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Economic sustainability in the floriculture value chain in Kenya.

Njogu, George M.
Strathmore Business School
Strathmore University

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GEORGE M. NJOGU

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GEORGE M. NJOGU

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DECLARATION

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other university. To the best of my knowledge and belief, the report contains no material previously published or written by another person except where due reference is made in the thesis itself.

Name of Candidate: George Muchichu Njogu

Approval

The desertation of George M. Njogu was reviewed and approved by the following.

Name of the supervisor: Dr. Dennis Otieno

Strathmore University Business School

Dr. Angela Ndunge

Ag. Executive Dean

Strathmore University Business School.

Dr. Bernard Shibwabo

Director, Office of Graduate Studies

ABSTRACT

This study analyzed the value addition process in floricultural value chain among small scale, medium and large scale producers in Central Kenya. The analysis took an evaluative process and assessed the conversion of inputs to outputs by employing resources that add value during the production process. Value chain in agribusiness is a continuum which starts from the point of production where inputs are sourced and used by actors to facilitate basic agricultural production, activities and successive input from other stakeholders such that in each process step, value is added until the product reaches the end consumer. The objective of this study was to conduct an in-depth analysis of floriculture value chains and their economic sustainability in Kenya. The research used a mixed method approach using quantitative and qualitative data. A sample of 103 small scale, medium scale and large-scale firms was drawn from a population of 179 Kenya Flower Council members. A questionnaire was used to collect general firm data, production data, supply chain strategies and challenges along the floriculture value chains. Data was tabulated, classified, cleaned then analyzed using tables, charts, graphs and other statistical tools. The results showed that supply chain strategies had variable effects on economic performance. The study established that firms that used direct/mass market made higher returns than those that used auctioneers and therefore better positioned towards achieving economic sustainability. There was a strong correlation between marginal cost and economic performance. Despite the significant correlation between the two variables, marginal cost alone was not a good predictor of performance and economic sustainability of floriculture firms in Kenya. However, the utilization of economies of scale in horizontal integration yielded lower marginal costs. In particular, the utilization of performance management as a tool was statistically significant in enhancing marginal cost effect for improved economic performance of floriculture industry in Kenya. The study identified freight cost of floricultural products as the major value chain constrain that had significant effect on performance of floriculture industry economic sustainability. The researcher suggested a need for firms to utilize the opportunity in mass/direct markets, mainstream performance management tool, jointly lobby and seek alternatives to airfreight in order to cement a trajectory for economically sustainable floriculture value chains.

Key words: *Value chain, agribusiness, Floriculture, Economics, Sustainability*

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VT OMNES
VNVM SINT

ABBREVIATION AND ACRONYM

HFA- Holland Flower Alliance, An association of florists, whole sellers and auctioneers in Holland.

KFC- Kenya Flower Council. A lobby body for floriculture industry in Kenya

HCD- Horticulture Crops Directorate, Government Corporation dealing with licensing and compliance of Horticulture entities.

RFH- Royal Floral Holland Cooperative of growers and dealers with in the flower industry. Based in Holland and have branches all over the world. Owns the Auctions in the Netherland

EU- European Union

KEPHIS- Kenya Plant Health and Inspection organization, a government parastatal in Kenya dealing with regulation of plants and inspections.

FPEAK- Fresh produce exporters association of Kenya

KRA- Kenya Revenue Authority

KPA- Kenya Ports Authority

DEDICATION

I dedicate this work to my girls, Clara and Esther and son Brandon for their jokes and perseverance during my studies

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I acknowledge the almighty God for good health, my wife Pauline for her strength, my syndicate, colleagues for their critic and my supervisor Dr. Otieno for relentless support throughout my work in this project.

CHAPTER ONE: INTRODUCTION

1.0 Overview

The eminent theme of this study is an exploratory analysis of the floriculture value chain. This chapter captures the background information, states the research problem, outlines the purpose of study with objectives, research questions and details the significance of the study together with the scope and limitations thereof.

1.1 Background information

From independence, Kenya has depended on agriculture as the main driver of the economy. Agricultural sector has been the main contributor to the country's gross domestic product (GDP). The sectors contribution has stagnated over time ranging between 25% and 27 %. Dairy, tea and horticulture are the main subsectors that contribute the bulk of revenue in agriculture (Salvi & Pahurkar, 2020).

Horticulture is defined as the science and art of development, sustainable production, marketing, and use of high-value, intensively cultivated crops and ornamental plants. In the agriculture sector, horticulture continues to post positive growth of 13.6 % (Horticultural crops directorate, 2018). It has four disciplines namely olericulture, floriculture, landscaping and pomology. This study is limited to the floriculture sector that has been growing steadily over the last two decades.

Over the years, the flower industry has grown both in value and volume from 10,946 tons in 1988 to 86,480 metric tons in 2008 and 136,301 tons in 2014 and 159,961 tons in 2017 (Horticultural crops directorate, 2018). According to Horticulture crops directorate (HCD), the floriculture sector earned Kshs.82.248 billion (USD 823 million) in 2017,up from Kshs 70.829 billion in 2016, an increase of over 16% from year 2016 (Kenya Flower Council, 2018).The floriculture industry has contributed significantly to employment especially of the youth and women in the semi-arid areas where many flower farms are located .Further, more people are employed by the supporting and linkage industries such as transport and logistics, freight forwarding, input manufacture, distribution. Other people are employed by the mushrooming small-scale businesses around the horticulture centers which include provision of amenities and housing needed by the working populations (Kenya Flower Council, 2018).

Floriculture industry is a global value chain that involves many countries in the world who play

various roles from input distribution, seed manufacture, production and trading of cut flowers, potted plants and bending plants. Netherlands is the epicenter of flower trade and a gateway to the European market for flowers from around the world. There are 5 channels on which flowers are sold three of which go through the auction and thus auction is the main channel for the bulk of the flowers. Floriculture value chain has been identified as a key component for the country's achievement of Vision 2030 which aligns to millennium sustainability goals. Foreign direct investment in Floriculture have led to more farms being set up and creating jobs for the locals thereby contributing to millennium development goals of reducing poverty. Over 2million people are employed indirectly and 100,000 directly in the value chain. (Kenya Flower Council, 2018)

Value chain originates from the commodity approach and was coined in by Gereffi (1994) to investigate relationships between multi-national companies, the "lead firms", and other participants in international value chains. In this theoretical stream power relationships and information asymmetry are key concepts in the analysis of global value chains. Later works by Gereffi and others brought in the issue of upgrading value chains in developing countries. Gereffi (1999), Gereffi et al. (2005); Kaplinsky (2000). Looking at global commodity chains through the GVC lenses leads to the conclusion that inserting small developing countries into global markets through commodity exports is not sufficient to sustain real income growth, and may even prove detrimental to their long-term development prospects. Only by virtue of upgrading export industries – which entails moving towards differentiated products with a higher content of technology, skills and innovation – will developing countries be in a position to seize the opportunities brought about by globalization. (Farfan, 2005)

Exports of fresh cut flowers have experienced remarkable growth. Green bean exports also grew moderately. Traditional African export crops such as tea and coffee have grown moderately. The growth of avocado had stagnated during the period (Hortiwise, 2012)

A wide range of cut flowers are grown in Kenya and they include gypsophilla, alstromelia, erygiums, hypericum, statice, lilies and roses (Horticultural crops directorate, 2018). Kenya is the third largest producer and exporter of flowers in the word after Netherlands and Ecuador. It is closely followed by Ethiopia, Tanzania, Uganda, Zimbabwe and Rwanda.

Flowers from Kenya are exported to various destinations in the world, the bulk being delivered to European Union, Australia, Japan, UK and Middle East. In total Kenya exports her flowers to 60 countries around the world (Kenya Flower Council, 2018). The floriculture industry has many

critical players along the value chain. There are also many processes which add value to the product to realize the final product. Identifying, each player and examining their contribution to value addition may provide a clear understanding of activities along the value chain. A value chain is a model used to describe all the processes in which actors and their actions procure raw materials in a business, convert them into finished product which are then distributed to end consumers (Porter, 1985).

Increasing revenues can be attributed to increasing area under production with new firms out of foreign direct investment as well as local investors (Mulangu, 2017). The existing firms are also expanding their production areas to improve their economies of scale. There is a growth in portfolio of the Kenyan cut-flowers with high end tea hybrid rose varieties from high altitude areas coming in to compete with Ecuadorian flowers (Kenya Flower Council, 2018).

A producer would choose one or more than one of the five channels of value chain. The choice of the VC that a business adopts mainly would depend on the marketing strategy in the short and long run for the firm as well as the varieties grown or traded. For example, sweetheart roses are traditionally meant for supermarkets (mass markets) and are grown mainly in low to medium altitude areas whereas the tea hybrids are traded by florists and grown mainly in high altitude areas. The value chain consists of chain enablers including inputs providers to the farms (chemicals, fertilizers and soil testing), logistic service providers e.g. (K+N, Q7, Panalpina), support activities providers in marketing and audits e.g., Royal flora Holland and Kenya flower council are also part of this chain at various levels. KEPHIS on the other hand offer regulatory role for the industry in the issuance of phytosanitary certificates and inspections at the exit ports.

The role of specialized wholesalers has changed significantly over the last decade. Functions carried out by today's wholesalers involve coordination, quality control, logistical services, facilitating the value chain (Hortiwise, 2012).

1.2 Research Problem

A study by Hortiwise (2012) indicates a possibility of saturated market as a result of increased supply. The linear growth in volumes and value reported in the floriculture industry in Kenya have not really made actors better off. Instead, there is a backdrop in declining profitability increasing production costs in labor, inputs, regulatory and compliance requirements to mass markets thus rendering some businesses unviable. Studies have indicated that all actors must work systematically as a whole through all supply chain links to yield consumer satisfaction in the end through a combination of innovative technologies and optimal management of the supply chain (Olga Karpun, 2020). In the recent past several firms have either closed down, relocated or have been sold out (Hortiwise, 2012). In view of these contradictions/gaps, this study was born with an aim to engage with the chain participants to help understand the circumstances. Value chain analysis would provide in-depth understanding of the value chain that is important in dealing with bottlenecks and inefficiencies to address cost effectiveness, quality requirements and sustainability in the industry. (Hortiwise, 2012).

The main problem facing floriculture industry are value chain inefficiencies and bottlenecks that denies actors the opportunity to create and capture significant value. It's is observed that many firms are closing down with bankruptcy, sold out or even continue on a struggling path in the recent years. This is against expectation given the great business opportunities in the world market outlook and Kenyan competitive position spurred by good climate, location around the equator with sunshine round the year, marketing and freight infrastructure and transport networks that would raise the level of expected profits. Opportunities can be in vertical or horizontal integration aimed at creating and capturing the real value that would translate into real financial wellbeing of the firms.

Earlier studies (Hortiwise, 2012; Githere, 2017) had done an analysis on the entire value created in each step with-in the value chain. The result was that, Kenyan firms captured a value of 25% in various steps of production, handling and airline transport. Overseas chain actors in handling, importer, Auction, whole seller and retailer enjoyed a value of 75% of the price (Hortiwise, 2012). Evidently the lion shares of the value went to overseas chain actors. This position could have changed negatively for the local farmers aggravated by the introduction of V.A.T (value added tax) on inputs in 2019, upward spiral of wages and stagnation of the overall price level of outputs (flowers) in world mass market (Olga Karpun, 2020). The study of floriculture value chain in

Kenya by Githere (2017) dealt with small scale and medium scale farms and left out large scale farms that comprise a huge volume of floriculture output from the country (Githere, 2017). This study hopes to address this gap on the category that informed analysis by Githere (2017) so that the outcomes can be more reliable and build up to possibility for generalization. The issue of VAT on inputs was introduced in 2019 and there is limited information on the effect of introduction of VAT on inputs and the ripple effect this would cause on the captured value for the three categories of informants in our population. There is a need to validate the value created and captured at all level. Therefore, this study aims to analyze the value of small, medium and large-scale actors within the chain in order to confirm the current value captured by each participant of the chain and provide an understanding of the current state as it is.

1.3 General objective of this study

The main objective of this study is to conduct an in-depth analysis of floriculture value chains and their economic sustainability in Kenya.

1.4 Specific Objectives

1. To compare the economic performance of floriculture industry across different value chain strategies
2. To investigate the association between marginal cost and economic performance of floriculture industry in Kenya.
3. To determine the effect of value chain constraints on economic performance of floriculture industry in Kenya.

1.5 Research questions

1. What are the characteristics of floriculture value chain used in Kenya and how do they affect economic performance?
2. How does the marginal cost relate with floriculture industry economic performance in Kenya?
3. How does value chain constraints affect economic performance of floriculture industry in Kenya?

To answer research question 2 and 3, the following null hypothesis were formulated

H_{01} Marginal costs has no significant effect on economic performance of floricultural value chains.

H_{02} Value chain constrains have no significant effect on economic performance of floricultural value chains.

1.6 Research scope

The scope of this research is to engage with horticultural firms that are members of Kenya Flower Council (KFC). The researcher target to engage the small, medium and large-scale floriculture growers as well as other actors who participate in floriculture value chains in the country. Cut flowers are the main floriculture product grown and exported from Kenya. The main flower growing areas are Nakuru, Nyandarua, Laikipia and Nairobi regions.

1.7 Justification

This research will be important to the value chain participants, the policy makers and other researchers. The value chain participants will have the privilege of accessing empirical data to facilitate decision making regarding upgrading and integration opportunities within the value chain. For example, actors will be able to decide which activities they can perform and which ones they need to outsource. The policy makers will find this report useful with empirical evidence that could be useful in deliberation of intervention strategies to enhance better trade and business environment for the value chain actors. For example, the implications of VAT on inputs on various segments of the floriculture industry.

The students and researchers will find the information useful in expanding their knowledge in floriculture value chains in the Kenyan context.

1.8 Definition of Terms

Floriculture- Is the branch of horticulture that deals with cultivation of cut flowers, bending plants and potted plants for ornamental purpose.

Value chain- describes interaction, firms and processes that are needed to deliver products to end users, and they all aim to identify opportunities for and constraints against increasing productivity.

Value chain actors- is used to mean companies that interact to supply goods and services

Sustainability - involves measures aimed at preventing depletion of natural or physical resources, so that they will remain available for the long term. Sustainability has three pillars: economic, environmental and social. These three pillars are informally referred to as people, planet and profits.

Economic sustainability- refers to organizations ability to manage its resources and responsibly generate profits in the long term. To be sustainable, a business must be profitable.

Social Sustainability-often referred to as corporate social responsibility (CSR) is a responsible practice voluntarily where social concerns of employees and local communities regarded as stakeholders are integrated with the organizational operations as well as in the shareholder interactions.

Environmental sustainability-focuses on conservation of biodiversity without foregoing economic and social progress. It involves saving energy, reducing waste, recycling and protecting flora and fauna.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter serves to explore the existing agribusiness literature with emphasis on the conceptual framework, theoretical framework, value chain analysis and firm performance. The review is however, not limited to firms in the agriculture sector alone. In the empirical review section, we look at various value chain studies done by researchers and academicians and value chain concept. The review is grounded on three main themes, Value chain concept, performance management and sustainability aspects of the industry

2.2 Theory of Value Chain

Makokha, Onono, Mukhwana, Atsiaya, and Wambugu, (2020) conducted a value chain analysis of the artificial insemination services in Kenya, through a case study of the Western Kenya Region. In their report, Makokha et al., (2020) defined value chain analysis (VCA) as a process where an organization identifies its key support activities that add value to its output products, then analyze the cost or different drivers associated that confer them with better cost or competitive advantage. A commodity value chain then would entail all the inbound activities and processes that a firm would pursue to transform various inputs to outputs. According to Kezerashvili, (2018), value chain in agribusiness setup seeks to identify a set of actors that facilitate basic agricultural production, activities and successive input from other stakeholders such that in each process/ step value is added till the product reaches the end consumers. Value chain activities can produce goods or services and can be contained in a single geographical region or spread over a wider area. Francis *et al*, 2008). The main actors could link vertically or could be a linkage of different independent business entities. A medium farm may buy off another smaller farm to consolidate and grow its size and variety portfolio in a horizontal linkage or link with its packaging supplier to enjoy lower packaging prices in vertical linkage. Porter (1985) classified entities and activities involved in conversion of inputs to outputs into four roles at primary level namely inbound logistics, operations, outbound logistics and sales and marketing. Inbound logistics include all the activities involved in receiving warehousing and distribution of raw materials and inputs for manufacturing. It involves the relationships with suppliers and all activities required in receiving, storage and usage of inputs. Inbound logistics activities include transportation, material handling, storage, issues and communication (Porter, 1997). Operation technology involves all activities involved in transforming inputs to outputs. It involves process, materials, machine tools material

handling, packaging, maintenance, and testing, building design and operation and information systems. Outbound logistics include the warehousing and distribution of finished goods and include activities of transporting, material handling, packaging, communication and information systems. Service step in the primary activities of value chain refers to support of customers after the goods and services are already sold to them. Service technologies include further testing, communications and information systems. (Porter M, 1997) These primary activities are supported by the infrastructure of the firm, the human resources management, technological development and procurement activities. Infrastructure of the firm refers to the organizational structure, control systems, company culture and company's social capital. Others are department of finance, accounting, planning, public affairs, government relations, quality assurance and general management. Human resource management consist of all activities involved in recruiting hiring training development, compensation and layoff of employees as needed (Almazan et al 2011)

Technologies support value creating activities, it consists of hardware, software, procedures and technical knowledge that are employed in firm's transformation of inputs to outputs (Almazan et al, 2011). Firms' profitability and financial sustainability depend on its ability to effectively perform these value chain activities in an efficient manner so that the total value created provides satisfaction to the end user and that the consumer is willing to pay more so that the firm generates profit sustainably in return (Kokemuller,2007).

