chain packaging standards and protocols; Synchronisation of electronic information; and Education on cold chain management and packaging.

1.1.1 Kenya Cut Flower Industry

The Kenya cut flower industry dates back to the late 1960s but it was not until the 1990s that investment transformed it into a major player in the international market. With an annual growth rate of 20 percent the cut flower industry is among the fastest growing sectors of the Kenyan economy. With revenues of more than USA Dollar (USD) 250 million a year, it is Kenya's second largest agricultural foreign exchange earner after tea (Fairtrade, 2012). Kenya is now the fifth largest flower exporter in the world. Ninety per cent of all Kenyan flowers are exported to Europe and Kenya also supplies 25 percent of cut flowers sold in the European Union (EU).

The main flower growing areas in Kenya are regions around Lake Naivasha, Kinangop, Nakuru, Mt. Elgon, Kitale, Eldoret, Kericho, Limuru, Kiambu, Athi Plains, Thika, and Mt. Kenya region (HCDA, 2011). Figure 1 shows the main destinations for Kenya flower exports. Sixty six percent of the exports go to the Netherlands, which dominates the trade in cut flowers worldwide through its auction halls where Dutch wholesalers buy flowers for re-export to markets as far away as the United States and Japan. United Kingdom accounts for seventeen percent of Kenya's exports to the European Union, making it the country's second largest export market.

Figure 1: Kenyan Flower Export Destinations



Source: Kenya Flower Council (2012)

The floriculture industry continues to attract investors due to solid infrastructure, favourable climate, global positioning of Kenya and a productive workforce. It comprises large, medium and small scale farmers who have attained high management standards and have invested heavily on technical skills, production, logistics and marketing. It is estimated that over 500,000 people (including over 90,000 flower farm employees) depend on the floriculture industry (Kenya Flower Council, 2013).

1.1.2 Kenya-Dutch flower trade

Focusing on the Kenyan-Dutch flower trade, the Netherlands buys 66 percent of Kenya's floricultural export tonnage and over 55 percent of the export value. This has been the reason behind the tremendous export growth over the last two decades (Hortiwise, 2012). This growth has put pressure on Kenya's flower export supply chain, creating bottlenecks that hamper efficiency and further development. Additionally, small and medium sized (SME) producers in Kenya with less than about 10 hectares of production are finding it increasingly difficult to access efficient supply chains in order to get their products to the European market.

Considering the perishable nature of flowers, huge logistics are needed to transport them and the high weight to the value ratio makes them costly to transport. Rao (2006) stated that producers in third world such as Kenya will incur huge international loss by failing to meet the timely delivery of flowers due to inefficient supply chain management. Air connection is a huge challenge for producers located far from their markets. For instance, air freight, handling, and marketing costs in Europe accounted for 50 and 62 percent of Kenyan flowers (ABN AMRO records, 1995). These challenges adversely affect the supply chain management of the Kenya-Dutch flower trade.

1.2 Statement of the Problem

The Kenya floricultural supply chains have been unable to display consistency and stability in performance (World Bank, 2010). The supply chains have frequently experienced costly discontinuities in the current dynamic markets and vastly changing technological environments. According to Mckinnon et al (2010), the floriculture supply chains are inflexible and susceptible to disruption since they are unable to swiftly and suitably respond to emerging international protocols, certification requirements, and to governmental and regulatory changes. All these

signs are symptomatic of supply chains typified by disruption (Toigo, 2006). When the floriculture supply chains are disrupted, the economic fundamentals are affected since horticulture is one of Kenya's chief exports (World Bank, 2010).

The absence of adequate standards and protocols in the Kenya-Dutch flower trade, most notably, directly affects the quality and vase life of flowers. Temperatures right down the supply chain vary substantially and are often far higher than necessary, both in Kenya and in the Netherlands. The absence of clear agreements regarding temperature, as well as timing and quality of handling services (service levels), also negatively impacts flower quality.

Currently, the Kenya-Dutch supply chain lacks standard procedures for ordering, storing and erecting boxes, while packaging requirements related to storage, cooling and transport, are often contradictory. Also, loading practices and shipments are often inefficient, with over- and under-packing resulting in volume inconsistencies, unnecessary expenses and damage to flowers. The agency in Kenya with mandate to protect Kenya's agriculture from pests and diseases that could impact upon the environment, economy and human health KEPHIS' electronic service for phytosanitary issuance and E-freight (electronic messaging in the air cargo supply chain), needs to be developed and implemented on wider scale. Current flower shipments often lack uniform documentation and labelling, while some of the parties involved in clearing shipments are not available 24/7.

Change in the Kenya government, long-standing problems of poor governance, labour unrest, power shortages, and high utility costs continue to affect the supply chain management practices adopted in the Kenya-Dutch flower trade. Despite this environment, the strength of the flower sector has been particularly impressive.

Awour (2012) carried out a study on the conceptual model for managing supply networks for simultaneous optimisation in a complex adaptive environment: A case of the floriculture industry in Kenya. Kosgey (2011) carried out a study to investigate the critical quality issues that pose challenges in the horticulture industry. Kangogo (2013) in his study of Supply Chain Distribution in the floriculture industry in Kenya: A case study of Equator Flower Ltd found out that natural

disasters are the highest cause of supply chain disruption in the Kenya floriculture industry. Moenga (2011) carried out a study to establish the supply chain management practices and challenges for the small scale tea sector in Kenya. Abdifatah (2012) carried out a study on Supply chain management practices and their impact on performance among humanitarian organizations in Kenya. Omwenga (2007) carried out a study on Kenya's competitiveness in the floriculture industry: A test of Porter's competitive advantage of nations model.

It is quite clear from the foregoing that very little research has been done on the supply chain management practices adopted by the Kenya-Dutch flower trade, yet this is Kenya's largest export market and it is through improved supply chain management practices that cut flower trade would increase and make the industry sustainable and profitable, earning Kenya more foreign exchange currency.

This study therefore seeks to investigate the supply chain management practices adopted by the Kenya-Dutch flower trade; its inefficiencies and bottlenecks that need to be addressed for further growth. The research questions for the study are: What is the level of adoption of supply chain management practices in the Kenya-Dutch flower trade? What are the challenges faced in the adoption of supply chain management practices in the Kenya-Dutch flower trade?

1.3 Objectives of the Study

The main objective of this research is to investigate the supply chain management practices adopted by the Kenya-Dutch flower trade.

The specific objectives are:

i. To establish the level of adoption of supply chain management practices in the Kenya-Dutch flower trade.
ii. To investigate the challenges faced in adoption of supply chain management practices in the Kenya-Dutch flower trade.

1.4 Importance of the Study

The investors and managers in the floriculture industry will benefit from insights into what it takes the industry to thrive and how to leverage the supply chain management practices in the country to their advantage.

