

**IMPACT OF SUPPLY CHAIN MANAGEMENT RISKS  
AND CHALLENGES ON PERFORMANCE OF FOOD  
MANUFACTURING FIRMS IN GREATER NAIROBI,  
KENYA**

**BY**

**MBOTHU GEORGE NJOROGE**

**A Research Project Submitted In Partial Fulfillment Of The  
Requirement For The Award Of The Degree Of Master Of  
Business Administration (MBA), School Of Business,  
University Of Nairobi**

**NOVEMBER, 2014**

## **DECLARATION**

I declare that this research project is the result of my own independent investigation and has never been presented in other University or college for any academic purpose.

**Signature** ..... **Date**.....

**Mbothu George Njoroge**

**D61/79493/2012**

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

**Signature** ..... **Date**.....

**Mr. T. O. KONGERE**

Lecturer

School of business

University of Nairobi

## **ACKNOWLEDGEMENTS**

I am grateful to God who has seen me through my journey in the university doing my studies. I would like to acknowledge my supervisor Mr. T.O. Kongere for the constant encouragement and support to finish my research project.

Finally I am grateful to my family and friends who were quite influential in my work. Thanks to my wife Serah Muthoni for her support both morally and financially. To my little boys Brian and Ronnie for their sweet little words of encouragement that gave me strength and courage to study more to enable a successful completion of my program.

## **DEDICATION**

To my wife Serah Muthoni and my sons Brian and Ronnie, it is through your support, prayers and selfless assistance that this was possible.

To all my parents for the support, words of advice and encouragement to keep on working hard in furthering my education.

## **ABSTRACT**

The government of Kenya should realize that sustainable business development is among the main goals of the millennium development goals. In this realization it would be therefore critical for the government to be on the forefront in terms of policy formulation towards development of food manufacturing firms and empowering small scale farmers in their food production. This will help in making Kenya a food sufficient country in line with vision 2030. Incentives on the food manufacturers should be on the forefront since only incentives with economic benefit will entice the business community to embrace food manufacturing for sustainable development in the country. Relevant technology could also be subsidized where appropriate. Enforcement of laws and implementation of structures for fair business practice should be implemented. The government could also take up private public partnerships with food manufacturers to ensure food security in the country is enhanced. This study was carried out to ascertain the impact of supply chain management risks and challenges facing food manufacturing firms in greater Nairobi Kenya and their effects on performance. The objectives were: to establish the risks and challenges facing food manufacturing supply chain management in greater Nairobi Kenya and to determine the effects of supply chain risks and challenges on performance of food manufacturing firms in greater Nairobi Kenya. The study adopted descriptive survey research design where a census of all food manufacturing firms was obtained. Data was successfully collected from supply chain managers or their equivalents, analyzed using Statistical package for social sciences (SPSS) and presented using percentages, mean, standard deviation in the form of tables and graphs. Regression analysis was used to determine the effects of supply chain risks and challenges on performance of food manufacturing firms in greater Nairobi Kenya. The findings of the study indicate that the main supply chain management risks are security risks; demand risks; supply risks and operational risks. The main supply chain management challenges are also outlined. The regression analysis produced a model that shows proper management of supply chain management risks and supply chain management challenges would lead to increase in firm's performance. The study encountered limitations such as inadequate time and delays by respondents putting pressure on the time allocated for completing the project.

## TABLE OF CONTENTS

<b>DECLARATION.....</b>	<b>i</b>
<b>ACKNOWLEDGEMENTS .....</b>	<b>ii</b>
<b>DEDICATION.....</b>	<b>iii</b>
<b>ABSTRACT.....</b>	<b>iv</b>
<b>LIST OF TABLES .....</b>	<b>viii</b>
<b>LIST OF FIGURES .....</b>	<b>ix</b>
<b>LIST OF ABBREVIATIONS.....</b>	<b>x</b>
<b>CHAPTER ONE: INTRODUCTION.....</b>	<b>1</b>
1.1 Background to the study.....	1
1.1.1 Supply Chain Management risks and challenges .....	2
1.1.2 Food manufacturing firms in Kenya .....	4
1.1.3 Greater Nairobi .....	6
1.2 Statement of the research problem .....	6
1.3 Objective of the study.....	9
1.4 Value of the study .....	9
<b>CHAPTER TWO: LITERATURE REVIEW.....</b>	<b>11</b>
2.1 The concept of supply chain management risks and challenges .....	11
2.2 Food manufacturing supply chain management risks and challenges .....	19
2.3 Effects of risks and challenges on firm's performance .....	22
2.4 Summary and research gap.....	23
2.5 Conceptual framework .....	24
<b>CHAPTER THREE: RESEARCH METHODOLOGY .....</b>	<b>25</b>
3.1 Introduction .....	25
3.2 Research design .....	25