2.3 Cost and Profit Structure along the Floriculture Value Chain

As highlighted by Chandravanshi, Chandrakar, Sinha, Sahu, & Sai, (2018), floriculture is dominated by primary activities, such as seeding, pest control, irrigation, climate control, and monitoring production conditions among others, which involve outbound and inbound logistics. Chandravanshi et al., (2018) presented a success story of major flowers in Raipur city with a deliberate focus on the value chain on flowers for marketing. According to Chandravanshi et al., (2018), organizations that compete via cost advantage always encourage performance of internal activities at the lowest price per unit or provide superior product. A firm that produces its output at minimal costs often would enjoy better profits than peers.

A cost advantage also can be pursued by reconfiguring the value chain. This involves pursuing structural changes in the value chain in the name of new products, selling or distribution of products in differentiated ways or new channels in distribution (Simister.P, 2011). Other adjustments to capture value in the form of performance management that leads to agility and

process centric arrangements with proactive response planning to market and other changing demands coupled with accountable teams that create and generate reliable data for decision making all lead to long term cost advantage due to resultant waste reduction. In our analysis, cost alone would not be the sole decision trigger, embedded performance management strategy and staff confidence in the process and reliability of data are critical aspects that would affect efficiency and therefore future costs. (Simister.P, 2011).

2.4 Sources of Inefficiency along the Value Chain

The Value chain of a firm (Firm's VC) is a part of a larger industry's Value chain (VC). A firm that carries out more activities compared to Industry's VC is considered to be more vertically integrated. Floriculture value chain concept depicts actors connected to one another along a chain performing various value adding activities in production, processing, packaging, delivery and shipment of commodities to customers. This linkage of activities in a vertical chain cannot function in isolation, it is interlinked with other support activities horizontally. Over and above, the floriculture industry in Kenya provides output in the form of cut flowers and ornamentals for consumption in other parts of the world, the European Union, United States of America, Japan, China. In this regard, the climate and social political activities in these consuming countries always affect the Kenya's value chain. Over-supply in one country will affect the prices and vise-versa. The more information the industry has from other supply bases the better the industry stands to plan its production and optimize value.

Laura Horvath in her work in supply chain management (2001) indicated that collaborations required individual participants to adopt simplified, standardized solutions based on common architectures and data models. Time to market is critical and important aspect in value chain innovation. An emphasis on cultural dimension of value chain analysis. Cambridge University defines inefficiency as an adjective that describes the opposite of working or operating quickly in an effective way. Where effective way involves working or operating in a way that gets the results without any waste. The inefficiencies in the floriculture chain may result from the industry operating environment otherwise known as the enablers, the industry participants /actors or from the firm itself. The operating environment in the floriculture value chains as induced by the government interventions in the form of taxation, policy formulation and import /export regulation directions by the participating government bodies e.g. Kenya plant health inspectorate (Kephis)

and horticultural crops directorate (HCD), Kenya revenue Authority (KRA) Kenya ports Authority (KPA). Lobby organizations e.g., KFC, Kenya Association of Manufacturers(KAM), Fresh producers Association (Fpeak) and Kenya bureau of standards (KeBS) work closely to manage the environment of the value chains. (KFC, 2018). Introduction of export license processing fee as a percentage of gross invoice value in 2021 by HCD is one of regulatory interventions that have acted as a disabler in the export environment, by taxing gross incomes which goes against the taxation policy and as such contested by growers via KFC, KAM lobby group.

2.5 Potential Interventions to Control Inefficiencies in the Value Chain

2.5.1 Industry specific upgrading options

The floriculture industry value chain upgrading from the definition by Gereffi (1999) is seen as a process of improving the ability of a firm or an economy to move to more profitable and/or technologically sophisticated capital and skill-intensive economic niches. Kaplisky (2000) gives four directions in which economic actors can upgrade: increasing the efficiency of internal operations, enhancing inter-firm linkages, introducing new products and changing the mix of activities conducted within the firm. Pietrobelli and Saliola (2008) who agreed and built their case from Kaplinsky (2000) define the following upgrading options: entering higher unit value market niches, entering new sectors, undertaking new productive functions and in all cases enlarging the technological capabilities of the firms. In many ways upgrading is seen as both internal where the firm improves internal processes, product, function and external where a multi-sectoral focus with more areas is considered and a network of interrelationship with other industries and players within the value chain.

Most approaches to upgrading found in literature took the form of upgrading product, upgrading process, upgrading function (vertical integration) that involves doing more functions of the value chain or inter-sectorial upgrading (Horizontal integration). Vertical integration is a strategy whereby a company owns or controls its suppliers, distributors, or retail locations to control its value or supply chain. Vertical integration is very beneficial to a company as it allows a good control process, cost reduction, and improved efficiencies. Conversely, Horizontal integration is the process of a company increasing production of goods or services at the same part of the supply chain. A majority of companies achieve horizontal integration through internal expansion, acquisition or merger. However, this type of integration can lead to monopoly if a firm captures the vast majority of the market for that product or service.

2.5.2 Firm Specific upgrading Options

A major upgrading option, as described by Stacey Barr, (2016) is through performance management. Performance management is defined as the process of analyzing information to determine the progress towards a desired outcome for a given organization. The current floriculture business environment in Kenya is rapidly changing. The claims of saturated market place as a result of exponential growth in supply and a slower un-matched growth in customer base in Europe over the last two decades is slowly becoming a reality. As such the environment where the floriculture in Kenya operates is that of an ever-increasing demand to deliver exceptional results with limited resources. To fulfil these demands, the need to measure performance is inevitable and a source of organizational competitive advantage.

Performance measurement of the current generations is characterized by a transformative focus on objective driven performance management. Objective driven performance management is the foundation of operational excellence and its process centric approach aligns the execution of key processes to strategic goals by measuring and improving what matters most to an organization. In her latest publication "Prove it", Stacey Barr (2016) points out that Performance measures are supposed to be the evidence that convinces us that we have achieved, or at least we are making progress in the right direction, towards our goals. Stacey Barr emphasis is on decentralization of strategy to create intimate understanding and ownership, agility and flexibility as innate tenets of current performance measurement. In her own revelations such a decentralization, self-service paradigm is integral to meeting the ever-changing demands of the business by removing restrictions and bottlenecks historically imposed by IT departments. The objective performance management would result to a balanced score card for the firm that ensures sustainability in the long-run by translating strategy to actions and therefore results and outcomes.

2.6 Sustainability and Value chain Analysis

To date most value chain analysis focus on economic sustainability and inadequate attention is paid to social and environmental consequences of firm behavior and reallocation of resources within and between firms in the chain. This risk producing recommendations that either ignore the competitive advantage offered from improving environmental management and social welfare, or have such detriments as to render proposals unsustainable when exposed to broader public scrutiny.

Value chain Analysis (VCA) can expose strategic and operational misalignments within chains and consequential misallocation of resources and thus opportunities for improvement which create value and economic sustainability. As depicted by Andrew Fearne, (2017) in the hand for value chain analysis describes the anchors of sustainability are in respect of Governance with regard to focus in collaborative supply chain where resources and information is shared and perceived as a source of leveraging on resilience, the value created is shared across by all stakeholders in the chain and there is more focus on consumer with regards to product quality and organizational agility to remain sustainable into the future. Bony et al., (2007) urged that the characteristics of value chain management are pursuit of a shared vision through aligned strategies, structures and processes that are based on trust, open communication, commitment to continuous improvement, understanding of what the customer value in the product and a clear focus on creating that value along the chain. This result to mutual benefits from the creation, realization and flow of value along the chain. Such alignments require a shared common strategy amongst the main stakeholders /partners and unified execution across key functions (Gottorna, 2006; Fearne et al 2008)

2.7 Empirical Literature review

A number of scholars have delved into the study of value chain in agribusiness. Schmitz and Humphrey (2010) studied how insertion into global value chain affected upgrading in the case of industrial clusters. They had the attention to the position relationship of developing country firms selling to large global firms. In their argument, clusters were inserted into global value chain in different ways that had effect of enabling or disenabling local upgrading efforts.

Wijnands (2005) in his study indicated the floriculture industry as one of the truly global value chains. The author's main objective was to examine the competitiveness and capabilities of the floriculture industry in terms of key exporters and importers. In the author's argument, The Netherlands is depicted as the marketing and financial service hub and developing countries like Kenya as the production center and focuses on cooperation between the hub and production centers through sharing of information, knowledge and expertise.

Trienekens (2011) in agricultural value chains in developing countries looked as 3 components of identifying value chain constrain for upgrading as market access, weak infrastructures, institutional voids and limiting resources.

In floriculture Martysnovska (2011) studied global floriculture value chains with a focus on Ukrainian industry. His study came up with the main actors and processes from production to consumption that shape the Ukrainian chain. He also looked at macro and micro analysis of the flower industry.

In Kenya Kagongo (2013) studied value chain disruptions in Kenya. The study pointed out significant among factors that disrupt the value chain were natural disasters, logistics, process design, labor unions and production function mechanics.

Work by Githere (2017) studied value chain analysis of small and medium firms. The researcher used descriptive research method and the research found out that value chain participants that were able to perform most tasks along the chain ended up being most profitable. The study recommended a review that would include large farms and other regions who participate in the floricultural value chain. Large scale firms are important actors in floriculture value chains in that they contribute the most towards the value chain in volume terms.

Analysis of these studies provided a gap in context and scope, there is limited information that compares small, medium and large-scale firms in the floriculture value chains. There is limited information in economic sustainability of the chain participants. These gaps informed this study.

2.7.1 Cost Advantage and Value Chain

The study reviewed research by Salvi, and Pahurkar, (2020), who assessed the relationship between value chain analysis and competitive advantage. Salvi, and Pahurkar, (2020) descried value chain analysis as a strategy tool used to analyze firm internal activities. In their argument, they observed that the aim is to identify those activities that provide the highest value. By doing this, the firm is able to prioritize its functions and budgetary fund allocation of its processes. This is done by looking into internal activities and analysis of the firm's competitive opportunities or threats. The firm that competes through a cost advantage will try to perform its activities more efficiently for better results to provide a leverage over competitors. Primary activities are tied to direct value addition in the production process however, this may not necessarily mean they are more important than other related support functions of information management, modern human resource management as these could be in most cases the source of the competitive advantage.

2.7.2 Differentiation and Value Chain

The literature highlighted a study by Corejova, Rostasova, Rovnanova, and Valica, (2019), which assessed the competitive differentiation in the digital environment and social networks. The reviewed study observed that differentiation is achieved from changing individual value chain activities to increase uniqueness in the output of the final product. Corejova et al., (2019) revealed that building a virtual value chain through which a company integrates information necessary for ensuring process in the value chain provide managers with an ability to see the flow of information in the value chain from the beginning to the end. The changing is usually done by reconfiguring the value chain, developing a new product or variety that is unique and have the customers willing to pay for it at a higher price (Kokemuller, 2007). A differentiation advantage can be created at any step of the chain from procurement to distribution. Organizational Policies and decisions, networks linkages, timing, location, learnings, scale and general organizational social capital all derive uniqueness that causes differentiation (Porter M., 1997). Differentiation can be costly and firms have to consider the value derived from such endeavor. Firms may create uniqueness of their products by forward integration, backward integration or innovate new ways and processes that are able to leverage against benchmarks.

2.7.3 Competitive advantage and Value chain

Analysis of value chains in the business world is not new. Often entrepreneurs would perform an analysis of an industry of interest in order to know where to position their business in the vale chain. One of the main interests of studying the value chain would therefore be to enable investors to position their businesses where they can create and capture the greatest value sustainably to generate long time value for their investments. The work of Jonathan et al (2009) brought out the popularity of value chain where they tied competitiveness to business strategy themes of core competencies, comparative and competitive advantage, outsourcing, horizontal and vertical integration and best practices. Firms individually or in clusters have seek the value chain approach to deal with the urge to remain competitive by utilizing value chain approaches to streamline processes that generate goods and services that the customers value as well as guide in product and process innovation. Triekens (2011) studied about technological advancement that permit high level of information sharing that have reinforced business realization of value chain efficiencies especially in collaborations with win-win linkages. The work on Kenya's floriculture industry competitiveness by Mulangu (2017) identified three measures of competitiveness of Kenyan

flower farms as, the exported stems per employee, the quantity exported per area and the number of workers per hectare. The study that included also measures of capabilities concluded that there was a positive relationship between the different measures of competitiveness and firms aggregate technological capabilities. Michael Porter depicted the competitiveness of firms in a diamond model that includes input /factor conditions, context for farm strategy and rivalry, demand conditions and related and support industries (Fig 2.1).

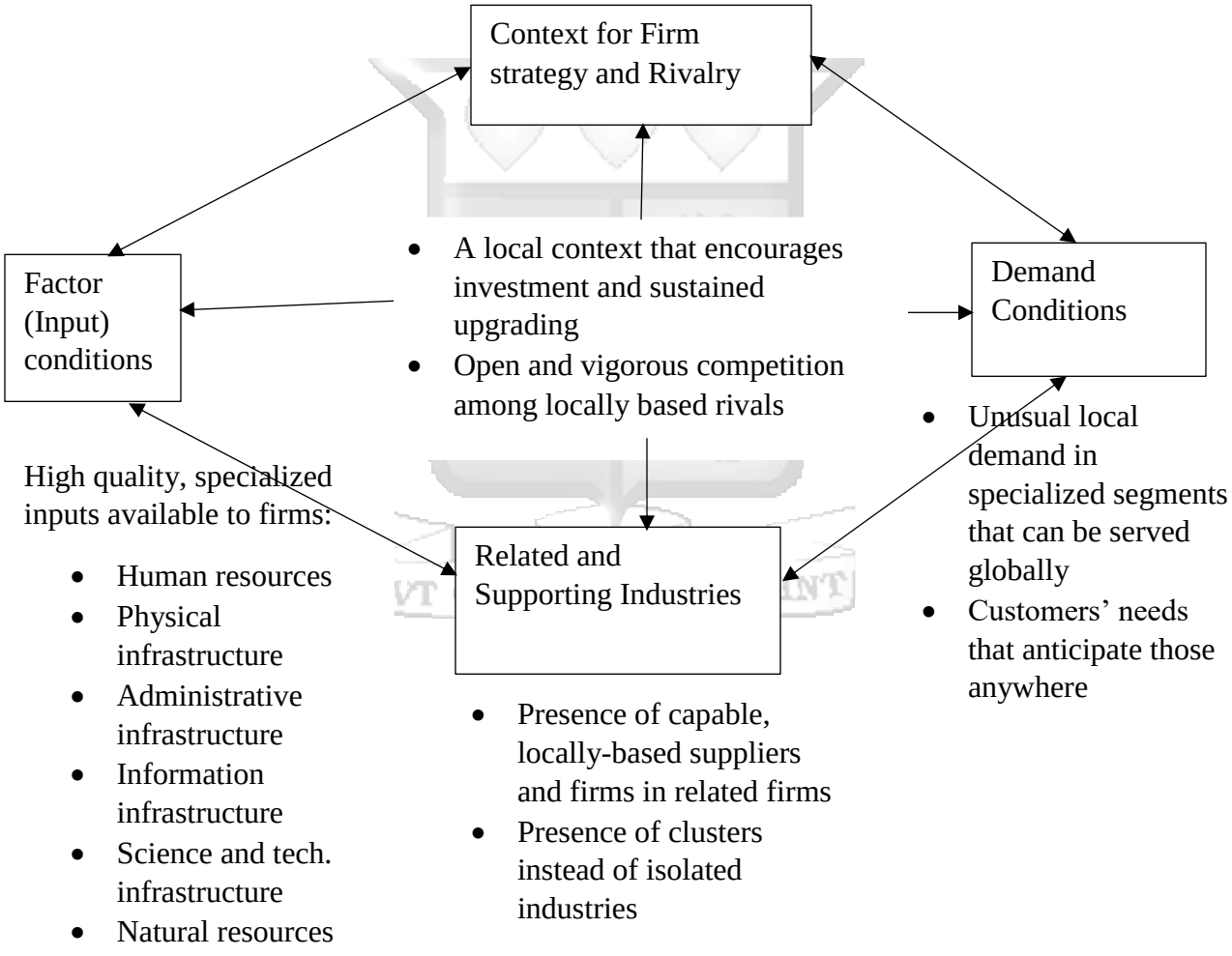

Fig 2.1 Competitiveness Diamond

Source: Michael Porter

The factor conditions include specialized inputs, human resources, capital resources, physical infrastructure, administrative infrastructure and natural resources. In Kenyan floriculture firms, these are in the form of altitude and latitude which ensures better quality and uniform growth from equatorial climate and availability of sunshine throughout the year. Available and relatively cheaper trained labor in Kenya also consolidates the competitive position of floriculture firms.

The ease of doing business, as measured in the global ease of doing business index, consolidates government involvement in trade and policy regulations that enables or dis-enables the business to thrive. The tax regime imposed on inputs e.g., VAT would affect the small and medium enterprises negatively. Large firms may get back the VAT spend from the government. This may take a while and affect the cash flow of the firms negatively, though profitability in the long run is not affected. Policies on labour regulations and labour laws that stipulate relations with the human resource, training and information infrastructure such as internet coverage and regulation allows better information flow and improves the competitive position.