Government Institutions and industry associations like Horticultural Crops Development Authority (HCDA), Kenya Plant Health Inspectorate Services (KEPHIS), Fresh Produce Exporters Association of Kenya (FPEAK) and Kenya Flower Council (KFC) will find the information useful by identifying the weaknesses in supply chain management in the floriculture industry and come up with possible solutions that will enhance the Kenya-Dutch flower trade.

The study stands to benefit future researchers, scholars and academicians interested in the subject of supply chain management and indeed contribute to the body of knowledge in the subject.

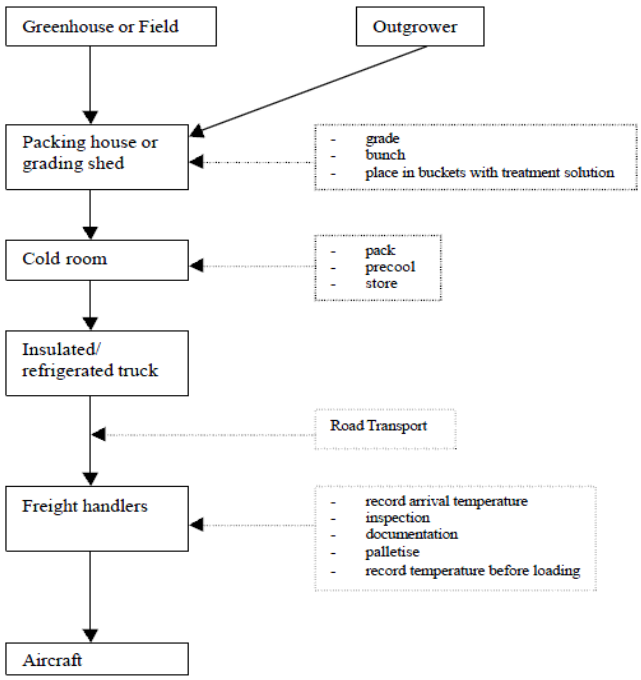
CHAPTER TWO: LITERATURE REVIEW

This chapter considers literature relevant to the subject under study. The main issues under review were: Supply Chain Management Practices; Supply Chain Management Practices adopted in the Kenya-Dutch flower trade; Industry players in the Kenya cut flower trade; and review of related studies.

2.1 Supply Chain Management Practices

The supply chain management complexities of the floriculture industry include: extremely short shelf life; very specific cycles with extreme peaks; mixing characteristics of service and product dimensions; and the challenge of operating part of 'first world' supply network in a developing economy. This creates the need for optimisation of the supply chain networks (Awour, 2012). Figure 2 describes the domestic part of the export supply chain. The largest flower companies have vertically integrated most of, and in at least one case, all of the functions indicated in the figure below.

Figure 2: Supply Chain for Kenyan Cut Flowers from field to aircraft



Source: Thoen et al. (2013)

Modern supply chains are dynamic and interconnected networks that are gradually lengthening and globe-spanning (Christopher & Peck, 2008). The expansion and the internationalization of the supply chains translate them from the simply linear structures into an endless and complex system susceptible to disruption. According to Hendricks and Singhal (2011), disruptions in the supply chain at global level devastate corporate performance.

According to Mckinnon et al (2010), logistics is a key function in the supply chain as it acts as a physical link between customers and suppliers, the firm and its markets; and it enables the flow of materials and resources. A poorly designed logistics chain is unable to accommodate uncertainties and is bound to cause supply chain disruption (Mckinnon et al, 2010). Natural disasters cause devastating disruptions of floricultural supply chains (Craighead, 2011). The eruption of Iceland's volcano in 2010 affected Kenya's floricultural supply chains causing losses in millions of dollars. Labor union actions such as strikes disrupt the supply chains since they cause supply-demand disharmonies within the floriculture supply chains (Mckinnon et al, 2010).

2.2 Supply Chain Management Practices adopted in the Kenya-Dutch flower trade

High value crops like cut flowers only fetch premium prices when they make it to the markets quickly and in the best possible shape. More often than not, cut flowers arrive in the Netherlands at temperatures that are too high because of inefficient supply chain management. The supply chain starts at the farm. If the quality of cut flowers that feeds into the supply chain is compromised, the entire supply chain can at best only maintain this input quality. Kenya has faced supply chain disruptions since the year 2007 (Omondi, 2011). The supply chain management practices in the Kenya-Dutch flower trade are: Cold chain packaging standards and protocols; Synchronisation of electronic information; and Education on cold chain management and packaging.

The absence of adequate standards and protocols in the cold chain, most notably, directly affects the quality and vase life of flowers. Temperatures right through the supply chain vary substantially and are often far higher than necessary, both in Kenya and in the Netherlands. The absence of clear agreements regarding temperature, as well as timing and quality of handling services, also negatively impacts flower quality. Currently, the supply chain lacks standard procedures for ordering, storing and erecting boxes, while packaging requirements related to

storage, cooling and transport, are often contradictory. Further, loading practices and shipments are often inefficient, with over- and under-packing resulting in volume inconsistencies, unnecessary expenses and damage to flowers (Hortiwise, 2012).

A more effective exchange of (electronic) information throughout the supply chain will reduce time to market and handling expenses, increasing supply chain efficiency. Electronic systems, such as CLIENT (a Dutch system for phytosanitary checks), KEPHIS' electronic service for phytosanitary issuance and E-freight (electronic messaging in the air cargo supply chain), need to be developed and implemented on wider scale. Current flower shipments often lack uniform documentation and labelling, while some of the parties involved in clearing shipments are not available 24 hours. Cold chain management and packaging are also begging attention when it comes to education. Farm personnel, transporters, handlers, airlines and importers alike are not as aware as they should be of the basic requirements in these areas, nor how to meet them (Hortiwise, 2012).

2.3 Industry players in the Kenya cut flower trade

The main industry players in the Kenya cut flower trade include: Horticultural Crop Development Authority (HCDA), Kenya Plant Health Inspectorate Services (KEPHIS), Kenya Flower Council (KFC), National Environmental Management Authority (NEMA) and Fresh Produce Exporters Association of Kenya (FPEAK).

Horticultural Crop Development Authority (HCDA) is the Government's regulatory agency for the horticultural sub-sector. Its mandate is to regulate the horticulture industry through licensing and application of rules as prescribed under the Agriculture Act, Cap 318. HCDA also provides advisory and marketing services to the stakeholders in the industry for planning purposes.

Kenya Plant Health Inspectorate Service (KEPHIS) is a State Corporation in the Ministry of Agriculture mandated to assure the quality of agricultural inputs and produce to promote sustainable agriculture and economic growth. KEPHIS coordinates all matters relating to crop pests and disease control, advises the Director of Agriculture on appropriate seeds and planting materials for export and import.