3.3 Target population .....	25
3.4 Census.....	26
3.5 Data collection .....	26
3.6 Data analysis .....	26
<b>CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSIONS .....</b>	<b>28</b>
4.0 Introduction .....	28
4.1 Respondents characteristics .....	28
4.2 Organizational profile.....	28
4.3 Duration of existence of organization.....	29
4.4 Existence of supply chain management department .....	30
4.5.1 Supply chain management risks faced by food manufacturing firms in the greater Nairobi.....	30
4.5.2 Supply chain management challenges faced by food manufacturing firms in the greater Nairobi.....	32
4.6 Effects of supply chain management risks on service delivery of food manufacturing firms in the greater Nairobi...	36
4.7 Effects of supply chain management challenges on service delivery of food manufacturing firms in the greater Nairobi...	37
4.8 Effects of supply chain management risks and challenges on performance of food manufacturing firms in the greater Nairobi .....	39
<b>CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS.....</b>	<b>47</b>
5.0 Introduction .....	47
5.1 Summary of findings.....	47
5.2 Conclusion and recommendations.....	47
5.3 Limitations of the study .....	48
5.4 Suggestions for further Study.....	49
<b>REFERENCES.....</b>	<b>50</b>
<b>APPENDICES .....</b>	<b>55</b>

Appendix 1: Questionnaire.....	55
Appendix 2: List of food manufacturing firms in Kenya .....	59
Appendix 3: List of food manufacturing firms in Greater Nairobi.....	62

## LIST OF TABLES

Table 4.1 Supply chain management risks faced by food manufacturing firms in greater Nairobi Kenya .....	31
Table 4.2 Supply chain management challenges faced by food manufacturing firms in greater Nairobi Kenya .....	32
Table 4.3 Effects of supply chain management risks on service delivery .....	36
Table 4.4 Effects of supply chain management challenges on service delivery .....	37
Table 4.5 Regression Coefficients .....	40
Table 4.6 Model Goodness of Fit .....	41
Table 4.7 Correlation analysis of supply chain management risks .....	41
Table 4.8 Correlation analysis of supply chain management challenges.....	43
Table 4.9 Analysis of Variance (ANOVA).....	45

## LIST OF FIGURES

Fig 2.1 Conceptual Model.....	24
Fig 4.1 Type of the organization.....	29
Fig 4.2 Duration in operation.....	29
Fig 4.3 Existence of supply chain management department.....	30

## **LIST OF ABBREVIATIONS**

ANOVA	Analysis Of Variance
GDP	Gross Domestic Product
NGO's	Non Governmental Organizations
KCEP	Kenya Cereal Enhancement Programme
Ms Excel	Microsoft Excel
NSE	Nairobi Stock Exchange
SPSS	Statistical Package for Social Sciences
SD	Standard Deviation

# CHAPTER ONE: INTRODUCTION

## 1.1 Background to the study

Early food processing techniques were limited by the available food preservation techniques, packaging and transportation methods. The processing involved salting, curing, curdling, drying, pickling and smoking (Laudan, 2010). During industrial revolution in the 19th century, the manufacture of food emerged. This benefited from new markets, general public and new incipient technology, such as milling, conservation, packaging, labeling and transportation (Giles, 2014).

During the 21st century two types of food manufacturers emerged, one international giants of foodstuffs transformation making a range of well-known marks of food, and two a number of populous small local or national companies of foodstuffs transformation. The advanced technologies also came to change the manufacture of food. The computerized systems of order, sophisticated treatment and methods of packaging, and advances of logistics and distribution, can increase the quality of the product, improve safety of food, and reduce costs (Giles, 2014).