A good business environment will enable firms to compete openly and encourage investment and sustained upgrading both in production and marketing. Demand conditions in the form of declining area under cultivation of flowers in the traditional west floriculture producing countries e.g., Netherlands and their growing consumer populations offer increased market opportunities for the Kenya floriculture industry. Lastly the strategic position of the horticultural firms with regards to alliances with local producers for a common marketing outlet that saves marketing costs, auction unpackers, RFH auctions and retail chains as well as big whole sellers in the consuming countries all add up the importance and sustainability of the floriculture industry in Kenya. Kenyan enterprises that collaborate and buy stake in the marketing and seed producing companies have an upper hand in developing a better grip in the industry and are better placed to develop sustainable businesses that overcome the liability of venturing into new markets and products with ease. This would enable the profit line to sustainably grow in the long run. Other that buy stake in input providing companies are able to get discounted value for the inputs. Others that collaborate into groups enjoy bulk buying of inputs from the manufacturers directly that provide for better overall inventory management and lower growing costs due to economies of scale and elimination of middle men / whole sellers and retailers from the supply chain.

2.7.4 Agricultural value chain

The study highlighted a research report by Park, & Gachukia, (2020) which assessed the impact of food value chain governance determinants on innovation competitiveness as evident from Kenya Horticultural exporters. In their study, Park, and Gachukia, (2020) viewed the value chain as composed of input and services providers, value chain actors such as producing farms, marketing firms, logistic providers e. g transport, freight forwarders lobby groups e. g KFC, Fpeak, Mount Kenya growers' group and chain enablers such as KEPHIS, HCD, KFC who offer regulatory and audit services to the actors. Agricultural value chain can be vertical linking or a network between various independent businesses and can involve production, processing, packaging, storage, transport warehousing and distribution. The main aim of a value chain is to produce value added products or services for a market, by transforming resources and utilization of infrastructures within the opportunities and constrains of its institutional environment. Agricultural value chain concept involves actors connected along a chain producing and delivering goods to consumers through a sequence of activities depicted in a "Vertical chain". This vertical chain of actors cannot however function in isolation. Value chain approach considers "horizontal chains "which impacts on the vertical actors. These include the services of input providers, finance provision, extension support services and general enabling environment (Ghemawat, 2002). This approach and consideration have been found useful by governments and donor organizations in that it has resulted in a wider range of considerations in analyzing agricultural value chains that would lead to a broader range of interventions for upgrading value chains and identifying market opportunities for small holder farmers (Pierre et al, 2013).

The floriculture value chain in Kenya is part of a global floriculture value chain with an epicenter in the Netherlands that can be depicted in this regard as a network of firms and intercompany relationships governed by Global value chain practices (GVC). The global value chain is embedded in a business environment that has enablers or dis-enablers. These include government policies, ease of doing business, power relationships, businesses networks in the industry, and the value contributed by each player and governance of the firms. (Trienekens, 2011). The description can be put in a simple diagram.

2.7.5 Challenges of Value chain Approach

Value chains have challenges relating to physical infrastructure in the form of road network quality and ability to be efficiently used in all seasons without supply chain disruptions. Seasonality in production and marketing with peak seasons render the installed cold-room capacity to operate under intense pressure in those peak periods due to high volumes (Hortiwise, 2012). The formation of value chain was initially part of manufacturing value chain and therefore in-depth thought have to be considered to make it workable in other areas such as floriculture. In Simister's words it is not a plug and play and therefore have to adopt the value chain principles to the floriculture chain to have meaningful value (Simister, 2011). This orientation is devoid of the considerations of the production and consumption that characterize the floriculture value chain in Kenya when the consumption of the floriculture is mainly away from the producing locations. The consuming countries drive the process and share information and culture of floriculture with the producing countries and therefore those producing countries that embrace and learn the industry faster are able to earn more value. This generally creates an information asymmetry in the market where the value chains near the customers in the consuming countries have more information than the value chain away from the customer in Africa such as Kenya. (Farfan, 2005).

2.8 Economic Sustainability

2.8.1 Overview of Economic Sustainability

Sustainability is defined as the ability to be sustained, supported, and upheld or confirmed (Diaz-Elsayed, Rezaei, Ndiaye, & Zhang, 2020). In the Oxford English dictionary, Sustainability is "The property of being environmentally sustainable; the degree to which a process or enterprise can be maintained or continued while avoiding the long-term depletion of natural resources " (Beaumont, 2019). Various disciplines define Sustainability differently. Environmentalists mean ecological Sustainability, while businesses may refer to Economic Sustainability. In policy contexts, Sustainability involves measures to prevent the depletion of natural or physical resources to remain available for the long term. Sustainability has 3 core concepts, often referred to as pillars, economic, environmental and social. These are informally christened as profits, people and the planet (Derksen, & Mithöfer, 2022).

Sustainability has gained popularity as a research area judging from the increasing numbers of research studies on Sustainability and the incorporation of its principles in the governance of organization operations and value chains around the world (Qorri et al., 2018). The nexus of

Sustainability is about responsible acts of human beings in mindful consideration of the environment, society, and future generations (Clark & Dickson, 2003; Clark, 2007). Sustainability is the ability to be sustained, supported, upheld, or confirmed. In the Oxford English dictionary, Sustainability is "The property of being environmentally sustainable; the degree to which a process or enterprise can be maintained or continued while avoiding the long-term depletion of natural resources". Various disciplines define Sustainability differently. Environmentalists mean ecological Sustainability, while businesses may refer to Economic Sustainability.

In policy contexts, Sustainability involves measures aimed at preventing the depletion of natural or physical resources from remaining available for the long term (Clark & Dickson, 2003). Sustainability has 3 core concepts, often referred to as pillars, economic, environmental, and social (Clark. 2007). These are informally christened as profits, people, and the planet. Social Sustainability, often referred to as corporate social responsibility (CSR), is a voluntary responsible practice where the social concerns of employees and local communities regarded as stakeholders are integrated with the organizational operations and the shareholder interactions (Tang 2018a,b).

Environmental Sustainability focuses on biodiversity conservation without preceding economic and social progress. It involves saving energy, reducing waste, recycling and protecting flora and fauna. Social Sustainability aims to strengthen the cohesion and stability of specific social groups within a community where economic activities are carried out (Wani, et al., 2018).

Economic Sustainability in macroeconomics focus on the need to maintain aggregate stocks of natural and manufactured capital constant over time so that future generations have consumption similar to those of the current generation. In the context of a firm, economic Sustainability refers to an organization's ability to manage its resources and responsibly generate profits in the long term. In a nutshell, to be sustainable, a business must be profitable. Economic Sustainability is, however, distinct from profits at all costs and involves activities like compliance, proper governance and risk management. These strategies promote Sustainability by utilization of social-economic resources to their best advantage. A sustainable economic model establishes an equitable distribution and efficient allocation of resources (Haasnoot, et al., 2022). Ensure that these allocated resources are utilized responsibly and efficiently, providing long-term benefits and thus profitable. A profitable business is more likely to remain stable in the short run and continue to

run from one year to the next. In this definition, economic Sustainability is linked to basic preoccupations of business managers of productivity, investment and profit.

All three pillars can be traced back to the economic aspect, which sustains and stabilizes the other two aspects, social and environmental Sustainability (Manca, 2015). Economic Sustainability, therefore, refers to the generation of income for the members of society without exploiting the capital and resources, which generates a circular effect and stabilizes the economy (Chelan et al., 2018; Spangenberg, 2005; Pires et al., 2017). To have this circular effect that stabilizes both economy and society, the organizations must transform their governance practices towards renewability, reusability, recycling, and life cycle costing, as well as integrate the cost of wastes, emissions, and pollution, among others in the costing system (Kibert, 2016; Zhong & Wu, 2015). Cairns and Martinet (2014) adopted sustainability accounting to assess the environmental-economic indicators and their role in sustainable growth and overall sustainable improvement. The dimensions of economic sustainability range from marketing strategy, market orientation, operational efficiency, and upgrading (Jia et al., 2018; Marchi et al., 2013) to value addition, performance management, ethical investments, resource conservation, and resource reuse, and resource recycling. All these activities can be broadly categorized under compliance, good governance, and business risk management. The economic pillar can sometimes be referred to as good corporate governance. Therefore, the boards of directors and management align with stockholders' interests and that of other stakeholders, value chains, and end consumers (Kocmanová et al., 2011; GRI, 2011). Most of the previous studies pointed out a part of economic sustainability indicators such as return on equity (Odiwo et al., 2016; Mateus & Belhaj, 2016; Rahman & Islam, 2018), return on asset (Jouha, 2015; Mateus & Belhaj, 2016; Adesanmi et al., 2018), Tobin's Q (Afrifa & Tauringana, 2015; Kyere & Ausloos, 2020) net profit margin (Chumo,2012 Azhar and Mehmood, 2018 Olayiwola, 2018) and investment in research and development (Njue ,2020). In this study the researcher combined investment in research and development (R&D), Performance management tool, availability of affordable financing and investment in fair trade accreditation as indicators of economic sustainability of firms. In the opinion of the researcher, these would yield a more robust measure than investment in R and D or net profit margin or ROE alone.

2.8.2 Economic Sustainability in floriculture Value chains

The sustainable floriculture value chain is considered when value chain actors or business firms can conserve natural resources, support healthy communities and workforce, and earn enough revenue to remain financially viable for the long term (Derksen, & Mithöfer, 2021). In floriculture value chains in Kenya, these preoccupations of business managers in productivity, investment and profit come in handy to differentiate firms depending on capabilities and upgrading options that a firm undertakes.

In this work, we considered profitability by looking at the revenues and actors' cost structure. The value chain actors whose revenues could cover their costs were considered profitable and could continue being in business from one year to the other (Wani, et al., 2018). We also looked at other indicators and business management practices that were considered economically sustaining. The practice of performance management Chumo, (2012), the share of the budget for research and development, corporate social responsibility Njue, (2020), and investments in fair trade certifications, among other practices, indicated the firm's sustainable trajectory. Those firms that engaged in the exercise were conspired to be more productive and therefore able to have an edge on capabilities for a sustainable trajectory.

2.9 Conceptual Framework

Independent variables **Dependent variables**

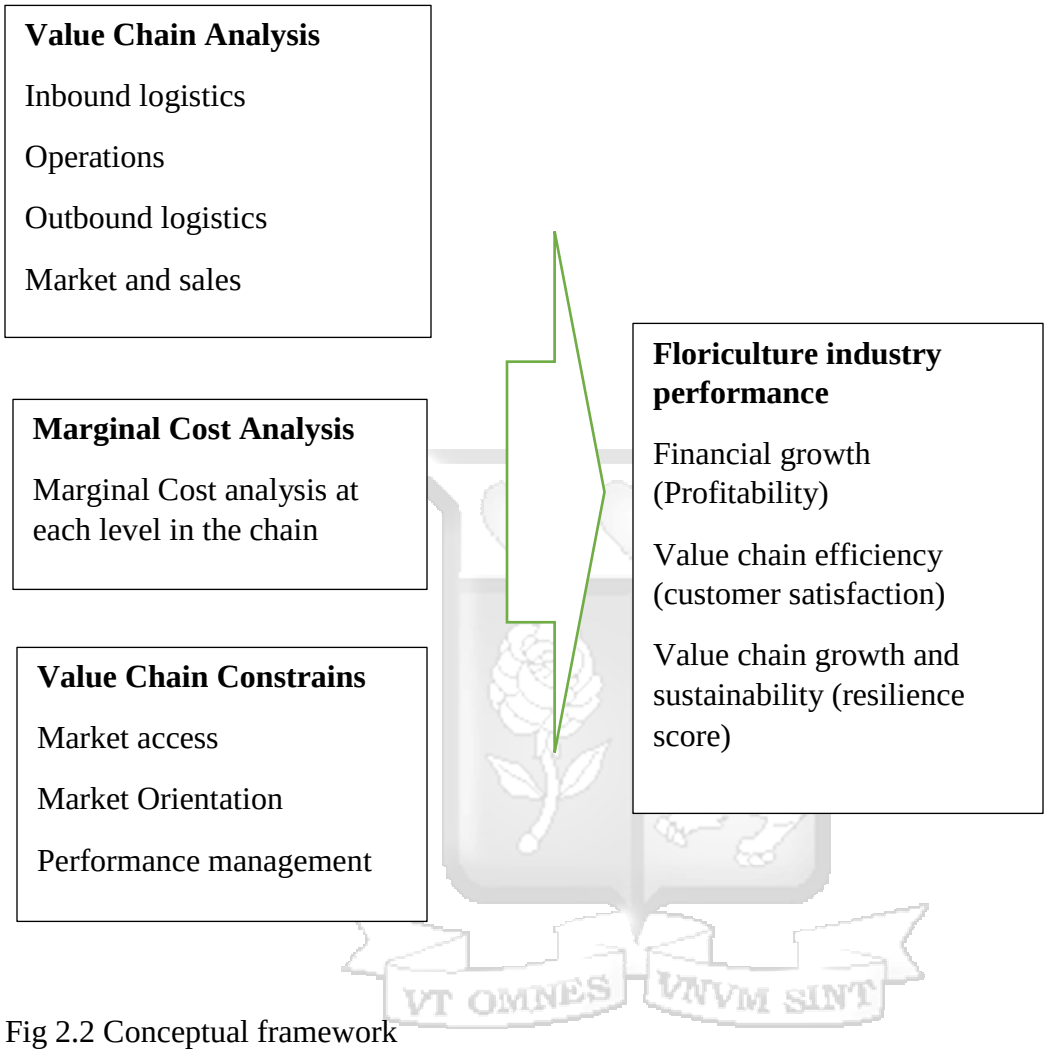

Fig 2.2 Conceptual framework

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter covers the framework of the research design that was used in the study. It describes the populations of interest and sampling method used as well as data collection tools used in the study to adequately answer the research questions.

3.2 Research Design

There are three research approaches that are used in Agricultural research. These are quantitative, qualitative and mixed research. In this work we used quantitative research, which utilized numerical data which were subjected to statistical models to yield results from which the conclusions were drawn. On the other hand, qualitative data that was gathered from the study by, observing their trends, and making critical judgments which led to study conclusions. In such a case, a mixed research method is said to have been adopted.

This study used a mixed method approach to collect quantitative and qualitative data that was used to evaluate the performance of the horticulture value chain in Kenya. The use of a mixed research method was employed as it yielded better research where the quantitative data helped in analysis and the qualitative data ensured the inferences made were detailed and supported. Hence, the study was able to conduct an in-depth investigation of the supply chain, profits and cost structure of small, medium and large-scale floriculture actors while utilizing a sufficient sample for a better generalization of the results to the entire population. The design enabled the researcher to give account of the floriculture industry as it is in practice, enable collection of current data from the population set so that the relationships existing in the current state can be interpreted for meaningful understanding.

3.3 Population

The population for the study is all horticultural firms that grow cut flowers, linkage industries in logistics and input supply and freight forwarders, participating government bodies and related associations. In the context these are grouped as either members, associate members or non-members of Kenya flower council (KFC). Further the cut flower farms were grouped into three categories based on area under plantation and activities carried out.

3.3 Sampling Frame and sample selection

The samples were drawn from all the supply chain links that take place within the country from

production to shipping of cut flowers. The sampling frame entailed the list of all firms registered with the Kenya's Horticultural Crops Directorate (HCD). HCD is a directorate under the Agriculture and Food Authority of the Horticultural crops sector, through the provisions of the AFA act (Act No. 13 of 2003), Crops Act (Act 16 of 2013) and other relevant laws and regulations. The study used a stratified sampling technique. The allocation of the sample sizes across the different strata was proportional to the strata sizes. The distribution of the sample was 51 and 50 from the KFC certified members and KFC associate members, respectively (Table 3.1).

Table 3.1 Sample stratification

Designation	Population	Stratification	Stratification	Sample	Procedure	Data Collection Type
KFC certified members/Producers	87	Cut flowers	Roses Summer flowers	63 8	Close ended	Questionnaire
		Cuttings/Breeders		6	Close ended	Questionnaire
KFC associate members	89	Consolidators		11	Close ended	Questionnaire
			Roses Out-grower farmers groups (10 farmers per group)	3 12	Open ended	Interviews, Questionnaire
TOTAL	176			103		

Roses are grown by individual grower companies within own farms or leased parcels. Summer flowers are grown by individual companies in their own farms and also using out-grower model with farmer groups of 10 farmers each with own piece of land pooled in the group for ease of management.

3.4 Data Collection

This study focused on use of primary and secondary data that was collected specifically for this research using structured questionnaires and interviews with practitioners. The questionnaires were prepared in advance with the assistance of subject matter specialists and researchers. The questionnaire consisted of four parts structured to essentially cover all the research objectives and avoid bias.

Part A consisted of general questions that covered the firm's unique characteristics viz. the farm size small/medium, member/associate member, location, ownership among other general information.

The second part, B focused on the value chain management practices adopted by the firm at each stage (Production, packaging, freight, airside transport, export price, quantity and quality) to ensure competitiveness, profitability and sustainability. The section collected data pertaining to Branding. It is important that these practices be defined in measurable terms. Like process innovation should was defined in terms of technology used in production inputs, breeders, growers their costs and views of practitioners while the third part C, concentrated on the marginal costs and profits along the value chain for the participants and actors.

Part D dealt with the value chain challenges /opportunities as experienced by the participant of the value chain and the performance management concept adopted by the firm and the resultant impacts on sustainability goals. The questionnaires were administered by the researcher together with trained assistant researchers, who in this case were trained by the researcher on how to do interviews so that the population can acquire a proper understanding of the questions and therefore derive a better touch and feel of the outcome. The respondents comprised of the firms' value chain departmental managers or their equivalents. The data variables were organized and classified under two broad categories, namely, the independent and dependent variables.