Kenya Flower Council (KFC) is a voluntary association of independent growers and exporters of cut-flowers and ornamentals. It was formed in 1996 with the aim of fostering responsible and safe production of cut flowers with due consideration of workers welfare and protection of the environment. KFC also has a code of regulations to be observed by flower farms.

The National Environment Management Authority (NEMA) was established under the Environmental Management and Coordination Act (EMCA) No. 8 of 1999, as the principal instrument of government in the implementation of all policies relating to the environment. NEMA is mandated with the responsibility of conducting environmental audits before a flower farm is given the go ahead to establish their activities. NEMA works with flower farms to safeguard and enhance the quality of the environment through coordination, research, facilitation and enforcement, while encouraging responsible individual, corporate and collective participation towards sustainable development.

The Fresh Produce Exporters Association of Kenya (FPEAK) is Kenya's premier trade Association representing growers, exporters and service providers in the horticulture industry. FPEAK provides a focal and coordination point for the horticulture export industry.

2.4 Review of Related studies

Kangogo (2013) in his study of Supply Chain Distribution in the floriculture industry in Kenya: A case study of Equator Flower Ltd found out that natural disasters are the highest cause of supply chain disruption in the Kenya floriculture industry. These natural disasters are mainly volcanic activity, harsh weather, earthquakes, tsunamis, hail storms, heavy rains and drastic change of weather. The natural disasters affecting the supply chains are not restricted those that occur in-country. The floriculture supply chains are global. Natural disasters affecting the market countries are translated into local effects. The natural disasters that hit the source countries of input supplies also lead to impacts on the supply chains meaning that the productivity activities in the farm are delayed. The impact on the inputs supply chain has multiplier effects in terms of the delayed products supply chain.

Moenga (2011) carried out a study to establish the supply chain management practices and challenges for the small scale tea sector in Kenya. The study found out that, although the small scale tea sector appreciates good supply chain management practices, the same has not been put into practice. The sector has not established long term relationships with its suppliers who operate along its supply chains as was evidenced by the frequent seeking of suppliers through tenders. The supply chains in the sector were also found to be too long involving several stages which increase operating costs. The sector was found to face several challenges which threaten its long term growth and survival, the most worrying challenge being the continued rising labor and other operating costs. The sector and the tea industry in general, has always grown and contributed to the development of this country and therefore with some improvements in its supply chains and challenges, the sector can become very stable and competitive in the international markets.

Logistics process design is a strong cause of disruption in the floriculture supply chains. The road transport means is not reliable and is subject to frequent discontinuities. There are recurrent truck breakdowns and traffic jams that lead to delays of the produce reaching the airports. These culminate in supply chain breakdown where the produce is actually composted. The road transport also leads to a reduction in the vase life of the flowers. The offloading and on-loading of the flowers also causes damage to the product. The customers are very precise on the delivery quality of the product. Within the farm, the packaging is sometimes not done correctly since the process is manually driven and hence not easy to enforce seamless standardization. The process is prone to man-made errors. Storage is also an issue since during peak harvests there are capacity issues with the cold rooms. Overall, the main components of the floriculture logistics process design that cause the supply chain disruption are road transport, air transport, packaging and storage. Sea transport was found to be a less significant factor disrupting the floriculture supply chains (Kangogo, 2013).

A study on the Kenyan-Dutch Horticultural Supply Chain commissioned by the Dutch Ministry of Economic Affairs, Agriculture and Innovation and performed by leading Dutch expertise centres Hortiwise and FlowerWatch, states that the Kenya-Dutch horticultural supply chain is evolving towards lean and transparent supply chains characterized by consolidation and vertical

integration. ‘The overall conclusion of the study,’ says Jeroen van der Hulst, Director of FlowerWatch, ‘is that the Kenyan-Dutch supply chain has reached the point at which it is struggling with the weight of its own success. The finding of the study shows that the strong growth in export volumes has put pressure on the supply chain, creating bottlenecks that hamper efficiency and further development. Other opportunities for further improvement in the efficiency of the supply chain are directly linked with changing market conditions and the different requirements of supplying the mass-market channel as opposed to the traditional florist channel.

Abdifatah (2012) carried out a study on Supply chain management practices and their impact on performance among humanitarian organizations in Kenya. The study findings indicated that maintaining good supplier relation, effective and efficient internal operations, continuous improvement, flexible production processes, use of technology to speed up humanitarian work, inter-organization integrations and simplicity in internal operations are among the practices prevalent among humanitarian organizations in Kenya.

Omwenga (2007) carried out a study on Kenya’s competitiveness in the floriculture industry: A test of Porter’s competitive advantage of nations model. The study determines whether Kenya‘s flowers are competitive in the world market on the one hand and whether this competitiveness can be explained by the factors in Porter‘s diamond model on the other hand. The results show that Kenya‘s flowers are competitive in the global market and that this can be attributed to factor conditions, the investment friendly Kenyan culture and good climate, government policy, supporting local organizations and the deliberate involvement of flower firms in marketing and corporate strategies.

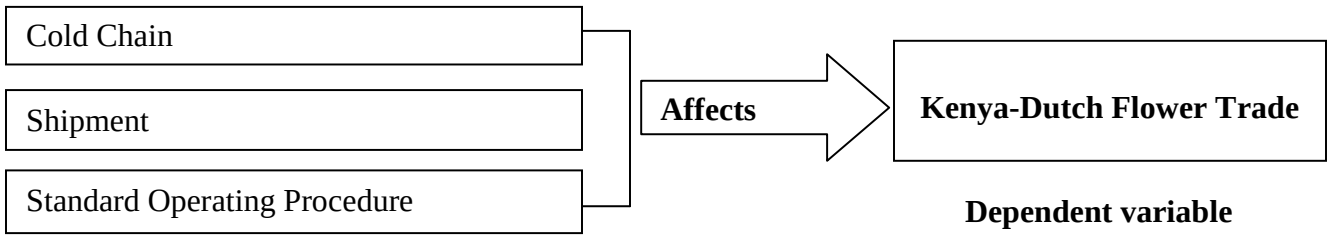
2.5 Summary and Conceptual Framework

Saxena and Sircar (2009) broadly classified the supply chain management (SCM) framework components into three parts: upstream, internal and downstream. The upstream supply chain is mainly concerned with procurement of raw materials, internal supply chain concerned with transforming inputs into outputs and the downstream supply chain concerned with delivery processes of the finished products to the final consumer (Bailey et al, 2005). In the face of

continuing globalization and complexity of the international business environment it is vital that supply chain managers gain a lot more clarity on the practices causing supply chain management. Supply chain management has caused the decline of many business enterprises, including the floriculture industry in Kenya, and affected many livelihoods across the globe. In this regard, supply chain managers need to gain deep practical understanding on the dynamics of the root causes of such disruptions so as to be better placed to craft preventive and remediation strategies. Shah (2009) indicates that supply chain uncertainty and disruption have not received enough attention in the contemporary supply chain literature.