Political, economic, technological, environmental and social factors have always influenced operations within the food industry, affecting the efficiency, cost, variety, quality and availability of the products. When the food supply is ample, affordable and varied, it is the choices people make which determine the nutritional quality of their diets (Sibbel, 2012). A food supply chain refers to the processes that describe how food from a farm ends up on our tables. The processes include production, processing, distribution, consumption and disposal. The food we eat reaches us via food supply chains through which food moves systematically from producers to

consumers while the money consumers pay for food goes to people who work at various stages along the food supply chain in the reverse direction. Every step of the supply chain requires human and/or natural resources. When one part of the food supply chain is affected, the whole food supply chain is affected, which is often manifested through changes in price (Agricultural Marketing Service, 2014).

### **1.1.1 Supply Chain Management risks and challenges**

A supply chain consists of all parties involved, directly or indirectly, in fulfilling a customer request. The supply chain includes not only the manufacturer and suppliers, but also transporters, warehouses, retailers, and even customers themselves. Within each organization, such as a manufacturer, the supply chain includes all functions involved in receiving and filling a customer request. These functions include, but are not limited to, new product development, marketing, operations, distribution, finance, and customer service (Chopra and Meindl, 2007).

Mentzer, DeWitt, Keebler, Min, Nix, Smith, and Zacharia (2001, p. 18) have defined supply chain management “as the systematic, strategic coordination of the traditional business functions and the tactics across the business functions within a particular organization and across organizations for the purposes of improving the long-term performance of the individual organizations and the supply chain as a whole”.

According to Organization for Economic Co-operation and Development (2003) risk refers to the combination of the probability that a potentially harmful event will occur and the potential damage such an occurrence would cause. Leat and Revoredo-Giha (2013) define supply chain risk as an event that adversely affects supply chain operations and its desired performance measures such as chain-wide service levels,

responsiveness and cost. Chopra and Sodhi (2004) classify risks as systematic risks and unsystematic risks. Systematic risks arise from those unavoidable factors in the environment over which the firm can have no control, while unsystematic risks arise from those factors which can be internally controlled by the firm. Ghoshal (1987) further classifies risks as: macroeconomic risks, policy risks, competitive risks, and resource risks. Macroeconomic risks are associated with significant economic shifts in wage rates, interest rates, exchange rates, and prices; policy risks are associated with unexpected actions of national governments; competitive risks are associated with uncertainty about competitor activities in the markets; and resource risks are associated with unanticipated differences in resource requirements in the markets. Regardless of the area of interest, risk is associated with an undesirable loss, i.e. an unwanted negative consequence, and uncertainty.

A challenge is an element in the environment that could cause trouble for the business or project (Chopra and Sodhi, 2004). Previous studies reported that the effective implementation of supply chain management contribute to organizational performance (Chopra and Meindl, 2007) however supply chain risks and challenges create uncertainties in the supply chain which can lead to losses and shortage of the final product (Van Wassenhove, 2006).

Storey, Emberson, Godsell, and Harrison (2006) state that some of the supply chain management risks faced by food manufacturing firms includes supply risks, demand risks, operational risks and security risks. The supply chain management challenges include logistical challenges for their raw materials, poor infrastructure especially roads leading to post harvest losses, low yields obtained by many small scale farmers, limited access to new crop varieties affecting quality and tastes of the final

manufactured food, fluctuations of demand & supply and poor forecast and accuracy, farmers / farmers organizations relationship management, wrong use of pesticides affecting the taste and increasing health risks, raw materials that are highly perishable especially fruits and vegetables, challenges in cost control as a result of increased cost of doing business due to poor infrastructure, poor planning and risk management.

### **1.1.2 Food manufacturing firms in Kenya**

The food manufacturing industry prepares food products ready for sale and consumption (Blackman, 2005). Food manufacturing firms in Kenya depend on agriculture which is the major contributor of the Kenyan economy. Agriculture is the leading economic sector, accounting for 24% of the gross domestic product (GDP) and 27% of GDP indirectly through linkages with manufacturing, distribution and other service related sectors (Food Security Report, 2008).