Independent variables

The first independent variable was the value chain strategy. The variable was measured using a categorical scale with two categories namely, strategy 1 and strategy 2 for those firms that used value chain 1-3 which dealt with auctions as their market, and those that used value chain 4-5, which dealt with direct/mass market.

The second independent variable was the marginal cost. Marginal cost was computed by diving the change in total cost by the change in quantity produced. That is;

$$marginal\ cost = \frac{change\ in\ total\ cost}{change\ in\ quantity\ produced}$$

The third independent variable was the market access. Market access represented one of the value chain constraints. The variable was measured using a categorical-nominal variable with two categories namely, auction and direct market.

The fourth independent variable was the performance management. The variable was measured using a Likert scale of 1-5, with the value 1 indicating poor performance management and 5 excellent performance management. Hence, the variable performance management was categorical-ordinal.

Dependent variables

The dependent variables included all variables that revealed that floriculture industry performance. In particular, the study focused on financial growth (profitability), which was measured using firm's profit. The profit was computed differently for firms that used different value chain strategies. Among firms that used strategy 1, auctions (value chain 1-3), the profit was computed using the formula;

$$profit = price\ per\ stem - cost\ per\ stem - freight\ cost\ per\ stem$$

That is, in additional to cost for producing the flower cuttings, the freight costs were also part of the firms' expenditure. On the contrary, the profit for firms that used strategy 2, direct/mass market (value chain 4-5) was computed by subtracting cost per stem only from the price per stem since the freight costs were incurred by the purchasers.

$$profit = price\ per\ stem - cost\ per\ stem$$

Beyond the profit, economic sustainability was assessed using a tool developed by employing other factors namely, Research and development (Njue, 2020) investment Corporate social responsibility investment, utilization of performance management tool (Chumo, 2020), availability of affordable financing (Njue, 2020) and investment in fair trade accreditation.

3.5 Data Analysis

The data that was collected was organized and analyzed using descriptive statistics to capture the general information about the sample i.e., using the means modes, frequency tables, mode and percentages to provide simple summaries on the samples. (Mugenda and Mugenda, 1999). The summaries were used to provide and explain the patterns and trends observed for profit and cost

buildup along the value chains. Various groups of producers, chain actors and enablers will be compared using graphical methods. In particular, the study used boxplots to describe the distribution of observed values across groups and also compare the groups. Qualitative information was used to explain the inefficiencies and strategies that can be used to improve the business environment along the floriculture value chain in Kenya to optimally use their business environment.

The first objective, to compare the performance of floriculture industry across different value chain strategies, was achieved using t-test technique. The choice for t-test was considered based on the number of groups to be compared. From the description of the data variables, value chain strategy had two categories, namely, strategy 1 and strategy 2. T-test is the best statistical analysis technique to compare two groups' means since it yields reliable results. The analysis entailed computing the student's t-test statistic using the formula;

$$t = \frac{\bar{x}_1 - \bar{x}_2}{s/\sqrt{n}}$$

Where;

T was the student's t-test statistic

$\bar{x}_1$ the mean of the firms that utilized strategy 1, the value chains 1-3

$\bar{x}_2$ the mean of the firms that utilized strategy 2, the value chains 4-5

S the sample standard deviation, and

n the sample size.

The second objective, to investigate the association between marginal cost and performance of floriculture industry in Kenya, was achieved by correlation analysis technique. The Pearson's correlation coefficient was computed using the formula;

$$r = \frac{\sum(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum(x_i - \bar{x})^2 \sum(y_i - \bar{y})^2}}$$

Where;

r= correlation coefficient

x_i= the values of the marginal cost (second x-variable in the sample)

y_i=the values of profit, the measure of the floriculture industry performance.

$\bar{x}$= the mean of the marginal costs

$\bar{y}$= the mean of the profits

The third objective, determine the effect of value chain constraints on performance of floriculture industry in Kenya, was achieved using a factorial design. The constraints were identified using a linear regression model. Those factors which produced negative coefficients were identified as potential sources of inefficiencies. Hence, the study utilized the model;

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \varepsilon$$

Where;

y= performance measurement

x_1= production

x_2= packaging

x_3= local transport

x_4= labor

x_5= freight

The beta's represented the model parameters while epsilon represented the error term.

CHAPTER FOUR: PRESENTATION OF RESEARCH FINDINGS

4.1 Introduction

In this chapter we present the results obtained from the information revealed by the gathered data. The chapter provides findings of the study in relation to the specific research questions. Hence, it is a critical section of the report as it links the research objectives to the conclusions of the study. In the first part we present the general findings in relation to the characteristics of the floriculture value chain. This is followed by the analysis of the cost and profit structure along the floriculture value chain. Thirdly, we present the findings related to the sources of inefficiencies as well as the strategies for improving the business environment along the floriculture value chain in Kenya.

4.2 The general Information

4.2.1 The characteristics of Floriculture value chain used in Kenya

The characteristics of the floriculture value chain used in Kenya were investigated across the four categories of farms, namely the breeder, enabler firms, small-scale farms, and medium and large-scale farms. The descriptive results are presented being the central tendency and dispersion of the observations across each category.

4.2.1.1 Breeder firms

All the farms under the breeder firm's category had roses as the type of cut flowers grown and traded. The analysis of the breeder firm's category revealed that the area, stems produced, leased area, and owned area averaged at 2.833, 1200000, 3 and 2.333 Ha, respectively. The standard deviation for the area and owned area were equal to 0.3073 and 0.5578, respectively. These values indicated that the breeder firms had varying leased areas as well as the owned area for their businesses.

`4.2.1.2 Enabler Firms

Similarly, all the farms under the enabler firm's category had roses and summer as the type of cut flowers traded. Analysis for the enabler category entailed instigation of the volume handled variable. The assessment of the central tendency showed that the mean tonnage for the enablers was 14.877. Conversely, the measures of dispersion showed that the tonnage within the enabler category varied greatly with a standard deviation of 4.915. The coefficient of skewedness was

positive (0.725) indicating that a majority of the firms handled greater than the average tonnage (Table 4.2.1).

Table 4.2.1: Descriptive statistics for the characteristics of n the Enabler firms' category

Tonnage Handled/Day	
Mean	14.87727
Standard Error	4.915483
Count	11
CV	30.959245

4.2.1.3 Medium and Large-scale Farm

This category had both roses and summer types of cut flowers that were grown and traded. Therefore, the researcher conducted group comparison for the two types of cut flowers to investigate the difference in characteristics the floriculture value chain within the farms between the roses and summer cut flowers. The variables of interest included the area, stems produced, leased, and owned area.

a) Area (ha)

The group statistics produced means and standard deviation values equal to 31.0455 (SD=15.58) and 20.25 (SD=9.8959) for the roses and summer flowers, respectively. The descriptive statistics revealed that roses were grown on more land area than summer flowers. Also, the statistics revealed that the farms with roses varied more, in terms of land area, than the farms with summer flowers.

The box plot, in agreement with the descriptive statistics results, revealed that roses were grown on larger area than summer flowers. Also, the plots revealed the area records for the two types of cut flowers were normally distributed. However, the farms with roses had several outliers on the upper extreme (Fig.4.2.1)

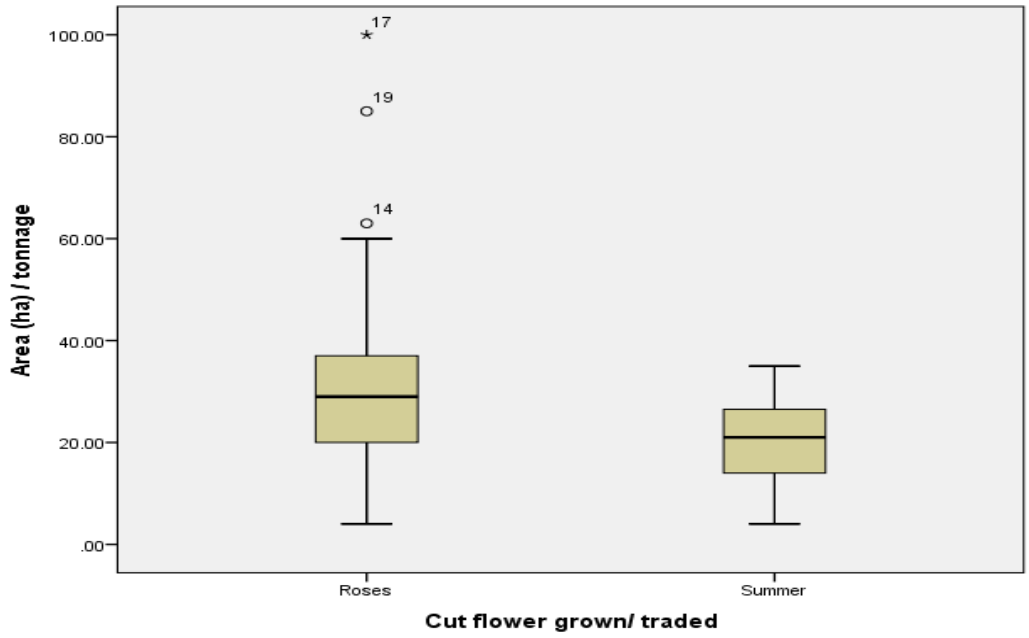

Fig 4.2.1: Comparison of area (ha) per tonnage between roses and summer flowers among the medium and large-scale farms.

b) Stems Produced

Similarly, group comparison was performed for the number of stems produced between the farms with roses and those with summer cut flowers. The group statistics produced means and standard deviation values equal to 1,468,712.1212 (SD=271,579.86586) and 1,132,082.5000 (SD=284,697.64943) for the roses and summer flowers, respectively. The descriptive statistics revealed that roses produced more than summer flowers. On the contrary, the statistics revealed that the farms with roses varied less, in terms of number of stems produced, than the firms with summer flowers.

Similarly, the box plot, in agreement with the descriptive statistics results, revealed that roses produced higher number of stems than summer flowers. The box plots revealed that the production of stems across the two types of cut flowers was skewed positively. Hence, a majority of the farms had production greater than the observed means for both roses and summer flowers. However, the farms with roses had several outliers on the upper extreme end (Fig.4.2.2).

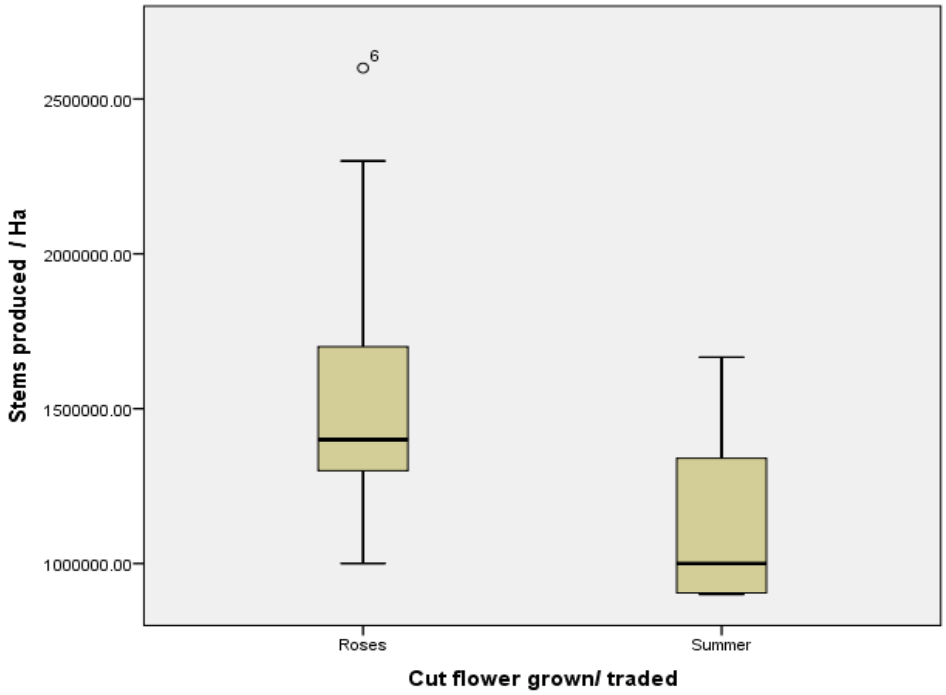

Fig 4.2.2: Comparison of stems produced between roses and summer flowers among the medium and large-scale farms

c) Leased and owned area

Separate group analysis was performed for the leased and owned areas across the two types of cut flowers grown and traded. The group statistics for the leased area produced means and standard deviation values equal to 9.0667 (SD=14.57722) and 0 (SD=0) for the roses and summer flowers, respectively. The descriptive statistics revealed that all the leased land was used for growing and trading roses. However, the group statistics for the owned area produced means and standard deviation values equal to 24.6667 (SD=19.71825) and 21.0000 (SD=1.41421) for the roses and summer flowers, respectively. The means showed that the roses were averagely grown on larger owned areas than summer flowers. Also, the results showed that the variation of the owned area was greater among farms growing roses than those growing summer flowers.

The box plot, revealed that the leased land for the medium and large-scale farms growing roses were skewed positively. Hence, a majority of the farms used leased land with an area greater than the observed mean (Fig 4.2.3).

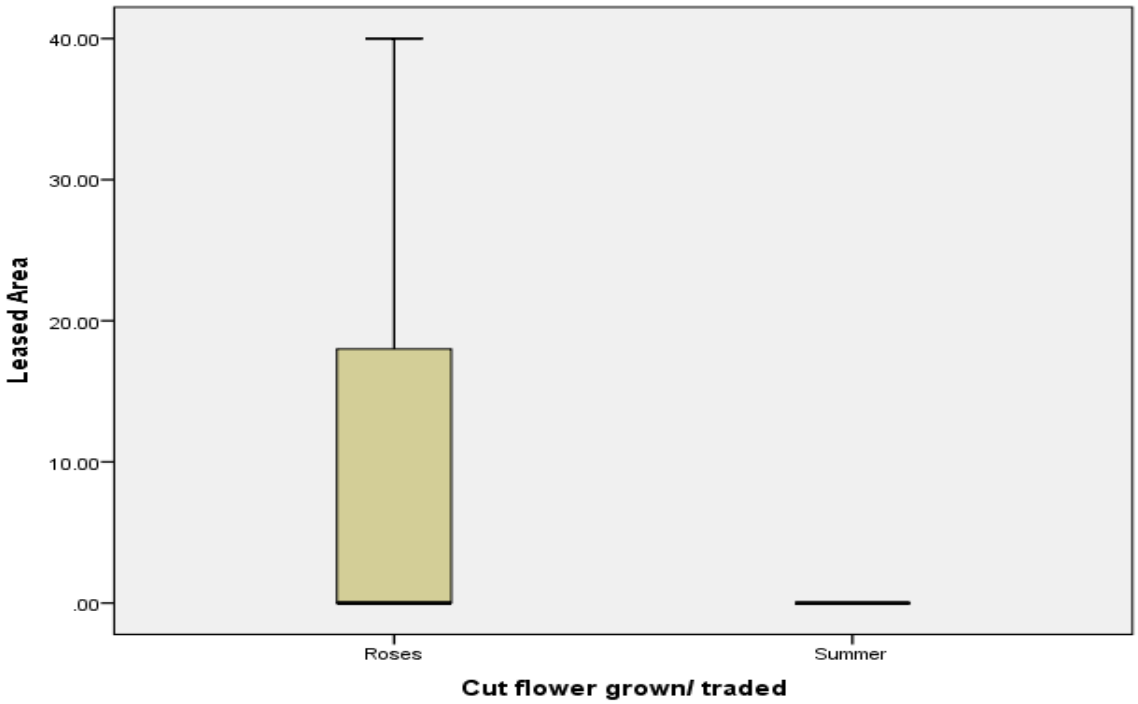

Fig 4.2.3: Comparison of the leased area between roses and summer flowers among the medium and large-scale farms

On the contrary, the box plot for the owned land area, revealed that roses were grown on larger area than summer flowers. Also, the plots revealed the area records for the two types of cut flowers were normally distributed (Fig.4.2.4).

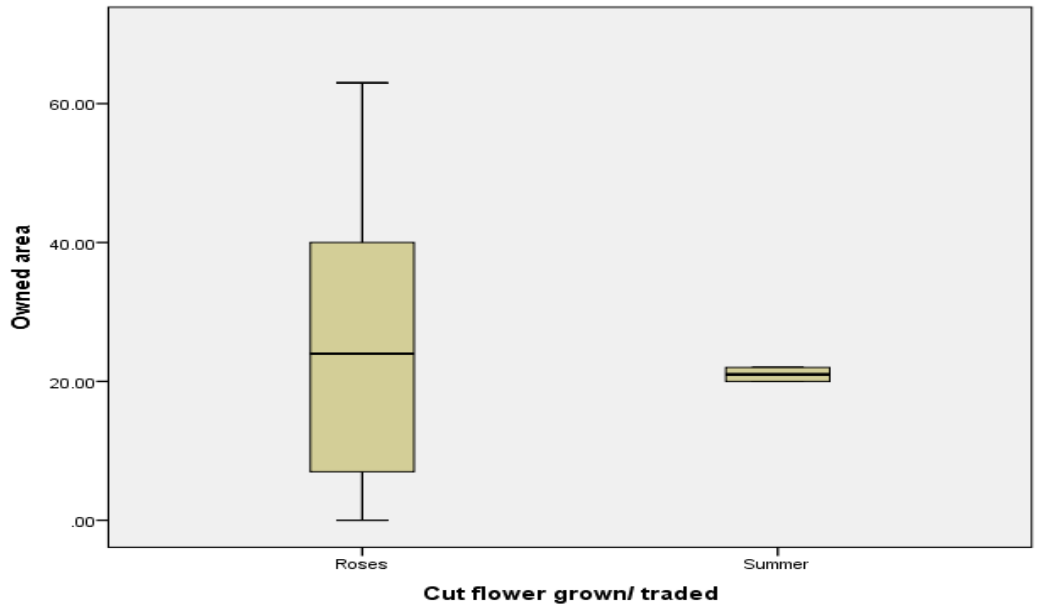

Fig 4.2.4: Comparison of the owned area between roses and summer flowers among the medium and large-scale farms

4.2.1.4 Small Scale Farms

All the small-scale farms had summer flowers as the type of cut flowers grown and traded. The analysis of this category revealed that the area, stems produced, leased area, and owned area averaged at 2.58, 930833.3, 1.35714, and 1.788333, respectively. The standard deviation for the area, stems produced, leased area, and owned area averaged at 3.100487, 196443.8, 1.134103, and 2.24403, respectively. The standard deviation values were large indicating that the small-scale farms had varying characteristics (Table4.2.2).