This study will be guided by the following conceptual framework on the supply chain practices that affect the Kenya – Dutch flower trade.

Figure 3: Conceptual Framework



Source: Researcher 2013

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Research Design

The study will use descriptive research design. Descriptive research design helps provide answers to the questions of who, what, when, where, and how associated with a particular research problem. Descriptive research is appropriate for this study because it enables collection of data from members of the population, interpreting and establishing a relationship between the variables and their significance.

3.2 Population

The population of the study will comprise of: Growers, Freight companies and the distributor. They population is 55 in total distributed as: 15 small scale, 25 medium scale and 10 large scale. The flower handling freight companies are 4 and 1 distributor. Appendix II shows the list of KFC members, Appendix III shows the list of flower handling freight companies and Appendix IV shows the distributor. The study will be a census as the population is small with only a few players.

3.3 Data Collection

The study will use primary data as this allows for data to be collected for a specific research problem using procedures that best fit the research problem. Primary data is data which was previously unknown and is obtained directly by the researcher for a particular research project. It is obtained directly from first hand sources by means of survey, observation or experimentation.

Primary data will be obtained through a structured questionnaire which is a research instrument consisting of a series of questions and other prompts for the purpose of gathering information from respondents. The questionnaire consists of two parts: Part A of the questionnaire gathers the firms' general information while part B elicits the supply chain management practices adopted by the Kenya-Dutch flower trade.

The questionnaire will be self administered because the population is literate hence able to read and comprehend the questions. The questionnaires will be left with the respondents to fill in before being collected. The advantage of this approach is that it reduces interviewer bias and is

perceived as more anonymous and may therefore yield more accurate data on sensitive issues. The challenges include: low response rate and possible clarity issues. The respondents of the questionnaires will be the supply chain managers or their equivalent.

3.4 Data Analysis

The data obtained will be organized and analyzed using descriptive statistics which include: mean, percentages and frequency table. Descriptive statistics provides simple summaries about the sample and the observations that have been made.

Data obtained using the likert scale will be used to calculate the mean of the supply chain management practices adopted by the farms exporting to the Dutch flower market. This will provide information on measures to be taken to address the inefficiencies and bottlenecks of the Kenya-Dutch flower trade supply chain.

Percentages will be used to show the distribution of supply chain management practices in the Kenya-Dutch flower trade. The percentages will be used to make comparisons to determine the intensity with which certain practices contribute to an effective supply chain management.

In interpreting the results, the frequency with which the data appears will be interpreted as a measure of importance, attention or emphasis using frequency tables. A frequency table shows the distribution of scores in a sample for a specific variable (Mugenda and Mugenda, 1999).

CHAPTER FOUR: DATA ANALYSIS AND FINDINGS

This chapter contains summaries of data findings together with their interpretation. The study analyses primary data on Kenya-Dutch flower trade, general information about flower firms, supply chain management practices adopted in the Kenya-Dutch flower trade, supply chain factors, benefits of using IT systems, and general challenges.

4.1 Response Rate

A total of fifty (55) questionnaires were distributed to the respondents, out of which fourty (40) responded by completing and returning the questionnaires. Fifteen (15) did not respond. This gave a response rate of 73% and a non-response rate of 27% as shown in Table 4.1. This response rate was favorable according to Mugenda and Mugenda (2003) in which they assert that a 50% response rate is adequate, 60% good and above 70% rated very well. The questionnaires were edited for completeness and consistency and data analyzed using percentages, mean scores and frequency distribution tables so as to facilitate and enable comparison. The findings are presented and analyzed below. Table 4.1 shows the

Table 4.1: Response Rate

	Frequency	**Percent**
Respondents	40	73%
Non - respondents	15	27%
	55	100%

Source: Survey data 2013

4.2 Duration of Operation in the Industry

The respondents were to indicate their duration of operation in the industry. Table 4.2 shows the duration in years the firms have been operating in the Kenya floriculture industry.

Table 4.2: Duration of Operation in the Industry

	Frequency	Percent
Less than 1 year	0	0%
1 - 3 years	13	32.5%
4 - 5 years	15	37.5%
6 - 10 years	8	20%
Over 10 years	4	10%
	40	100%

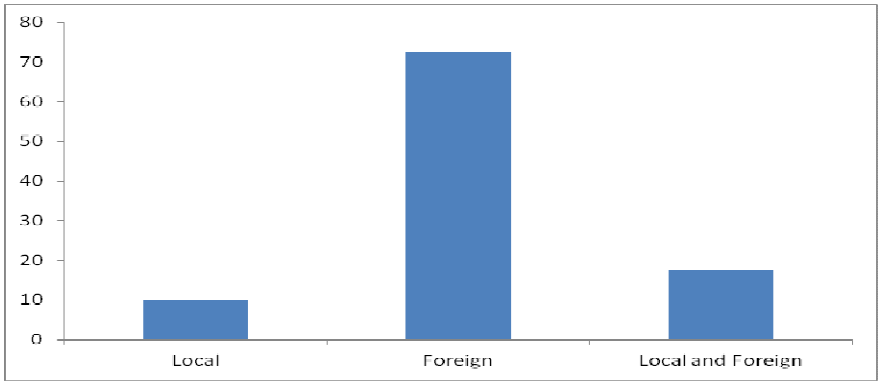
Source: Survey data 2013

The findings indicate that 0% of the firms have been in operation in Kenya for less than a year, 32.5% between 1-3 years, 37.5% between 4 – 5 years, 20% between 6 – 10 years and 10% over 10 years. This shows that majority of the floricultural firms had been in operation in Kenya for more than 3 years.

4.3 Ownership Structure

The respondents were to indicate the ownership structure of their firms. Figure 4 shows the ownership structure of the firms.

Figure 4: Ownership Structure



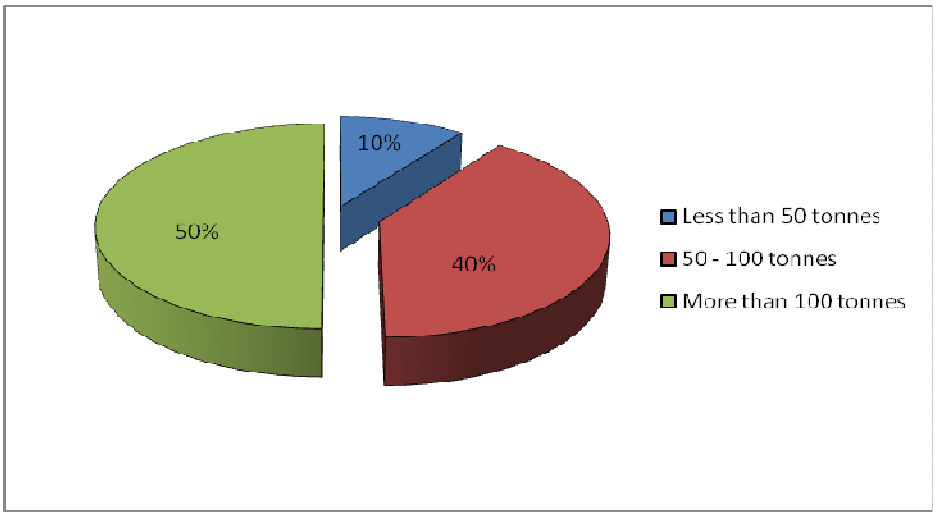
Source: Survey data 2013

From the findings, foreigners owned 73% of the firms, 18% owned by both the locals and foreigners while the locals purely owned only 9% of the firms. The results indicate that foreigners owned majority of these firms.