The Kenyan food-processing sector, including food, beverages and tobacco, remains the largest component of the manufacturing industry. Food and beverages manufacturing make up over half of the Kenya's exports and agro-processing is progressively the largest manufacturing sub sector. Businesses range from small family owned enterprises to large businesses listed in the Nairobi stock exchange (Kenya National Bureau of Statistics, 2009).

Kenyan food manufacturing firms (attached appendix 2) are local, foreign companies or as joint ventures with Kenyan shareholding to supply the domestic and international markets. Food manufacturing firms have become important in the achievement of national food security which is a key objective of the agricultural sector. Food security is defined as "a situation in which all people, at all times, have

physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life” (Kenya Food Security Steering Group, 2008 p. 1).

The growth in food manufacturing firms has seen new firms like the Jomo Kenyatta University of Agriculture and Technology/ Nissin foods Ltd which when complete the plant is expected to produce 70,000, 72 grams of noodles using locally sourced ingredients including sorghum a fact expected to generate income in the sorghum sector in Kenya (Jomo Kenyatta University of Agriculture and Technology Corporate Communications Office, 2014).

Performance is a concept that quantitatively or qualitatively determines those that are produced as a result of an intended and planned activity (Yildiz, 2010). Business performance is the evaluation of all the efforts devoted to achieving the business goals (Akal, 1992). Performance measurement can be carried out systematically for a business completely or it can also be conducted for a temporary period or for a specific aim. Each organization has some reasons of its own to measure performance. Businesses measure performance often to be able to determine whether they cover the needs of their clientele, to be capable of approving the truth of what they know about their activities and to reveal what they do not know, to determine if they are generally successful or not, to make sure that the decisions are made not based on emotional or assumptions but on real data, to bring to light the problematic fields or to determine those areas for future development (Parker, 2000).

### **1.1.3 Greater Nairobi**

Nairobi is the capital and largest city of Kenya. The city and its surrounding area also form the Nairobi County. The name "Nairobi" comes from the Maasai phrase Enkare Nyrobi, which translates to "cold water". It is popularly known as the "Green City in the Sun". Nairobi County was founded in 2013 on the same boundaries as Nairobi Province, after Kenya's 8 provinces were subdivided into 47 counties. Greater Nairobi consists of four counties (Nairobi, Kiambu, Kajiando and Machakos) out of 47 counties in Kenya and the area generates about 60% of the nation's wealth. (Nairobi metropolitan, 2014).

Nairobi is home to the Nairobi Stock Exchange (NSE), one of Africa's largest. The exchange is Africa's 4th largest in terms of trading volumes, and 5th largest in terms of Market Capitalization as a percentage of gross domestic product (GDP). Nairobi is the regional headquarters of several international companies and organizations. Goods manufactured in Nairobi include clothing, textiles, building materials, processed foods, beverages, and cigarettes, (Wikipedia, 2014).

## **1.2 Statement of the research problem**

The food manufacturing sector is an intrinsic part of the food chain which is influenced by a huge range of factors acting on other parts of the food system. Some of the factors are economic and technological which create risks and challenges in the operations of the food manufacturing firms (Blackman, 2005).

Several studies have been conducted on food manufacturing. Leat and Revoredo-Giha (2013) conducted a study on risk and resilience in agri-food supply chains the case of the ASDA PorkLink supply chain in Scotland. The study established the challenges

that have affected the Scottish pig sector in recent years and also highlighted the major risks that have impinged on its normal operation. Some of the risks and challenges identified are applicable to the food manufacturing sector.

Sibbel (2012) conducted a study on Public nutrition and the role of the food industry. The study established that with clear guidelines for sound governance and with public nutrition as the priority, these arrangements can guide future initiatives to effectively promote health protective dietary choices. In this way the food industry can make contribution to addressing the complex, diet-related public health issues of the twenty-first century.