Table 4.2.2: Descriptive statistics for the floriculture value chain used in Kenya

	Statistics	Area	Stem produced/Ha	leased Land Area	Owned area
Breeder Firms	mean	2.833	1200000	3	2.3333
	Standard deviation	0.307	0	0	0.5578
	cv	0.108365	0	0	0.23906
Median and Large-scale Farms	mean	31.0455	1468712	9.0667	24.6667
i) Roses	Standard deviation	15.58	271580	14.5772	19.7183
	cv	0.50184	0.18491	1.60777	0.79937
ii) Summer	mean	20.25	1132083	21	
	Standard deviation	9.896	284698	1.41421	
	cv	0.48869	0.25148	0.00673	
Small scale Farms	mean	2.58	930833	1.35714	1.78833
	Standard deviation	0.89503	56708.4	0.42865	0.6478
	cv	0.34691	0.06092	0.315848	0.362237

4.2.2 The cost and Profit structures along the floriculture value chain

4.2.2.1 Analysis of the costs Build up

The cost of running the farms in the breeder's category was composed of several items/activities whose amount differed significantly. The total cost at exit point /airport cost was obtained by summing the production, packaging, local transport and labor costs. The greatest cost was costs were due to freight, production and labor with values equal to 0.09, 0.06, and 0.06, respectively. The total cost due to production, packaging, local transport, and labor provided the overall farm gate costs. The farm gate cost was 0.132 Euro.

Total Cost = Production Cost +packaging Cost+ Transp. Cost+ Freight .Cost

Farm Gate cost = Production Cost + packaging Cost

The cost of running the small-scale farms was composed of several items/activities whose amount differed significantly. The greatest cost was the freight cost, which averaged at 0.13 Euros per stem. Other significant costs included production, which averaged at 0.05005 Euros per stem. Also, the farms encountered costs related to packaging, local transport, and labor, which averaged at 0.006, 0.005, and 0.005 Euros, respectively. Jointly, the average farm gate cost was 0.06605 Euros.

The cost of growing roses among medium and large-scale farms was composed of several items/activities whose amount differed significantly. The greatest cost was the production cost, which averaged at 0.064 Euros per stem. Also, the farms encountered costs related to freight, packaging, local transport, and labor, which averaged at 0.043, 0.029, 0.013, and 0.014 Euros, respectively. Jointly, the average farm gate cost among the roses farms was 0.120 Euros.

Similarly, the cost of growing summer cut flowers among medium and large-scale farms was composed of several items/activities whose amount differed significantly. The greatest costs included freight and labor, which averaged at 0.092625 Euros, 0.05375 Euros, respectively. Also, the farms encountered costs related to production, packaging, and local transport, which averaged at 0.012391, 0.010163, and 0.008906 Euros per stem, respectively. Jointly, the average farm gate/airport cost among the roses farms was 0.124085 Euros.

The overall comparison of the costs along the floriculture value chain was done using a stacked columns bar graph. From the graph, the category having the least cost per stem including freight costs was medium and large-scale farms. Breeder firms incurred the highest costs. In all the categories, the freight costs were the highest (Fig.4.2.5)

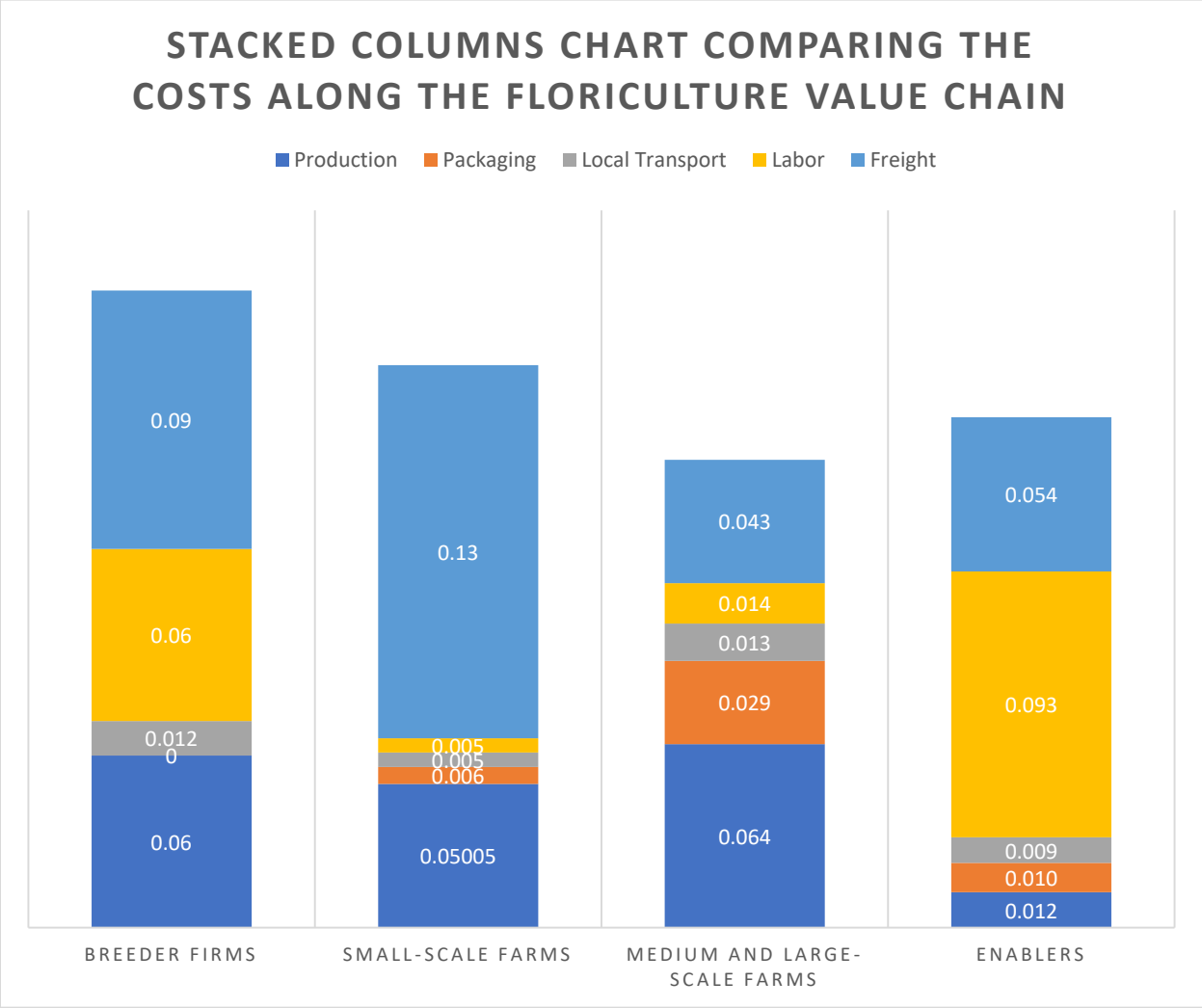

Fig 4.2.5: Stacked columns charts comparing the cost along the floriculture value chain

4.2.2.2 Returns for Roses and Summer cut flowers

The study used a standardized performance measure obtained by dividing the revenue by the costs as shown;

$$y_i = \frac{R_i}{C_i}$$

Where; y_i was the performance index for the ith farm. The values of R_i and C_i represented the revenue and cost for the ith farm, respectively. The study made a preliminary investigation of the performance index/measure, the model's dependent variable, to assess whether the data met the assumptions for the regression analysis. The descriptive statistics produced a mean performance measure of 1.4106 with a standard deviation of 0.555. The mean value was above 1, indicating that, on average, the selected farms made positive returns to their investments. However, the high value of standard deviation implied that the performance level varied greatly across farms (Table 4.2.3).

Table 4.2.3: Descriptive Statistics for the performance measure

	Minimum	Maximum	Mean	Std. Deviation	CV
Performance measurement	.18	4.05	1.4106	.55459	0.03931
Valid N (listwise)					

The frequency distribution analysis of performance/revenue revealed that a majority of the farms performed between 1 and 2. Hence, the analysis produced a frequency histogram with tall bars at the center and short bars at the ends, resulting in an almost bell-shaped curve. Hence, the study concluded that the performance index was normally distributed and the profit margins are positive. Hence, the data met the assumptions for a regression model (Fig4.2.6).

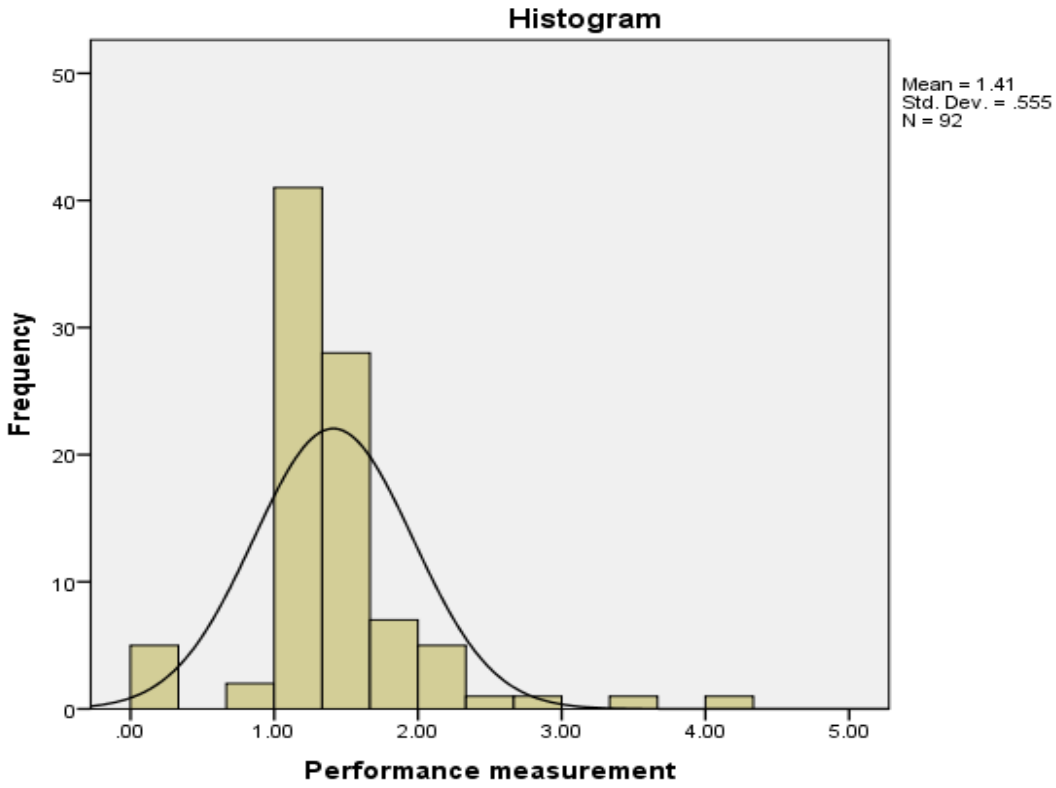

Fig 4.2.6: Frequency distribution of the performance

The analysis of returns across the farm categories revealed that the highest returns were among the small-scale farms with a mean of 1.8682 and a standard deviation of 1.0706. Other categories, including medium and large-scale farms, and breeder firms had means equal to 1.3535 (SD=0.4113), and 1.2004 (SD=0.0493), respectively (Table 4.2.4).

Table 4.2.4: Performance across farm categories

Report

Performance measurement

Farm Categories	Mean	N	Std. Deviation	Coefficient of variation (CV)
Small scale farms groups	1.8682	12	1.07063	0.57308
Medium and large-scale farms	1.3535	74	.41129	0.30387
Breeder	1.2004	6	.04929	0.04106
Total	1.4106	92	.55459	0.39315

4.3 Sources of Inefficiency/bottlenecks along the chain that negates financial sustainability in floriculture value chain

The study investigated the sources of inefficiencies/bottlenecks along the chain that negated financial sustainability in floriculture value chain using a multiple linear regression model. The regression model used the standard performance measure as the dependent variable. The model's independent variables included production, packaging, local transport, labor cost, and freight cost. In order to smoothen and improve the model, the study took logarithms for all the independent variables. The study assessed the model's goodness of fit using the ANOVA. The ANOVA produced a test statistic equal to F=17.051, p=0.00. The p-value was less than 0.05, the set level of significance. The study rejected the null hypothesis of unfitness and concluded that the model fit was good. Therefore, the marginal costs associated with production, packaging, labor, and freight were good predictors of performance (Table 4.3.1).

Table 4.3.1: Regression model's ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.379	5	1.076	17.051	.000[b]
	Residual	.883	14	.063		
	Total	6.262	19			

a. Dependent Variable: Performance measurement

b. Predictors: (Constant), Log Freight cost, Log Local transport, Log Labour cost, Log Production, Log Packaging

The analysis of the model coefficients obtained values equal to -1.220, -0.770, -0.032, 0.063, -0.078, and -1.541 for the log production, log packaging, log local transport, log labor cost, and log freight cost, respectively. Therefore, the equation representing the fitted regression model was of the form;

$$y = -1.220 - 0.770x_1 - 0.032x_2 + 0.063x_3 - 0.078x_4 - 1.541x_5$$

Where; y was the performance measure. x1, x2, x3, x4, and x5 were log production, log packaging, log local transport, log labor cost, and log freight cost, respectively (Table 4.3.2).

Table 4.3.2: Regression model's Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.220	.995		-1.226	.240
	Log Production	-.770	.898	-.115	-.857	.406
	Log Packaging	-.032	.311	-.015	-.102	.920
	Log Local transport	.063	.177	.047	.356	.727
	Log Labor cost	-.078	.303	-.032	-.256	.802
	Log Freight cost	-1.541	.204	-.864	-7.543	.000

a. Dependent Variable: Performance measurement

From the regression analysis the study revealed that production, packaging, labor cost, and freight cost had negative coefficients however these were better than -0.05 allowable level of error in the study except freight cost which was -0.864. Hence, the study concluded that freight costs was a major source of inefficiencies/bottlenecks along the chain that negated financial sustainability in floriculture value chain.

4.4 The effects of value chain constraints on performance of floriculture industry in Kenya

According to the study, the performance index was expected to decrease by 0.770 units for a unit change in log production, holding other factors constant. Also, the performance index was expected to decrease by 0.032 units for a unit change in log packaging, holding other factors constant. Besides, the performance index was expected to decrease by 0.078 units for a unit change in log labor, holding other factors constant. Furthermore, the performance index was expected to decrease by 1.541 units for a unit change in log freight, holding other factors constant.

Among the highlighted sources of inefficiencies/constraints in floriculture value chain, freight cost was the most significant. The t-test for the effect of freight cost produced a test statistic equal to t=-7.543, p=0.000. The p-value was less than 0.05, implying that the test rejected the null hypothesis concluding that the effect of freight cost on performance was statistically significant.

Other cost centers, which included production, packaging, and labor, produced t-test statistics equal to t=-0.857 (p=0.406), t=-0.102 (p=0.920), and t=-0.256 (p=0.802), respectively. The three value chain steps produced p-values greater than 0.05, the set level of significance. Hence, the study failed to reject the null hypotheses associated with production, packaging, and labor, and concluded that the effects of production, packaging, and labor on performance were not statistically significant and therefore not constraints.

4.5 The association between marginal cost and performance

The model summary produced R and R-squared values equal to 0.927 and 0.859, respectively. The value of R represented the coefficient of correlation between the marginal costs and performance. According to the study, there was a strong joint association between marginal cost and performance, with a correlation coefficient of 0.927. Conversely, the value of R-square presented

the coefficient of multiple determination. It implied that the marginal costs explained 85.9% of the variations on performance (Table 4.5.1).

Table 4.5.1: Regression Model's Summary statistics

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.927[a]	.859	.809	.25118

a. Predictors: (Constant), Log Freight cost, Log Local transport, Log Labor cost, Log Production, Log Packaging

Further, the study investigated the association between individual cost factors and performance using Pearson's correlation analysis technique. According to Akoglu, (2018), a positive Pearson's statistic implies a positive association while a negative one implies a negative association. Also, a statistic close to zero ($|r|<0.3$) implies a weak correlation, while a statistic close to either 1 or -1, ($|r|>0.7$) implies a strong correlation. The study obtained a test statistic equal to -0.712 with a p-value of $p<0.01$. The absolute value of the test statistic was greater than 0.7, revealing that there was a strong correlation between marginal cost and performance. Besides, the p-value was less than 0.05, implying the correlation between marginal cost and performance was statistically significant (Table 4.5.2).