4.4 Output Volume

The respondents were to indicate their annual output volume in tones. Figure 5 shows the annual output in tones of the firms operating in the Kenya-Dutch flower trade.

Figure 5: Annual Output Volume



Source: Survey data 2013

From the findings, 10% of the firms had an annual output volume of less than 50 tonnes, 40% had between 50-100 tonnes and 50% had more than 100 tonnes. The results indicate that majority of the firms had high output volumes.

4.5 Supply Chain Management Practices

The respondents were to rate the extent to which their firms apply supply chain management practices. Table 4.5 shows the various supply chain management practices the firms have applied in their operations.

Table 4.3: Supply Chain Management Practices

	Mean	Std. Deviation
In close partnership with customers	4.48	0.59
Electronic Information Exchange	4.43	0.73
By outsourcing	4.35	0.49
By subcontracting	4.30	0.56
Using 3 PL	4.22	0.63
By strategic planning	4.17	0.67
Through supply chain bench marking	4.13	0.78
Through vertical integration	3.29	0.98
Through use of external consultants	3.45	0.55

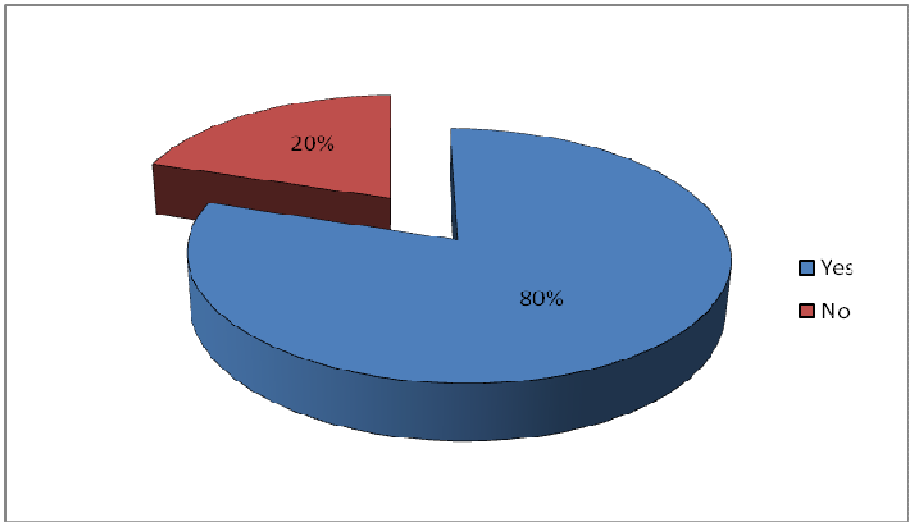
Source: Survey data 2013

From the findings the supply chain management practices applied in the Kenya-Dutch flower trade to a large extent are: close partnership with customers (4.48), Electronic Information Exchange (4.43), Outsourcing (4.35), Sub contracting (4.30), 3PL (4.22), strategic planning (4.17), supply chain benchmarking (4.13), and to a moderate extent are: vertical integration (3.29), use of external consultants (3.45). The standard deviations were relatively low indicating that most of the respondents were in close agreement.

4.6 Logistics Department

The respondents were to indicate whether their firms have a separate logistics department specifically handling supply chain and logistics matters. Figure 6 shows that 80% of the respondents indicated that they have a dedicated logistics department within their firms while 20% did not have a dedicated logistics department.

Figure 6: Logistics Department



Source: Survey data 2013

This finding was also reflective on the question of having a clear supply chain management policy for the organization with 80% of the respondents stating that they did have a clear supply chain management policy guiding their operations while 20% of the firms did not have a policy in place. Further the study also established that only 40% of the respondents used external consultants to develop their supply chain management policy while 60% of the respondents developed their supply chain management policies in house through management.

4.7 Supply Chain Factors

The respondents were to rate the extent to which the industry supply chain factors affect their firms. Table 4.7 shows the supply chain factors affecting firms in the Kenya-Dutch flower trade.

Table 4.4: Supply Chain Factors

	Mean	Std. Deviation
Standard Procedures	4.22	1.05
Cold chain	4.09	0.8
Phytosanitary checks	3.96	0.75
Export Documentation	3.51	1.19
Personnel Training	3.17	0.98
Cargo Handling	2.81	1.45

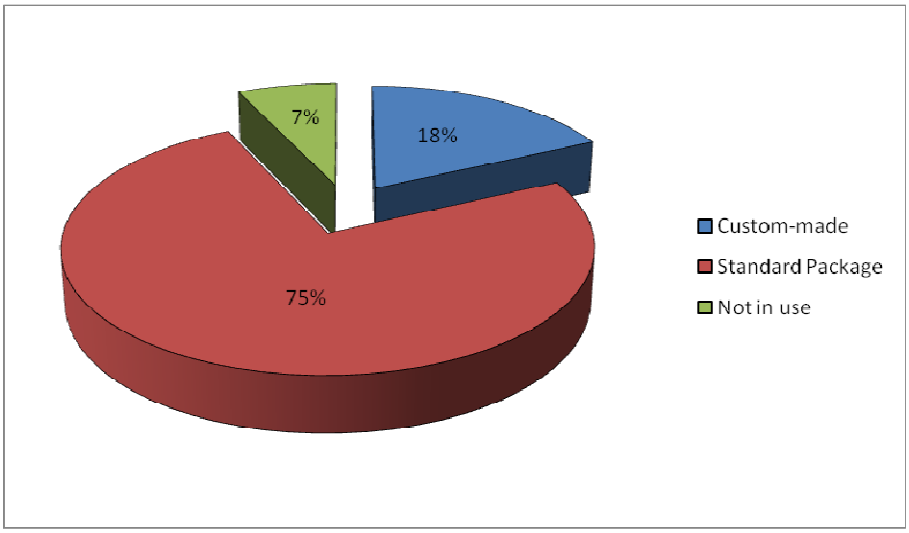
Source: Survey data 2013

From the findings the factors affecting the supply chain were highly attributed to Standard Operating Procedures (4.22), Cold chain (4.09) Phytosanitary checks (3.96), Export Documentation (3.51), Personnel training (3.17) and Cargo handling (2.81). The standard deviations were relatively low indicating that most of the respondents were in close agreement.