Nyamu (2012) conducted a study on impact of supply chain management challenges on humanitarian organizations in Kenya. The study established that there is a very high level of uncertainty in demand, this is because relief demand is unknown both in size and type, and it is affected by dynamic and hard to measure factors such as disaster characteristics, local economy and infrastructure, social and political conditions that present unique challenges to relief fulfillment systems. The study also identified six main challenges affecting humanitarian organizations. The study only focused on supply chain management challenges on humanitarian organizations in Kenya.

Vashta (2012) conducted a study on green supply chain management and supply chain responsiveness on food and beverages manufacturing firms. The study established that the benefits of implementing green supply chain management were improvement in information systems, reduction of the environmental impact of business processes, savings in costs through utilization of available productive resources. However the

study was limited to Nairobi firms only and the findings may not be applicable to other companies in other industries in Kenya.

Molla (2011) conducted a study on green supply chain management practices in the food manufacturing industry in Kenya. The study found that green supply chain management practices adoption is still in its infancy among the food manufacturing companies in Kenya and that most of these companies have only planned to consider, or at most, are considering adoption except for eco-design practice which was currently under consideration. International firms had higher adoption rates of green supply chain management practices than local based firms. The study was limited only to food manufacturing firms only and therefore other sectors of the economy needs further analysis to bring out information on adoption of green supply chain management practices in Kenya.

Munyui (2011) conducted a study on food manufacturing firms in Kenya, focusing on inventory models in management of raw materials by food manufacturing firms in Kenya. The study focused on inventory models only. Moenga, (2011) conducted a study on supply chain management practices and challenges for the small scale tea sector in Kenya. The study's findings and challenges were limited to the small scale tea sector only and could not be applied to other companies in other industries.

Although several studies have been conducted in the area of food manufacturing, none has addressed the supply chain management risks and challenges on food manufacturing firms in greater Nairobi, Kenya and how they affect their performance. The risks and challenges food manufacturing firms face differ from one country to another. One country's risks and challenges may not be another country's risks and challenges. Therefore there is need to conduct a study to establish the food

manufacturing supply chain management risks and challenges in greater Nairobi, Kenya. This will assist in comparing the situation in Kenya with other countries. This study will seek answers to the following questions: what are some of the supply chain management risks and challenges faced by food manufacturing firms in greater Nairobi, Kenya? What is the impact of these risks and challenges on the performance of these firms?

### **1.3 Objective of the study**

- (i) To establish the risks and challenges facing food manufacturing supply chain management in greater Nairobi, Kenya.
- (ii) To determine the effects of supply chain risks on performance of food manufacturing firms in greater Nairobi, Kenya.
- (iii) To determine the effects of supply chain challenges on performance of food manufacturing firms in greater Nairobi, Kenya.

### **1.4 Value of the study**

The study will enable food manufacturing firms in Kenya and the entire region of the horn of Africa, to understand the supply chain management risks and challenges and develop appropriate strategies to manage them.

The findings of this study will add to the pool of knowledge in the field of food manufacturing, production and operations management.

It will also be of importance in aiding the government of Kenya in formulating policies relating to food security and challenges faced by food manufacturing firms.

Manufacturing and service organizations are also expected to borrow insights from this reading as they practically engage in supply chain management activities in their operations.

This study will also lay platform for further research as regards the supply chain management risks and challenges facing food manufacturing sector.

Other organizations such as Non Governmental Organizations (NGO's) dealing with food distribution to the needy, the general public may derive some information from the findings for their own interest and advice.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 The concept of supply chain management risks and challenges**

Supply chain activities include the following customer service, transportation, storage/warehousing, conversion/manufacturing, packaging, distribution, procurement/purchasing, clearing and forwarding, returns and disposal, payment, information flow, and inventory management (Chopra and Meindl, 2007).

The term supply chain management has risen to prominence over the past years (Cooper et al., 1997) and it refers mainly to managing the supply chain (Mentzer et al., 2001). Supply chain management is the integration of key business processes across the supply chain for the purpose of creating value for customers and stakeholders (Lambert and Knemeyer, 2004).

Supply chain management has emerged as one of the primary factors in determining the competitiveness of organizations. In today's competitive environment, businesses have realized that the competition is no longer dependent solely on the capabilities of individual businesses but on the capability of a tightly integrated supply chain (Prajogo and Sohal, 2013).