Table 4.5.2: Correlations results

		Total cost/stem	Profit
Total cost/stem	Pearson Correlation	1	-.712
	Sig. (2-tailed)		.000
	N	92	92
Profit	Pearson Correlation	-.712	1
	Sig. (2-tailed)	.000	
	N	92	92

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

4.6 Investigating the effect of value chain strategy on Performance

The effect of value chain strategy on performance was investigated using One-Way ANOVA for mean comparison. The ANOVA technique was considered as the most appropriate because there more than two groups of data, which represented the five value chain strategies. The ANOVA produced a computed test statistic equal to F=9.463, p-value=0.00. The p-value was less than 0.05, implying that the test rejected the null hypothesis of no significance difference, concluding that at least one value chain strategy was significantly different (Table 4.6.1)

Table 4.6.1: One-Way ANOVA for the mean comparison across value chain strategies

ANOVA

Performance measurement

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	8.486	4	2.121	9.463	.000
Within Groups	19.504	87	.224		
Total	27.989	91			

From the descriptive report, value chain strategy 5 had the best performance with a mean performance measure of 1.6967 (SD=0.60623). The other significantly good value chain strategy, in terms of performance, was value chain strategy 4, with a mean performance measure of 1.6018 (SD=0.50963). Other value chain strategies, including strategy 1, strategy 2, and strategy3 had mean performance measurements of 0.7287 (SD=0.651), 1.2543 (SD=0.087), and 1.3268 (SD=0.28451), respectively (Table 4.6.2).

Table 4.6.2: Performance measure across value chain strategies

Performance measurement

Value chain strategies	Mean	N	Std. Deviation
Value chain strategy 1	.7287	10	.65100
Value chain strategy 2	1.2543	25	.08700
Value chain strategy 3	1.3268	12	.28451
Value chain strategy 4	1.6018	12	.50963
Value chain strategy 5	1.6967	33	.60623
Total	1.4106	92	.55459

A further classification was done to the value chain strategies where the first three strategies were found to rely more on auctions, while the other two (value chain strategies 4 and 5) relied more on direct/mass market. Hence, the study conducted an analysis to investigate whether the performance differed between these two categories of value chain strategies. Since there were two groups, the researcher employed a t-test analysis to compare the means.

The descriptive results revealed that the mean profit for the two value chain strategies were 0.0041 (SD=0.21313) and 0.1489 (SD=0.13281) Euros per stem for the value chains 1-3 (strategy 1, auctions) and value chains 4-5 (strategy 2, direct/mass market), respectively. The results indicated that firms that used direct market made higher profits than those that used auctioneers. The significance of the observed difference was tested using t-test (Table 4.6.3)

Table 4.6.3: Group Statistics

	Strategy	N	Mean	Std. Deviation	Std. Error Mean
Profit	Value Chain 1-3	48	.0041	.21313	.03076
	Value chain 4-5	44	.1489	.13281	.02002

The t-test analysis produced a computed t-statistic equal to -3.87 with a p-value of $p<0.01$. The p-value was less than 0.05, implying that the test rejected the null hypothesis and concluded that the performance of floriculture industry in Kenya different significantly between the value chain strategies (Table 4.6.4)

Table 4.6.4: Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Profit	Equal variances assumed	5.901	.017	-3.87	90	.000	-.1448	.0374	-.2191	-.0704
	Equal variances not assumed			-3.94	79.63	.000	-.1448	.0367	-.2178	-.0717

4.7 Strategies that can be used to improve the business environment along the floriculture value chain in Kenya to optimally use their business environment

This study considered a strategy as a synonym to masterplan, which was defined as a plan of action designed to achieve a long term or overall aim. Conversely, the term business environment connotes sum total of all external forces, internal factors and institutions that are beyond the control of the business and they affect the functioning of a business enterprise. These constitutes the customers, employees, competitors, government, suppliers, social, political, legal and technological factors. Michael porter in his work described these factors using competitive diamond.

One of the reasons Kenya floriculture industries have flourished in the last two decades lies in its geographical location, the equatorial climate around central Kenya where the equator passes enjoys sunshine and almost equal days and nights throughout the year with ample sunshine to support natural growth. Arable plains with fertile soils that support agriculture, Availability of fresh water lake in Nakuru county, lake Naivasha that supports numerous farms around it and abundant rain and underground waters in Laikipia and Nyandarua and Nairobi counties (Mulangu, 2017). Over the years the country's population have grown in number and skill set to match the requirements of floriculture intensive cultivation hence effectively emerging as and advanced competitive advantage of Kenya among African peers in floriculture. The researcher co-opted Value chain analysis (VCA) as a strategy tool to analyze firm internal activities by looking at each activity that a firm performs and optimally analyzing each step to identify activities that generate maximum value desired by the end consumer (Salvi and pahurkar 2020). The organization that identifies these steps and works towards optimally populating the value desired by the end consumer ends up being more competitive amongst the peers. There are various measures that have been applied to measure competitiveness in floriculture, Mulangu 2017 measured competitiveness of Kenyan floriculture industry using three measures, the exported stems per employee, the quantity exported per area and the number of workers per hectare. In this work, produced stems per area and number of workers per hectare have been used to rate competitiveness of firms.

The sampled farms were found to use several strategies in an attempt to improve their business environment along floriculture value chains. A common entry strategy highlighted by this study is the joint venture with a frequency of 12 (12%). This strategy allows the firms to take an investment position in a foreign location without taking on the complete responsibility for the foreign investment. Through joint ventures, farms have been able to effectively enter international markets through partners' complements.

Also, farms were found to embrace innovation with a frequency of 18 (18%). Innovation-related internationalization model was adopted to examine how the farms progressed in the process of internalization. The results revealed that the process was characterized by stages with stagnation periods. A further discussion with the respondents revealed that the stagnations were influenced by the degree of involvement in the global economy.

Further, the export strategies commonly adopted by the sampled farms included optimization of the product quality, organization of the supply chain and product diversity, with frequencies equal to 21 (20%), 18 (17%), and 9 (9%). The farms under medium and largescale category had, to a great extent, embraced diversification by growing both roses and summer cut flowers to almost equal magnitudes. Another common strategy adopted by the farms in Kenya was the export marketing strategy with a frequency of 22 (21%) (Fig.4.7.1).

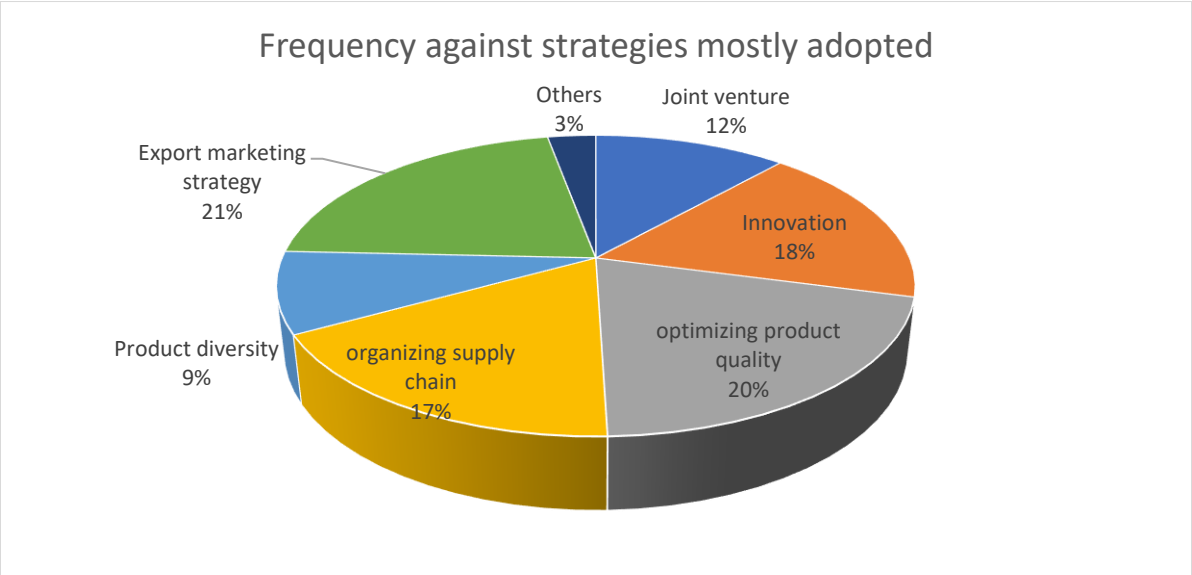

Fig 4.7.1: Frequency distribution against strategies most adopted

The effect of value chain constraints on performance of floriculture industry in Kenya was investigated using factorial ANOVA. The test statistics were equal to F (4, 82) =2.895 (p=0.027), F (1, 82) =3.800 (p=0.055), and F (4, 82) =1.658 (p=0.168), for the performance management, market access, and the interaction between performance management and market access, respectively. From the analysis, the p-value associated with the effect of performance measurement was less than 0.05, implying that the test rejected the null hypothesis that the main effect of performance management was insignificant. The study, hence, concluded that the main effect of performance management on performance of floriculture industry in Kenya was statistically significant. On the contrary, the p-values associated with the main effect of market access and the interaction effect between performance management and market access were greater than 0.05. Hence, the study concluded that both the main effect of market access and the

interaction effect between performance management and market access on performance of floriculture industry in Kenya, were not statistically significant (Table 4.7.1)

Table 4.7.1: Tests of Between-Subjects Effects

Dependent Variable: Profit

Source	Type III Sum of Squares	D f	Mean Square	F	Sig.
Corrected Model	1.126[a]	9	.125	4.563	.000
Intercept	.270	1	.270	9.847	.002
Performance management	.318	4	.079	2.895	.027
Market access	.104	1	.104	3.800	.055
Performance management* Market access	.182	4	.045	1.658	.168
Error	2.248	82	.027		
Total	3.869	92			
Corrected Total	3.375	91			

a. R Squared = .334 (Adjusted R Squared = .261)

Since the results for the effect of performance management on performance of floriculture industry in Kenya yielded significant results, it was paramount to conduct a post hoc analysis to determine which levels of performance management were significantly different. The study conducted an LSD test as the post hoc analysis. The pairwise comparison revealed that the lowest level, (level 1) was significantly different with other levels of performance management apart from level 2. Similarly, level two was significantly different with all other levels of performance management apart from level 1. Level 3 of performance management was significantly different with levels 1 and 2. Also, levels 4 and 5 of performance management were significantly different with levels 1 and 2 in below table (Table 4.7.2).

Table 4.7.2: Multiple Comparisons

Dependent Variable: Profit LSD

(I) Performance measurement	(J) Performance measurement	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					L Bound	U Bound
1.00	2.00	-.0598	.06047	.326	-.1800	.0605
	3.00	-.2011*	.05208	.000	-.3047	-.0975
	4.00	-.2362*	.05719	.000	-.3499	-.1224
	5.00	-.2505*	.06413	.000	-.3781	-.1229
2.00	1.00	.0598	.06047	.326	-.0605	.1800
	3.00	-.1414*	.05208	.008	-.2450	-.0378
	4.00	-.1764*	.05719	.003	-.2902	-.0626
	5.00	-.1908*	.06413	.004	-.3184	-.0632
3.00	1.00	.2011*	.05208	.000	.0975	.3047
	2.00	.1414*	.05208	.008	.0378	.2450
	4.00	-.0350	.04825	.470	-.1310	.0609
	5.00	-.0494	.05630	.383	-.1614	.0626
4.00	1.00	.2362*	.05719	.000	.1224	.3499
	2.00	.1764*	.05719	.003	.0626	.2902
	3.00	.0350	.04825	.470	-.0609	.1310
	5.00	-.0144	.06106	.815	-.1358	.1071
5.00	1.00	.2505*	.06413	.000	.1229	.3781
	2.00	.1908*	.06413	.004	.0632	.3184
	3.00	.0494	.05630	.383	-.0626	.1614
	4.00	.0144	.06106	.815	-.1071	.1358

Based on observed means.

The error term is Mean Square (Error) = .027.

*. The mean difference is significant at the 0.05 level.

The means plot showed that performance of floriculture firms in Kenya was greatly influenced by performance management if the firms utilized direct/mass market technique. This was evidenced

by the significant change in the graph of the direct/mass market across performance management levels (Fig.4.7.2).

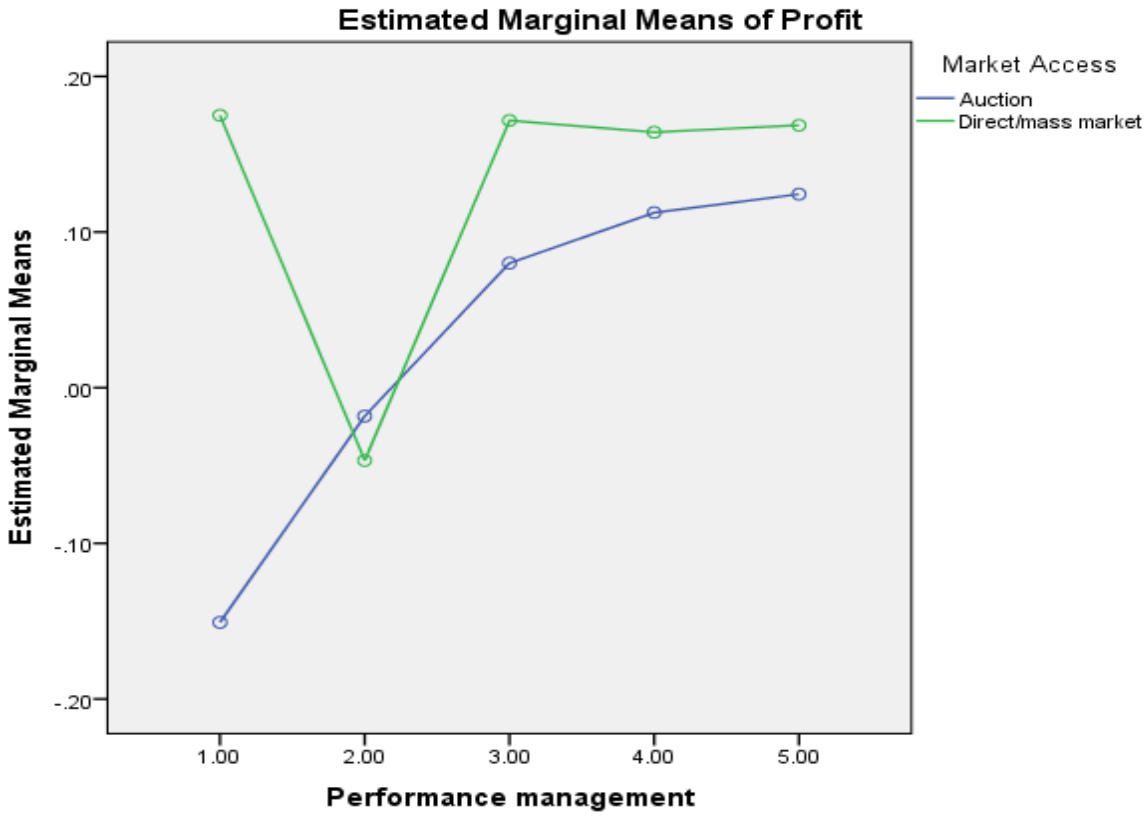

Fig 4.7.2: Mean plot for the effect of market access and performance management on floriculture industry performance

4.8 Economic Sustainability

The study used five measures of economic sustainability, namely percentage of CSR budget, performance management utilization, affordable financing, percentage of R&D budget, and fair trade certification status. The descriptive statistics for the percentage of CSR and R&D budgets revealed that on average, firms had percentages of 2.0684% (SD=2.672) and 6.5618% (SD=15.467), respectively. The results indicated that the majority of the sampled firms were keen to invest in corporate social responsibility, though only a small percentage of their budgets .There is a small chunk of the budget set aside for research and development except for breeding firms whose portion shows a huge disparity in investment on research and development. The

expectation is that more and more funds should be allocated to these two voter heads to improve economic sustainability of floriculture firms (Table 4.8.1).

Table 4.8.1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
% of CSR Budget	95	.00	10.00	2.0684	2.67237
% of R&D Budget	89	.00	70.00	6.5618	15.46694
Valid N (list wise)	89				

The frequency distribution of the performance management utilization revealed that a majority of the firms were using performance management utilization as a tool for management, with a frequency of 56 (53.3%). Another significant proportion of firms, with a frequency of 35 (33.3%) used performance management utilization, though they considered it not important (Table 4.8.2).

Table 4.8.2: Performance management utilization (1 utized-3 not important)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	1	1.0	1.1	1.1
	Yes	56	53.3	60.9	62.0
	Yes but not important	35	33.3	38.0	100.0
	Total	92	87.6	100.0	
Missing	System	13	12.4		
Total		105	100.0		

On the other hand, a majority of firms had fairly affordable financing, with highest frequencies being 71 (67.6%), 6 (5.7%), and 7 (6.7%), for the affordability levels 2, 3, and 4, respectively. Hence, in terms of affordable financing, firms were fairly economically sustainable (Table 4.8.3)

Table 4.8.3: Affordable financing(1-affordable,5 -not affordable)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	1	1.0	1.2	1.2
	2.00	71	67.6	82.6	83.7
	3.00	6	5.7	7.0	90.7
	4.00	7	6.7	8.1	98.8
	5.00	1	1.0	1.2	100.0
	Total	86	81.9	100.0	

Conversely, a majority of firms, with a frequency 45 (42.9%) never practiced fair trade. Only a small proportion, with a frequency of 14 (13.3%), that practiced fair trade. Hence, with regards to fair trade, the firms were not economically sustainable (Table 4.8.4)

Table 4.8.4: Fair Trade

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	45	42.9	76.3	76.3
	Yes	14	13.3	23.7	100.0
	Total	59	56.2	100.0	
Missing	System	46	43.8		
Total		105	100.0		

4.9 Summary of the Results

The analysis revealed that the farms differed in characteristics across different categories and across different types of cut flowers grown. All the breeder firms had roses as the type of cut flowers grown and traded. On the contrary, all the small-scale farms had summer flowers as the type of cut flowers grown and traded. However, medium and large-scale farms grew both roses and summer types of cut flowers that were grown and traded.