4.8 IT Systems

IT plays an important role in supply chain management practice. The respondents were to indicate which IT systems are in use in their company to support supply chain management and rate the extent to which these systems have benefit their organizations. Figure 7 shows the make of IT systems in use in the firms.

Figure 7: IT systems



Source: Survey data 2013

The results show that 75% of the respondents use standard package IT systems while 18% use custom made IT systems in their organizations. Only 10% of the respondents do not make use of any IT system.

4.8.1 Benefits of using IT Systems

The respondents were to rate the extent to which their firms benefit from using IT systems. Table 4.8 shows the supply chain factors affecting firms in the Kenya-Dutch flower trade.

Table 4.5: Benefits of using IT systems

	Mean	Std Deviation
Increased coordination with customers	4.58	1.11
Increased sales	4.43	1.09
Better quality of information	4.32	1.07
Reduced lead-time in production	4.21	1.01
Cost saving	4.12	0.90
Increased coordination between departments	4.00	0.90
Forecasting	3.98	0.56
Resource planning	3.54	1.14
Better operational efficiency	3.23	1.14
Reduced inventory level	2.96	0.76
More accurate costing	2.42	0.89

Source: Survey data 2013

The benefits of using IT systems to the firms included: Increased coordination with customers (4.58), Increased sales (4.43), Better quality of information (4.32), Reduced lead-time in production (4.21). Cost saving (4.12), Increased coordination between departments (4.00), Forecasting (3.98), Resource planning (3.54), Better operational efficiency (3.23), Reduced inventory level (2.96) and More accurate costing (2.42). The standard deviations were relatively low indicating that most of the respondents were in close agreement.

4.9 General Challenges

The respondents were to rate the extent to which the general challenges affect their operations. Table 4.9 shows the general challenges firms operating in the Kenya-Dutch flower trade face.

Table 4.6: General Challenges

	Mean	Std. Deviation
Working Capital	4.74	0.46
Euro Zone crisis	4.25	1.09
Infrastructure – Electricity, Poor Roads	3.87	0.9
Government policies	3.78	1.16
Natural Disasters – Floods, Drought	3.43	0.71
Foreign Exchange Currency fluctuations	3.35	0.69
Fuel Prices	3.13	0.87
International Standards – Fair trade, MPS	2.98	1.03

Source: Survey data 2013

From the findings majority of the firms faced challenges in acquiring working capital (4.74), the Euro Zone crisis has greatly affected their business (4.25), Infrastructure (3.87) and Government policies at (3.78). On the other hand, to a moderate extent Natural disaster (3.43), Foreign exchange fluctuations (3.35), Fuel prices (3.13) and International Standards (2.98). The standard deviations were relatively low indicating that most of the respondents were in close agreement.

4.10 Discussion of Results

A great majority (72%) of the respondents agreed that cold chain management affected the delivery of flowers whereas a few (28%) disagreed. The findings imply that cold chain has huge potential to affect the floricultural supply chains. These findings tally with the views of McKinnon et al (2010) who indicates that cold chain and road transport has the capacity to precipitate supply chain disruption.

Majority of the respondents (81%) indicated that they experience supply chain management practice challenges in the Kenya-Dutch flower trade whereas a few (19%) indicated that they do not experience supply chain management practices challenges. The findings show that supply chain management practices affect the floriculture supply chains significantly implying that they have great potential to cause disruption and result in significant loss of business and market share in the Kenya-Dutch flower trade. The findings agree with Christopher and Peck (2008) who stated that the florticulture industry has not invested in the latest supply chain management technologies which lead to enhanced probability of the produce reaching the customer in acceptable state. The findings however disagree with McKinnon et al (2010) who believes that supply chain management practices are not one of the leading causes of supply chain disruption.

An overwhelming majority (91%) of respondents agreed that natural disasters affected the floricultural supply chains. The respondents listed natural disasters such as earthquakes, harsh weather, hailstones, torrential rains and volcanic eruptions as affecting the farm. The findings imply that natural disasters do indeed happen and that they affect the floriculture supply chains with a potential to cause supply chain disruption. These findings corroborate those of Shah (2009), Goodwill (2011), Toigo (2006) and Craighead (2011) who assert that floriculture supply chains display vulnerabilities to natural disasters. The findings however contradict Fisher (2011) and Handifield (2011) who assert that with proper strategic planning, industries can significantly insulate their supply chains against the ravages of supply chain disruptions caused by natural and other disasters.

This empirical study had the overall objective of investigating the supply chain management practices adopted by the Kenya-Dutch flower trade. The research results are a strong pointer to the fact that cold chain, shipment and standard operating procedures are the main supply chain management practices that greatly contribute to the Kenya-Dutch flower trade. These research results support the views expressed by McKinnon et al (2010), and Shah (2009) on the causal and disruptive effects of supply chain management practices on the floricultural supply chains.

CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS

This chapter summarizes the conclusions, recommendations and suggestions for further research.

5.1 Conclusions

The main objective of this study was to investigate the adoption of supply chain management practices in the Kenya-Dutch flower trade. From the findings majority of the floricultural firms have been in operation in Kenya for more than 3 years and most of them are mainly foreign owned. This therefore explains the maturity with which they operate, borrowing heavily on technical knowhow, management expertise, sales and marketing strategies and implementation from Europe, Israel and America. From the findings most of the firms had high annual volume outputs of more than 100 tonnes per year; this therefore denotes that volumes traded in the Kenya-Dutch flower trade are one of the broad determinants of the supply chain management practices adopted in the Kenya-Dutch flower trade.

The main supply chain management practices largely adopted in the Kenya-Dutch flower trade are: close partnership with customers, Electronic Information Exchange, Outsourcing, Sub contracting, 3PL, strategic planning and supply chain benchmarking. Vertical integration and use of external consultants were rated as moderately adopted. The findings further indicated that majority of the flower firms had a dedicated logistics department and this was similar with the finding of an equal number of respondents indicated existence of a clear supply chain management policy. Further the study also established that supply chain policies were developed in house by the management vis-a-vis using external consultants.

The findings also indicated that Standard Operating Procedures, Cold chain and Phytosanitary checks were significant to the success of the Kenya-Dutch flower trade. This was indicated by the high rating the respondents gave to those particular factors. This is again consistent with the literature that the absence of adequate standards and protocols in the cold chain, most notably, directly affects the quality and vase life of flowers. Temperatures right through the supply chain vary substantially and are often far higher than necessary, both in Kenya and in the Netherlands.