Also, the analysis showed that firms differed in terms of area of production, leased area and owned area. The medium and large-scale farms had the largest parcels of land, where both roses and summer flowers were grown followed by breeder category and lastly small-scale farms.

For the number of stems produced, the analysis results showed that the highest numbers of stems were produced by medium and large-scale farms that grew roses followed by the farms in the breeder category. The least number of stems was produced by medium and large-scale farms that grew summer flowers and finally the small scale farms produced the least per square area. However, the production from all the categories was statistically large.

Comparison of the leased versus the owned area among the breeder firms revealed that leased land was more popular than owned land. On the contrary, for the medium and large-scale farms that grew roses and summer cut flowers, owned area was more popular than leased land. Similarly, among the small-scale farms owned land was more popular than leased land.

With regards to the cost and profit structures, the analysis revealed that the greatest costs were freight costs across all the categories of firms sampled. Also, according to the analysis of the results the medium and large-scale farms incurred the least costs per unit stems and still produced the highest number of stems per unit area and majority sold their products to mass markets /supermarkets abroad (export sales). This category came out as the most competitive in input /factor utilization, had good physical infrastructure, sound human resource management and technological investments that enables flow of information from the clients and demand factors to the production units and thus more aligned to requirements of the market .On the other hand, the small-scale farms were making the least returns. They had meagre investments on physical infrastructure and were growing for the medium and largescale firms under out-grower contracts (local sales/out growers). Nonetheless, all the farms were making positive gains.

According to the study, the researcher observed inefficiencies in various value chain links of production, packaging, labor, and freight management. Among these sources of inefficiencies, freight was the most significant hindrance of returns. Also, the findings revealed that the most common production-related inefficiencies among the small-scale farms was the Factor /input conditions .The input utilization is not optimum for example in irrigation systems, minimum investment in talent, equipment and facilities. The inefficiency was more common among small scale farms that ended up producing less stems per square area per annum. The small-scale farms

relied on overhead irrigation and rain fed irrigation and some didn't have connection to power. The study revealed a strong joint association between marginal cost and performance. Also, the study showed that the marginal costs explained 85.9% of the variations on performance.

Further, the study revealed a significant effect of value chain strategies on performance. Value chain strategy 5 had the best performance with a mean performance measure of 1.6967 (SD=0.60623). The other significantly good value chain strategy, in terms of performance, was value chain strategy 4, with a mean performance measure of 1.6018 (SD=0.50963). Other value chain strategies, including strategy 1, strategy 2, and strategy3 had mean performance measurements of 0.7287 (SD=0.651), 1.2543 (SD=0.087), and 1.3268 (SD=0.28451), respectively. Generally, the value chain strategies 1, 2, and 3 (which relied on auctioneers) performed poorer than value chain strategies 4 and 5 (which relied on direct/mass market).

A common entry strategy highlighted by this study is the joint venture, which allows the firms to take an investment position in a foreign location without taking on the complete responsibility for the foreign investment. Through joint ventures, farms have been able to effectively enter international markets through partners' complements. Also, farms were found to embrace innovation. Strategies commonly adopted by the sampled farms included optimization of the product quality, organization of the supply chain and product diversity. Another common strategy adopted by the farms in Kenya was the export marketing strategy. The study revealed that affordable financing was available for majority (67.6%) of value chain participants' interviewed, another 86.6% utilized performance management in their management, out of which 53.3% had integrated performance management into their day to day activities. There is however a small percentage that embrace research and development and corporate social responsibility with an investment of 5.6% and 2.1% of their budgets respectively.

4.10 Summary of the Chapter

The chapter was able to yield results capable of answering the specific research questions. The chapter presented characteristics of the floriculture value chain where comparative analysis was performed across farm categories and types of cut flowers grown. Also, the chapter described the cost and profit structures of the sampled farms. The chapter presented results related to the inefficiency and bottlenecks along the chain that negates economic sustainability in floriculture value chain. The chapter presented findings about strategies that can be used to improve the

business environment along the floriculture value chain in Kenya for optimal performance. The next chapter is the discussions, conclusions and recommendation chapter. The chapter discusses the findings in relation to the existing literature and makes a summary of the findings which is presented as the conclusion. Based on the conclusions, the chapter presented recommendations that would minimize the intensity of the problem. The chapter was able to describe the effect of value chain strategies on performance as well as the association between marginal cost and economic performance. The aspect of economic sustainability was presented using the economic sustainability modelling that employed corporate social responsibility budgeting, research and development budgeting, affordability of finance, performance management utilization and fair trade accreditation to leverage firms trajectory .Different firms portrayed varying capabilities based on each of these tools. Above all, the chapter described the effects of value chain constraints on performance of floriculture industry in Kenya.

CHAPTER FIVE: DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

Chapter five presented a discussion of the findings and placed the study's results in the appropriate gap that needed to be filled in the literature. The discussion entailed relating the findings to the existing literature, and identifying the new information that helps to fill the research gap. Secondly, the chapter summarized the research findings into conclusion statement which were linked to the study objectives. The conclusions acted as the basis for recommendations for policy formulation, practice and future research.

5.2 Discussions

5.2.1 Discussion of the General Information

The study described the characteristics of floriculture value chain used in Kenya. The analysis revealed that the farms differed in characteristics across different categories and across different types of cut flowers grown. Some categories of the farms grew one type of cut-flower while other grew different types. In particular, all the farms under the breeder category had roses as the type of cut flowers grown and traded. Similarly, all the farms under the small scale category had summer flowers as the type of flowers grown. On the contrary, all the enabler firms had both summer flowers and roses as the type of cut flowers traded. However, medium and large-scale farms had either roses or both roses and summer types of cut flowers that were grown and traded.

Also, the analysis revealed that farms differed in terms of area, both in size and ownership production, leased area and owned area. Among the farms in the breeder firm's category, the area averaged at 2.833 ha. While that of medium and large-scale farm's category was equal to 31 ha and 20.25 ha for the roses and summer flowers, respectively. For the small-scale farmer groups, the area averaged at 2.58 ha. The results indicated that medium and largescale farms category had the largest parcels of land, where both roses and summer flowers were grown. This is followed by the breeder category and lastly small-scale farms.

For the number of stems produced, a notable difference was also observed across farm categories. The farms in the breeder firm's category produced stems that averaged at 1,200,000 stems per Ha. per annum, while those at the medium and largescale farm category produced an average of 1,468,712.12 and 1,132,082 stems per Ha. Per annum for the roses and summer flowers, respectively. Further, among the small-scale farms, the average production was equal to 930,833.3

stems per Ha. Per annum. The results showed that the highest numbers of stems were produced by farms in the medium and large scale farm category that grew roses followed by the farms in the breeder category. The least number of stems was produced by farms in the small-scale farm's category that grew summer flowers. However, the production from all the categories was statistically large.

Comparison of the leased versus the owned area among the farms in the breeder category produced mean values equal to 3 and 2.333 ha, respectively. The results indicated that among the breeder firms, leased land was more popular than owned land. This is because most breeders are foreign based companies with a local office which indicate vertical integration from origin countries as an indicator of Global value chain led innovation (Matthee etal.2006).This helps transfer knowledge to the local population in the long term that is necessary for economic sustainability. On the contrary, the farms in the medium and large-scale farm's category that grew roses produced mean leased and owned land areas equal to 9.0667 and 24.667 ha, respectively. Also, the farms that grew summer flowers produced mean values of 0 and 21.00 ha, for the leased and owned land area, respectively. The results indicated that, as far as this category of farms is concerned, owned area was more popular than leased land. Similarly, the small-scale farms produced mean leased and owned land areas equal to 1.357 and 1.7883 ha, respectively, indicating that among the small-scale farms, owned land was more popular than leased land. These small parcels presented an efficiency challenge due to size, the small scale farmers were grouped into 10 so that they could be better managed under the out-growers model where growing, postharvest training and compliance were provided by the buying firm that had better systems and ability to employ technical field officers.

The study described the cost and profit structures along the floriculture value chain varied greatly. According to the study, the greatest costs were freight costs. From the analysis medium and large-scale farms incurred the highest costs especially those that adopted marketing strategy 1, 2 and 3 where they sold into Dutch Auctions and therefore paid for air freight. On the other hand, the small-scale farms sold through the out-grower model and therefore didn't incur freight costs. Despite this the small scale firms were making the least returns per unit item sold. Nonetheless, all the firms were making positive gains value capture, however technological upgrading remains a challenge especially for small scale holders explained by previous work by Whitfield and others (Whitfield et al.2020).

Besides, the study concluded that the major sources of inefficiencies included production, packaging, labor, and freight management. Among these sources of inefficiencies, freight was the most significant hindrance of returns. The findings revealed that freight cost took the largest share of the revenue and therefore the most significant cost. The study also indicated there were production-related inefficiencies, input utilization inefficiencies and governance systems. The inefficiencies were more common among small scale farms than other categories. The small-scale farms relied rudimentary input utilization e.g. application of on overhead irrigation and flood irrigation and some didn't have connection to power. The study revealed a strong joint association between marginal cost and performance. Also, the study showed that the marginal costs explained 85.9% of the variations on performance this is in conformity to previous study (Githere, G. (2017).

Also, the study revealed some significant sources of inefficiencies/bottlenecks along the chain that negates financial sustainability in floriculture value chain. According to the study, the most common inefficiencies among the small-scale farms were in inbound logistics and operations , Due to their small size, limited investment in procurement and other critical departments ,the cost of factors of production was high as well as limited access to credit and economies of scale .Specifically the researcher found some farms had no basic production facilities such as efficient irrigation systems, crop protection facilities , grading facilities ,cold rooms, power connectivity etc. (Mulangu F. 2017 Whitfield et al.2020). The small-scale farms relied on overhead irrigation and flood irrigation which is inefficient and not economically sustainable. The production efficiencies depicted by majority of small-scale farm groups were low and had no budgetary allocation for sustainability with rudimentary infrastructure. While medium and largescale farm had invested in inbound logistics in procurement department and had adequate infrastructure in cold rooms, grading halls, information technology, internet and data management systems, centralized fertigation systems using drip irrigation and centralized crop protection/spay and therefore ended up being more efficient in utilization of factors of production such as water resource and crop protection inputs. Medium and large scale were connected to the grid and some had power generation from solar and geothermal therefore ensuring power costs per unit ended up being lower and some even having power as a source of revenue where excess power is sold to the state. In operations, there was streamlined department with specialization in human resource management, finance and production. Many had set out standards of efficient ways to measure and ensure product conformity to quality as per the requirements of the customer therefore enjoying

higher control of their processes and thus more Valuable output for the customer. Other farms had horizontal integration with seed producers i.e., breeders therefore leveraging on research and development investment to successfully remain ahead with new varieties and novelties. Many had a focus on sustainable accreditations that provided a leverage to be more preferred by environmentally sensitive clientele thus generating value by attracting a premium. For example, in Fairtrade accredited farms and carbon neutral organizations. In return these premiums were further used to improve the social wellbeing of the communities.

Regarding the strategies that can be used to improve the business environment along the floriculture value chain, the sampled farms were found to use several strategies in an attempt to improve their business environment along floriculture value chains. A common entry strategy highlighted by this study is the joint venture. This strategy allows the firms to take an investment position in a foreign location without taking on the complete responsibility for the foreign investment. Through joint ventures, farms have been able to effectively enter international markets through partners' complements (Whitfield et al.2020).

Also, farms were found to embrace innovation. Innovation-related internationalization model was adopted to examine how the farms progressed in the process of internalization. The results revealed that the process was characterized by stages with stagnation periods. A further discussion with the respondents revealed that the stagnations were influenced by the degree of involvement in the global economy (Matthee etal.2006).

Further, the export strategies commonly adopted by the sampled farms included optimization of the product quality, organization of the supply chain and product diversity. The farms in the medium and largescale category had, to a great extent, embraced diversification by growing both roses and summer cut flowers to almost equal magnitudes. Another common strategy adopted by the farms in Kenya was the export marketing strategy.

5.2.2 Discussion of the results on the effect of value chain strategy on performance/Economic sustainability

Project sustainability works by Chumo, (2012) looked at economic sustainability for Non-governmental organizations in Nairobi, Kenya from an internal financial performance perspective. It was clear that only profitable organizations were able to remain in business in the long term. The results of the sampled firms indicated a significant effect of value chain strategies on

performance/economic sustainability. Value chain strategies 4 and 5, direct/mass market had the best return per unit cut stem and therefore indicated the best strategy for performance and economic sustainability. Work by Njue, (2020) identified investment in research and development as a strategy that organizations used to ensure economic sustainability. Only profitable organizations would therefore be in a position to do research and development other value chain strategies, including strategy 1, strategy 2, and strategy3 had mean performance measurements of 0.7287 (SD=0.651), 1.2543 (SD=0.087), and 1.3268 (SD=0.28451), respectively. Generally, the value chain strategies 1, 2, and 3 (which relied on auctioneers) performed poorer than value chain strategies 4 and 5 (which relied on direct/mass market). The value chain participants were more in value chain strategy 1-3 thus the many participants suppressed the value back to the farm for products in a bid to get a share of the price and realize their profits. The participants also paid for the freight costs unlike their counterparts in direct market thus their cost ended up being higher per unit cut stem. As a result, those firms which relied on value chain strategies 1, 2, and 3, received lower value for their products compared to those that made use of direct markets.

5.2.3 Discussions of the results on the association between marginal cost and performance

The study revealed a strong joint association between marginal cost and performance. Also, the study showed that the marginal costs explained 85.9% of the variations on performance. The study obtained a test statistic equal to -0.712 with a p-value of $p<0.01$. The absolute value of the test statistic was greater than 0.7, revealing that there was a strong correlation between marginal cost and performance. Besides, the p-value was less than 0.05, implying the correlation between marginal cost and performance was statistically significant. The correlation implied that the increased costs hindered the firms' ability to maximize their profits. In fact, marginal costs increased if the firm was using undesirable strategies. For example, those firms using auctions instead of direct market had low returns.

The scatterplot diagram revealed a linear association between the two variables with few outliers. The slope was positive, implying that firms which had higher marginal costs made higher profits. However, the value of R-square was equal to 0.0071, implying that marginal costs explained only 0.07% of the variations in profit. The line of best fitted to the scatterplot had a slope of 0.0006, suggesting that firm's profit was expected to increase by 0.0006 units for a units change in

marginal costs. Both the R-squared and slope coefficients were low, indicating that, despite the significant correlation between the two variables, marginal cost was not a good predictor of performance of floriculture firms in Kenya.

5.2.4 Discussions of the results on the effects of value chain constraints on performance on floriculture industry in Kenya

Regarding the main effect of performance management, the study rejected the null hypothesis that the main effect of performance management on profit was insignificant. The study, hence, concluded that the main effect of performance management on performance of floriculture industry in Kenya was statistically significant. On the contrary, the p-values associated with the main effect of market access and the interaction effect between performance management and market access on profitability were greater than 0.05. Hence, the study concluded that both the main effect of market access and the interaction effect between performance management and market access on performance of floriculture industry in Kenya, were not statistically significant.

Performance management, as a corporate management tool, helps in monitoring and evaluating employee's work. Hence, based on the employee's potential, the management is able to select the best strategies, particularly the value chain strategies, to optimize profits. One of the main interests of studying the value chain would therefore be to enable investors to position their businesses where they can create and capture the greatest value sustainably to generate long time value for their investments. Performance management creates an environment where people can perform to the best of their abilities and produce the highest quality work most efficiently and effectively. Firms individually or in clusters have seek good performance management skills to deal with the urge to remain competitive by utilizing value chain approaches to streamline processes that generate goods and services that the customers value as well as guide in product and process innovation (Olga .Karpun ,2020).

Through the pairwise comparison, the study concluded that the lowest level, (very poor performance management) yielded significantly lower profits than other levels of performance management apart from level 2 (poor performance management). Similarly, level two was significantly different with all other levels of performance management apart from level 1. Level 3 of performance management was significantly different with levels 1 and 2. Also, levels 4 and 5

of performance management (good and very good) were significantly different with levels 1 and 2 (very poor and poor).

Through good performance management, firms achieve high levels of accountability and transparency. The management technique fosters a clear understanding of expectations. Managers in the floriculture industry in Kenya have used performance management tools to adjust workflow, recommend new courses of action, and make many decisions that have helped employees achieve their objectives. This explains why firms that recorded good performance management levels yielded better profits.

5.3 Conclusion

The study categorized firms according to different types of cut flowers they grew, land size and function as Small scale, medium and largescale, breeder firms and enablers. Small scale firms were largely on owned land unlike other categories that were on both owned and leased land. Firms dealing with Roses showed better production per square area than those of other summer cut flowers, however all categories of firms made some profits .The study evaluated two broad value chain strategies employed in floriculture, Direct marketing and Auction marketing. The firms that used direct market strategy enjoyed higher returns than those that used auctioneers and therefore were more economically sustainable. In the study horizontal integration of firms yielded better marginal costs and directly improved profitability and sustainability of firms. Further, the researcher found out that inputs from performance management tool improved marginal cost efficiency of floriculture firms and thus ended up enhancing profitability and sustainability of firms. The consumption of floriculture products is largely a western culture and therefore export market oriented, as such it is highly dependent on information flow from the market to the production firms in Kenya. This aspect brings about several constraints in production, packaging and freight. This study singled out freight costs as the main constraint on performance and sustainability of floricultural firms in Kenya.