The study established that majority of the firms who are using IT systems in their supply chain management process are benefiting greatly in terms of efficiency and effectiveness of their operations.

From the foregoing the general challenges facing the Kenya-Dutch flower trade can mainly be attributed to working capital, the Euro Zone crisis, Infrastructure and Government policies and to a small extent fuel prices and International Standards.

From the above discussion the study concludes that supply chain management practices adopted in the Kenya-Dutch flower trade will serve to increase the market share of the firms, diversify business growth, acquire state of art and technology, comply with new legislation, acquire brand loyalty and overcome entry barriers. The study also established that although majority of the flower firms use management to develop in house supply chain management policies, it is advisable for this function to be outsourced to external consultants so as to incorporate industry best practices as well as evolve with the dynamic industry changes and ever increasing stringent demands on export products.

The study further established that there is a need to create an industry supply chain protocol, cold chain when transiting on European airports requires improvements and the priority of handlers is to avoid dead-freight, which can harm the cold chain.

5.2 Recommendations

This study has established that the strong growth in export volumes has put pressure on the supply chain, creating bottlenecks that hamper efficiency and further development. Other opportunities for further improvement in the efficiency of the supply chain are directly linked with changing market conditions and the different requirements of supplying the mass-market channel as opposed to the traditional florist channel. Many supply chain inefficiencies are the result of a lack of communication and coordination between key actors in the supply chain. It is impressive to see how the industry has developed generally accepted ‘workarounds’ to bypass recognised problems, such as flight delays and flowers arriving at the airport at excessive temperatures.

In order to maintain their competitive edge over competitors both near and far in the global flower industry, Kenya and the Netherlands will need to address the following supply chain management practices: Cold Chain Management, Logistics, Communication and Packaging.

The study therefore recommends further development and implementation of IT systems in the Kenyan-Dutch flower trade like: CLIENT (Dutch electronic system for phytosanitary checks), KEPHIS electronic service for phytosanitary issuance and E-freight (electronic messaging in the air cargo supply Chain). The study also recommends a joint initiative between industry and Government regulatory bodies to develop an inclusive and credible industry-wide national compliance system, involving private stakeholders and the regulatory authorities. This will reduce logistical inefficiencies and serve to improve cold chain standards and protocols within the industry including monitoring compliance.

5.3 Limitations of Study

The study focused on the 55 flower firms exporting to the Dutch market registered with the Kenya Flower Council (KFC) as at August 31st 2013 and therefore cannot be used to generalize the adoption of supply chain management practices in the Kenya-Dutch flower trade in other flower firms who are not registered with KFC. The researcher‘s sample concentrated on firms around the main flower zones of Naivasha, Nairobi and Thika.

5.3 Suggestions for Further Research

The study focused on the 55 flower firms exporting to the Dutch market registered with the Kenya Flower Council (KFC) as at August 31st 2013. Future studies, however should be carried out in all parts of Kenya and the sampling frame cast wider to include non KFC member flower firms as this would better represent the overall floricultural industry. Although the supply chain management practices adopted in the Kenya-Dutch flower trade are generally considered highly efficient the government of Kenya needs to improve the cargo handling facilities at the Jomo Kenyatta International Airport government to be able to handle increasing volumes of export. A study comparing the supply chain practices adopted in other marketing channels to the United

Kingdom, America and Germany. This would help identify gaps in supply chain policy and their impact on the investment strategies in flower firms.

There are many flower firms concentrated around Lake Naivasha on account of its water supply. But with the expansion of the 4,000-acre flower farming sector on the lake, the population around the lake has grown in the past 20 years from about 7,000 to about 300,000. There is no legal framework guiding the use of water from Lake Naivasha. This is a serious threat not only to the flower firms but also to the lake itself. A study into the relationship between the lake and the flower firms would help the government come up with a legal framework guiding the use of the lake‘s water in the light of the increasing population of flower firms around it.

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APPENDICES

APPENDIX I: QUESTIONNAIRE

This questionnaire is intended to obtain information for a study on the supply chain management practices adopted by the the Kenya-Dutch flower trade.

Part A: General Information

Please indicate by ticking (√)

1. For how long have you been in operation in the floriculture industry in Kenya?

Less than 1 year	☐
1-3 years	☐
4-5 years	☐
6-10 years	☐
Over 10 years	☐

2. What is the ownership structure of your company?

Local	☐
Foreign	☐
Both local and foreign	☐

3. What is your annual output volume?

Below 50 tonnes	☐
50 – 100 tonnes	☐
100 tonnes and above	☐

Part B: Supply Chain Management Practices

1. Please indicate by ticking (√) the extent to which your company applies the supply chain management practices indicated by the statement.

Statement	Little Extent	Some Extent	Great Extent	Very Great Extent
	1	2	3	4
In close partnership with customers				
Electronic Information Exchange				
By outsourcing				
By subcontracting				
Using 3 PL				
By strategic planning				
Through supply chain bench marking				
Through vertical integration				
Through use of external consultants				

2. Does your company have a separate logistics department? YES ☐ NO ☐
3. Does your company have a clear supply chain management policy? YES ☐ NO ☐
4. Who develops the supply chain management policy in your company?

Management ☐
External Consultants ☐

5. Indicate the extent to which the following supply chain factors affect your supply chain management?

Factors	**Little Extent**	**Some Extent**	**Great Extent**	**Very Great Extent**
	1	**2**	**3**	**4**
Standard Procedures				
Cold Chain				
Phytosanitary Checks				
Export Documentation				
Personnel training				
Cargo handling				

6. What types of IT systems are currently in use in your company to support Supply Chain Management?

IT systems	**Custom-made**	**Standard package**	**Not in use**
Enterprise Resource Planning (ERP)			
Warehouse Management System (WMS)			
Supply Chain Management (SCM)			
Customer Relationships Management (CRM)			
Supplier Relationships Management (SRM)			
Advanced Planning System (APS)			
E-commerce			
E-freight			
Decision support / expert system			
Bar coding			

7. To what extent does your company benefit from using these systems?

Benefits	Little Extent	Some Extent	Great Extent	Very Great Extent
	1	2	3	4
Better quality of information				
Better quantity of information				
Flexibility				
Reduced lead-time in production				
Cost saving				
Forecasting				
Resource planning				
Better operational efficiency				
Reduced inventory level				
More accurate costing				
Increased coordination between departments				
Increased coordination with customers				
Increased sales				
Better quality of information				
Flexibility				

8. Please indicate by ticking (√) the extent to which the following challenges affect your organization.

Statement	Little Extent	Some Extent	Great Extent	Very Great Extent
	1	2	3	4
Working Capital				
Infrastructure – Electricity, Poor Roads				
Government policies				
Natural Disasters – Floods, Drought				
Foreign Exchange Currency fluctuations				
Fuel Prices				
Euro Zone crisis				
International Standards – Fair trade, MPS				

APPENDIX II: KENYA FLOWER COUNCIL MEMBERS

The list below shows the registered members of the Kenya Flower Council who export flowers to Holland as per http://www.kenyaflowercouncil.org/index.php/joomlaorg/kfc-membership on line document accessed on 27th August 2013.