5.4 Contributions to Knowledge

This study proved very important to the field of floriculture and horticulture in general. It highlighted the general outlook of the floriculture supply chain in Kenya and how it aligns to the Global Value chain. It described the various categories of floriculture chain actors, their costs and profit structures and ended up showing the best strategy in mass/direct market over auction

markets. The study highlighted the use of performance management as a tool to improve marginal costs efficiency in firms. Also, the study contributed to the existing knowledge by highlighting freight cost as the major constrain along the floriculture value chain that negated financial sustainability in the industry.

5.5 Recommendations

5.5.1 Recommendations for Policy

The analysis revealed that air freight was the main cost center that constrained economic sustainability in floriculture value chains in Kenya. An analysis of the factors contributing to the high-cost structure of existing airlines indicated that appropriate government initiatives can halve the costs of air freight costs in Kenya. Therefore, this study recommends that the government finds appropriate policies that would aim at lowering air freight costs to enhance growth of floriculture industry in Kenya .Stakeholders and government need to proactively engage around other alternatives such as Sea freight as an option for perishables such as cut flowers.

5.5.2 Recommendations for Practice

The study revealed that small-scale farms made the lowest margins per unit area, medium scale and largescale farms got considerable margin per unit area as well as enablers and breeders. Largely in small scale farm resources were inefficiently utilized, employed limited technology and had limited human resource management. When in farmer groups some level of training and pooling of resources helped deal with part of these inefficiencies, however, a lot remains to be done to support this lot of farmers. Hence, investors in the floriculture sector in Kenya are recommended to embrace intensive production in small scale farms or amalgamate small farms to medium and largescale farms where investment in innovation and technology suffice in-order to enjoy economies of scale and enable economic sustainability. The researcher recommends investment in joint research towards solving common problems via lobby bodies' e. g towards innovations in sustainable freight solutions for floriculture and mainstreaming performance management tools.

5.6 Suggestions for Future Research

Despite the findings showing that firms which used value chains 1-3 (strategy 1, auctions) had lower profits than those that used value chains 4-5(strategy 2, direct/mass market), descriptive analysis revealed that there is a large portion of the firms using strategy 1 that used auctioneers.

Hence, future researchers should investigate the factors which influence the choice of the strategies among Kenyan floriculture firms. Further, future research is recommended to embrace more of inferential statistics techniques such as t-test, ANOVA, and regression analysis methods to test hypotheses related to group comparison and cause and effect relationships. Such analysis methods will enhance inference statistics, which will enable estimation of population parameters and generalization of the results.

5.7 Limitations of the Research

The study was limited due to the choice of statistic techniques. The research relied heavily on descriptive statistics. Hence, it was not possible to test hypothesis and make conclusions based on inferential statistics across all variables. Also, the study was limited due to the choice of the research design. The researcher did not employ correlational design and therefore, it was not possible to reveal the cause-and-effect relationship between the independent variables such as farm category and type of cut flower grown, and dependent variables such as stem production and profit margins.

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APPENDICES

Appendix I: RESEARCH QUESTIONAIRE

PART A General information

Questionnaire No.: ___ Date of Interview: ___/___/_____ ID of Interviewer: _____

County: 1. Nairobi /2. Nakuru / 3. Nyandarua /4.Laikipia

Location of the business (town/village): _____

Population of village/town _____ Location: 1. Urban / 2. Rural

Average annual rainfall in the area _____

Name of enterprise: _____

Address of enterprise: _____

Phone number (mobile, if available) _____

Gender of the respondent: 1. Male / 2. Female

Q1. Function of the respondent in the farm: 1 Owner / 2 General manager /3 Supply chain manager

Q2. Age of respondent _____

Q3. How many years have you attended school altogether (including university, if applicable)? _____

Q4. How many years have you been running this business? _____

Q5. 5.1 How many permanent employees does your farm employ in total? _____

5.2 How many seasonal employees does your farm employ at peak season? _____

5.3 How many of your permanent employees are members of your family (apart from yourself)? _____

Q6. Is your farm registered with local authorities? 1 = Yes / 2 = No

Q7. How much land do you: A. own? _____ Hectares; B. lease in/rent in? _____ Hectares

Q8. How much of this land is under the crop?

a. = Below 2 Ha

b. = 2.1 -10 Ha

c. = 11-20 Ha

d. = 21-30 Ha

e. = 31-79 Ha

f. = Over 80 Ha

Q9. What kind of cut flowers do you grow/trade? From which source the primary income comes from?

Cut flower grown/ traded	Area (ha) / tonnage	Stems produced / Ha	Covered/open field

Q10. Please evaluate the development of your business over the last 24 months.

1. Declined significantly 2. Declined somewhat 3. Remained the same 4. Improved somewhat 5. Improved significantly

PART B Value Chain Analysis

Q.1 what are the steps of converting raw material to finished product does your organization employ?

From Fig. 1.3

a. Supply chain # 1
b. Supply chain # 2
c. Supply chain # 3
d. Supply chain # 4(mass market)
e. Supply chain # 5(mass market)

Q.2 How long does it take to convert inputs (harvested stem) to an output end product in stall for the client

Q.3 How is your product differentiated in the market place

E.g., Packaging, logo, sleeving,

Q4. What are your selling points?

Quality /Affordability/Availability

Q5. Do you benefit from other participants in the chain?

a. If yes, how?

Q6. How is competition

a. Activities: is the firm performing the right activities? Does it have what it takes to perform them?
b. Value: do customers perceive the value created by the strategy as unique? Is it better than competition?
c. Appropriability: does the firm make money from the value created?

d. Change: does the strategy take advantage of change (present or future) to create unique value and/or position itself to appropriate the value?

PART C Marginal Costs Analysis

Q1. How is the costs spread?

a. Production input costs per stem produced
b. Packaging input costs per stem produced
c. Local transport cost per stem produced
d. Labor cost per stem produced
e. Freight cost per stems sold
f. Farm rejection rate per annum
g. Farm average production per square meter

h. Selling and distribution costs

i. Other costs

Q2. What is the buying Price per stem/grade (cm) /ton?

	40cm	50cm	60cm
Percentage of grade			
Sweet heart			
Intermediate/spray			
Hybrid			
Tea hybrid			
Other			

Q3. What is the selling Price per stem/grade (cm)/ton?

	40cm	50cm	60cm
Percentage of grade			
Sweet heart			
Intermediate/spray			
Hybrid			
Tea hybrid			
Other			

PART D Challenges of Floriculture Value chains

Q1. In view of the current floriculture value chain state

a. Is there limitation due to perishability of the products that are dealt with
b. Is cold room space sufficient?
c. Are power costs to run cold stores conducive for business in reference to; Reliable, Affordable, Good Quality

Q2. Where do you get your financing? Cooperative /Bank/Other

How affordable is the facility/ affordable/relatively affordable /Not affordable?

Q3. Marketing and market orientation; Totally controlled by overseas chain actors/partially controlled by overseas chain actors/Have a degree of control and mutual understanding /Have total chain control

Q4. How do you acquire a new customer?

Q5. How can you describe performance management in your organization in a scale of 1-5 . (1 Not important 5, Very important)

Q6.Regular meetings on performance management will improve sustainability of floriculture firms .In a scale of 1-3 (1.Disagree 2.Somewhat agree 3.Totally agree)

Q7.What proportion of your budget goes to CSR (corporate social responsibility) _____

Q8.What proportion of your budget goes to research and Development?

Appendix 2: Cut flower supply chains actors from Kenyan producers to Consumers.

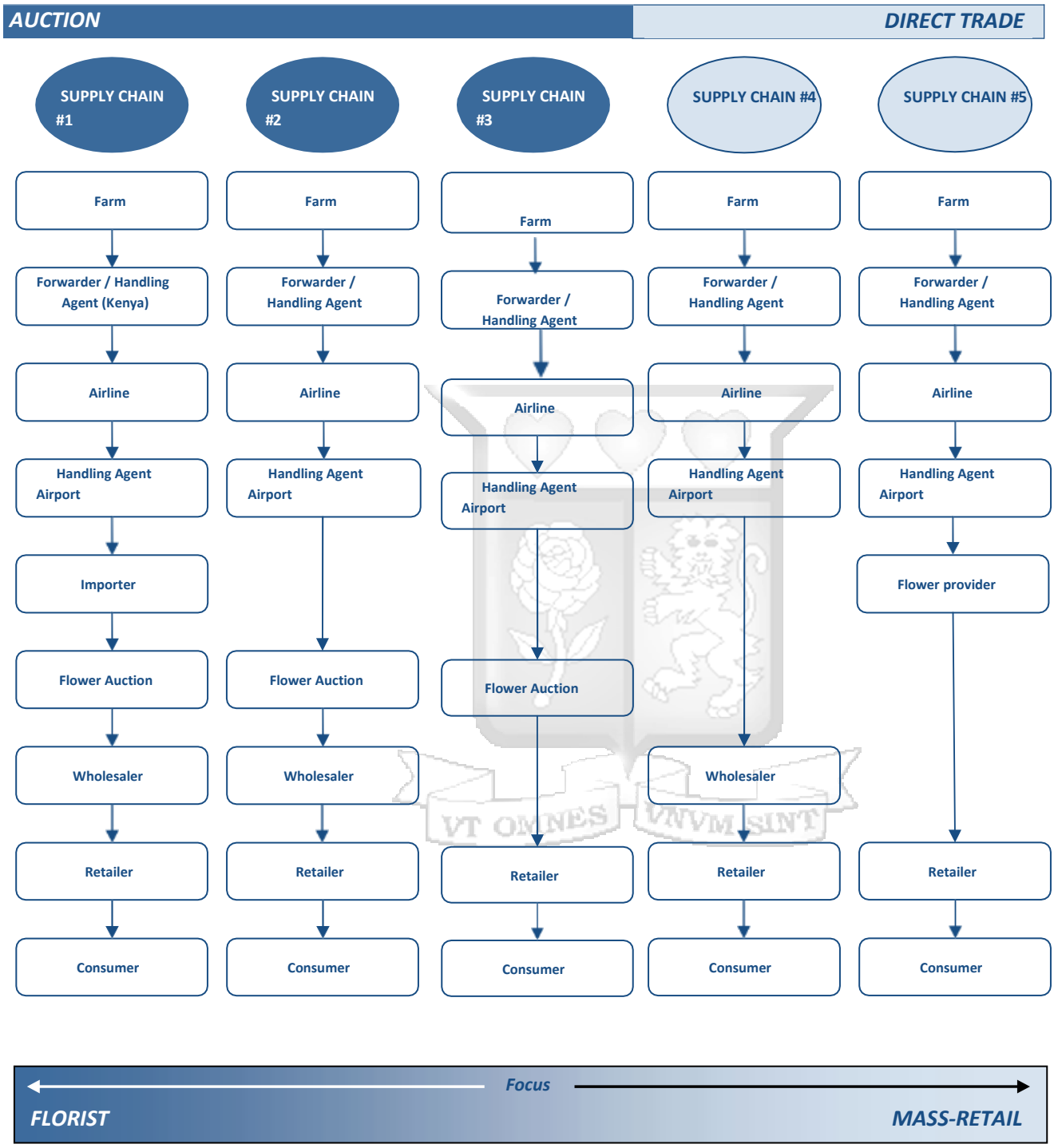

Fig. 1.3 Depicting Flower value chain main actors in each level of the chain from production to consumer. *Source:* (Hortiwise, 2012)

Appendix 3: The growth of Kenya's agro-food exports to the EU between 2000 and 2009

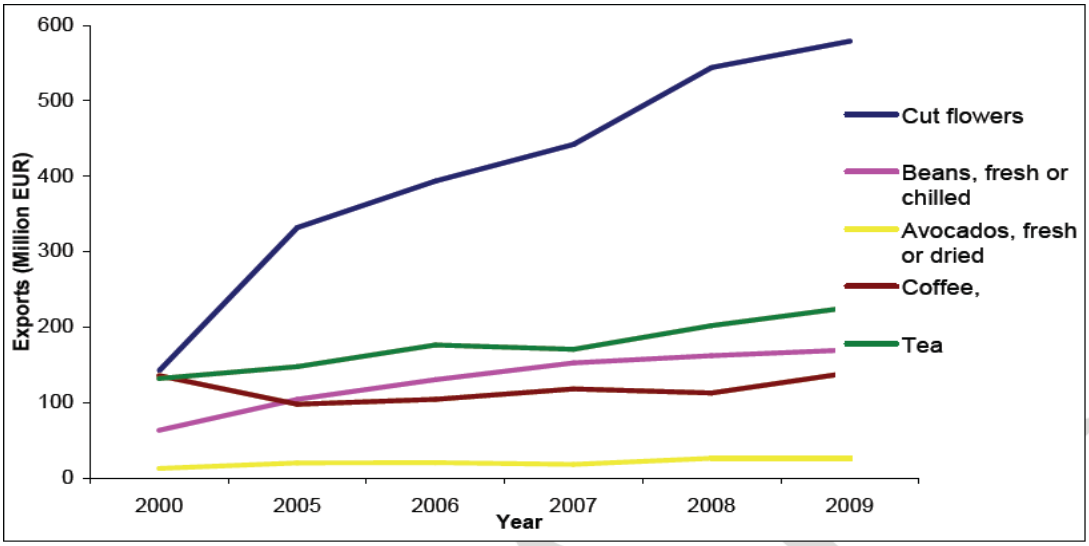

Fig 1.1: The growth of Kenya's agro-food exports to the EU between 2000 and 2009

Appendix 4: Floriculture revenues and volumes between 2010 and 2017

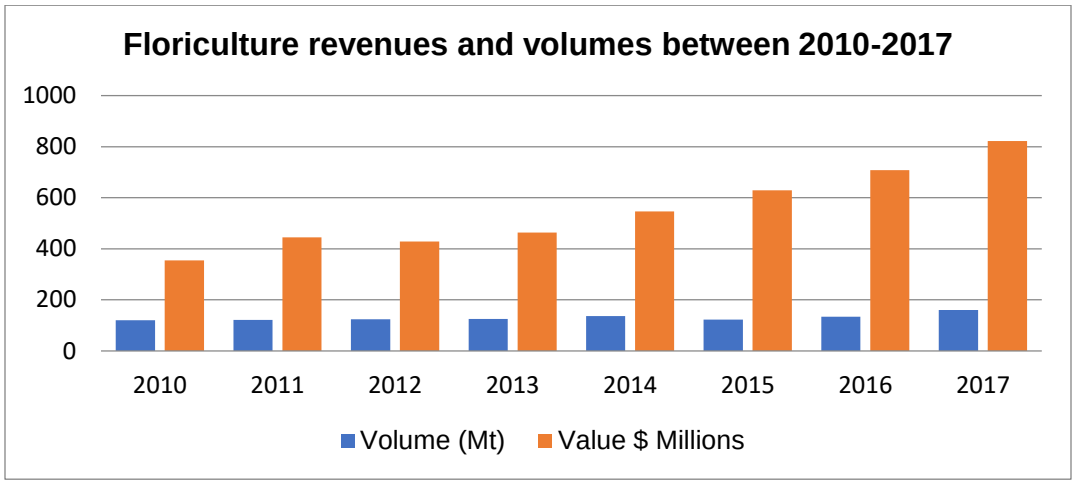

Figure 1.2: Floriculture revenues and volumes 2010-2017. Source: (HCD, 2018)

Appendix 5: ETHICAL APPROVAL FORM

Strathmore UNIVERSITY

13th July 2021

Mr Njogu George,
george.njogu@strathmore.edu

Dear Mr Njogu,

RE: Floriculture value chain analysis and economic sustainability in Kenya

This is to inform you that SU-IERC has reviewed and **approved** your above **master's** research proposal. Your application reference number is **SU-IERC0915/20**. The approval period is **13th July 2021 to 12th July 2022.**

This approval is subject to compliance with the following requirements:

i. Only approved documents including (informed consents, study instruments, MTA) will be used
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by SU-IERC.
iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to SU-IERC within 48 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to SU-IERC within 48 hours
v. Clearance for export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of an executive summary report within 90 days upon completion of the study to SU-IERC.

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) https://research-portal.nacosti.go.ke/ and also obtain other clearances needed

Yours sincerely,

for: Dr Virginia Gichuru,
Secretary; SU-IERC

STRATHMORE UNIVERSITY INSTITUTIONAL ETHICS REVIEW COMMITTEE (SU-IERC)
13 Jul 2021
TEL: +254 (0)70303400
P.O BOX 59857-00200
NAIROBI-KENYA

Cc: Prof Fred Were,
Chairperson; SU-IERC

Ole Sangale Rd, Madaraka Estate. PO Box 59857-00200, Nairobi, Kenya. Tel +254 (0)703 034000
Email admissions@strathmore.edu www.strathmore.edu

Appendix 6: RESEARCH LICENCE

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR
SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **566090**

Date of Issue: **25/May/2022**

RESEARCH LICENSE

This is to Certify that Mr.. George. Muchichu Njogu of Strathmore University, has been licensed to conduct research in Laikipia, Nairobi, Nakuru, Nyandarua on the topic: FLORICULTURE VALUE CHAIN ANALYSIS AND ECONOMIC SUSTAINABILITY IN KENYA for the period ending : 25/May/2023.

License No: **NACOSTI/P/22/17799**

566090

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR
SCIENCE,TECHNOLOGY &
INNOVATION

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