	Company	**Contact Person**	**Physical Address**
1	Aquila Dev. Co. Ltd	Mr. Jayaraj Govindarajan	P. O. Box 357 Naivasha
2	Bawan Roses Ltd	Betty Ann Mboche	P. O. Box 235 Thika
3	Beverly Flowers Ltd	Mr. M. Kabuyah	P. O. Box 53836 Nairobi
4	Bondet Limited	Mr. Andrew Fernandes	P.O Box 1076 Nanyuki
5	Charm Flowers Ltd	Mr. Ashokkumar Patel	P. O. Box 42417 Nairobi
6	Countrywide Connections Ltd	Mr. Richard Fernandes	P.O Box 1076, Nanyuki -10400
7	Elbur Flora Ltd	Mr. Peter Kairu	P. O. Box 54 Elburgon
8	Enkasiti Flowers Ltd	Mr. Biju Varghese	P. O. Box 50315 Nairobi
9	Finlay Flowers Ltd	Mr. Chris Mclean	P. O. Box 1966 Kericho
10	Florema (K) Ltd	Peter Maina	P. O. Box 124 - 20117 Naivasha
11	Four Ten Investments Ltd	Mr. Homer Combos	P. O. Box 42480 - 00100 Nairobi
12	Hamer (K) Ltd	Mr. Peter Bresser	P. O. Box 1896 Naivasha
13	Hamwe Ltd	Mr. Richard Fernandes	P.O. Box 791-20117 Naivasha
14	Homegrown Ltd	Mr. Rod Evans	P. O. Box 10222 - 00400
15	Isinya Flowers	Mr. Rajesh P. Dave	P. O. Box 18436 - 00500 Nairobi
16	Kariki Ltd	Mr. Richard Fernandes	P.O Box 6038-00100 Thika
17	Kenya Highlands Nurseries	Mr. Nathani Susan	P. O. Box 3474 Nakuru
18	Kreative Roses	Mr. Bas Smit	P. O. Box 868-00502 Nairobi
19	Kisima Ltd	Mr. Ivan Freeman	P. O. Box Private Bag, Nanyuki
20	Kudenga Limited	Mr. Richard Fernandes	P. O. Box 955 -20106 Molo
21	Lobelia Farms Limited	J. P. Viljoen	P. O. Box 227 TIMAU-60203
22	Longonot Horticulture Ltd	Mr. Umang Patel	P. O. Box 1271 Naivasha
23	Liki River Farm	Mr. Umang Patel	P. O. Box 32931 Nairobi

24	Magana Flowers	Santosh Gholkar	P. O. Box 14618 Nairobi
25	Matasia Valley Roses	Mr. Kephar Lenein Tende	P.O Box 62677-00200 Nairobi
26	Mosi Ltd	Mr. Morris Wahome	P. O. Box 39399-00623 Nairobi
27	Mt. Elgon Flowers Ltd	Mr. Bob Anderson	P. O. Box 124 Kitale
28	Mweiga Growers Limited	Mr. David Wachira	P.O Box 1017 Nyeri
29	Nini Ltd Mr. Mike Higgins	Mr. Mike Higgins	P. O. Box 569 Naivasha
30	Ol-Njorowa Ltd	Mr. Paris Issaias	P. O. Box 18156 - 00500 Nairobi
31	Oserian Dev. Co. Ltd	Mr. Ron Fasol	P. O. Box 43340, Nairobi
32	PJ Dave Flower Ltd	Mr. P. J. Dave	P. O. Box 18436 Nairobi
33	Pollen Limited	Mr. Iain Morrell	P. O. Box 1037 Ruiru
34	Primarosa Flowers Ltd	Mr. Naren Patel	P. O. Box 540 Athi River
35	Redlands Roses	Mrs. I. Spindler	P. O. Box 10 Ruiru
36	Sande (K) Ltd	Mrs. Colete Groenewegen	P. O. Box 709 Village Market
37	Shalimar Flowers (K) Ltd	Dennis Wedd	P. O. Box 781 Naivasha
38	Sian Roses	Ms. E Kimani	P. O. Box 15139-00509 Nairobi
39	Simbi Roses	Mrs. Nyachae / Mr Karue	P. O. Box 769 Thika
40	Subati Ltd	Mr. Homer Combos	P. O. Box 42480-00100 Nairobi
41	Suera Flowers Ltd	Mr. E Mureithi	P. O. Box 62599 Nairobi
42	The Plant Factory (K) Ltd	Mr. Peter Maina	P. O. Box 1739 Naivasha
43	Terra Fleur Ltd	Mr. Tiku Shah	P. O. Box 1092 Thika
44	Terrasol Ltd	Mr. S. Nannes	P. O. Box 63276 Nairobi
45	Tambuzi Ltd	Mrs. Maggie Hobbs	P. O. Box 1148 Nanyuki
46	Valentine Growers Co. Ltd	Mr. Eliud Njenga	P. O. Box 18755 Nairobi
47	Waridi Ltd	Mr. Jeremy Mott	P. O. Box 19294 Nairobi
48	Wildfire Ltd	Ct. Peter Szapary	P. O. Box 379 Naivasha
49	Windsor Flowers	Mr. D.F Shah	P. O. Box 746 Thika
50	Wilmar Agro Limited	Mr. Kamami	P.O. Box 1682, Thika

Source: Kenya Flower Council (2013)

APPENDIX III: FLOWER HANDLING FREIGHT COMPANIES

The list below shows the flower handling freight companies licensed by Kenya Revenue Authority as per http://www.revenue.go.ke/customs.pdf on line document accessed on 27th August 2013.

	Name	Contact Person	Address
1	Total Touch	Mr. Karel Swings	P.O Box 19295 - 00501
2	Flower Wings	Mr. Peter Schrama	Specialised Freight Rd, 1st Avenue, Nairobi
3	Air Connection	Mrs Jessie Ladha	P. O. Box 39700 Nairobi
4	Kuehne + Nagel International	Mr. Myles Hechle	Specialised Freight Rd, 1st Avenue, Nairobi

Source: Kenya Revenue Authority (2013)

APPENDIX IV: FLORAHOLLAND KENYA OFFICE

The table below shows the Floraholland Kenya office representing the flower co-operative based in Holland as per http://www.floraholland.com/ website accessed on 27th August 2013.

	Name	Contact Person	Address
1	Floraholland Kenya Office	GJ van der Kooij	P.O Box 19279-00501

Source: Floraholland (2013)