Risk is uncertainty and may involve the probability of losing money, possible harm to human health, repercussions that affect resources, and other types of events that affect a person's (or businesses') welfare (Harwood, Heifner, Coble, Perry, and Somwaru, 1999).

Zsidisin and Ritchie (2009) define supply chain risk as a potential occurrence of an incident or failure to seize opportunities of supplying the customer in which its

outcomes result in financial loss for the whole supply chain. Risks therefore can appear as any kind of disruptions, price volatility, and poor perceived quality of the product or service, or any event damaging the reputation of the firm.

Leat and Revoredo-Giha (2013) define supply chain risk as an event that adversely affects supply chain operations and its desired performance measures such as chain-wide service levels, responsiveness and cost. Today, many supply chain managers believe that there are multiple risks involved in a supply chain, and yet are often ill-equipped to handle the same. Many of the risk factors develop from a pressure to enhance productivity, minimize waste, remove supply chain duplication, and improve bottom line (Leat and Revoredo-Giha, 2013).

A challenge is an element in the environment that could cause trouble for the business or project (Chopra and Sodhi, 2004). According to council of supply chain management professionals supply chain challenges are elements in the environment that affects the overall functioning of the supply chain.

### **2.1.1 Types of supply chain management risks**

Price or market risk is associated with changes in the prices of output or inputs that may occur after production has been initiated. Production is often a lengthy process. Livestock production, for example, typically requires ongoing investments in feed, equipment and energy that may not produce returns for a prolonged period, thereby making price or market risk particularly relevant (Leat and Revoredo-Giha, 2013).

Institutional risk arises from changes in policies and regulations. This type of risk may take the form of unanticipated production constraints, such as subsidy changes for inputs or output. Other institutional risks may arise from changes in environment

related policies, such as adjustments in taxation or credit policy. Hardaker, Huirne, Anderson, and Lien, (2004) suggest that institutional risk may also embrace relationship risk which is the risk inherent in the dealings with business partners and include the breakdown of agreements between supply chain participants.

Production risk involves many uncontrollable factors that affect production such as the quantity and quality of raw materials, cost of labor, capacity available, and machine breakdown. Technology plays a part in reducing production risk (Hardaker et al., 2004).

Human or personal risks are common to all businesses. Business disruption may result from events such as the death, injury, or poor health of key workers. Asset risk is also common to all businesses and involves theft, fire, or other loss or damage to equipment, buildings and livestock (Miller, 1991).

Financial risk results from the way a firm's capital is obtained and financed. A business may be subject to fluctuations in interest rates on borrowed capital, or face cash flow difficulties if there are insufficient funds to pay creditors (Hardaker et al., 2004).

Process risks are associated with interruptions in the processes of creating value and managerial activity within the business, and control risks are those connected with a breakdown in or misapplication of the systems and standards that are used to control the processes (Mason-Jones and Towill, 1998).

Demand risks are those of a breakdown in the flow of product, information or revenues between an enterprise and its customers. Similarly, supply risk is that of a

breakdown in material and service supplies, information and monetary flows between an enterprise and its suppliers (Mason-Jones and Towill, 1998).

Environment risk refers to the events, which can directly impact on the company or its upstream and downstream supply system. They may be social, policy/political, economic, technological or natural environment developments/events, and collectively comprise the environment within which the supply chain has to operate (Miller, 1991).

### **2.1.2 Sources of supply chain management risks**

Ritchie and Marshall (1993) states that business and organizational risks emerge from the following sources: Environmental factors; Industry factors; Organizational factors; Problem-specific factors; Decision-maker related factors.

Environmental factors variables are those that affect the overall business context across industries (Ritchie and Marshall, 1993). According to Miller (1991), general environmental risk variables include political instability, shifts in government policy, macroeconomic uncertainties, social uncertainties, and natural uncertainties.

Industry factor variables include those that may not affect all sectors of the economy as a whole, but rather specific industry segments (Ritchie and Marshall, 1993). Miller (1991) categorizes industry-specific uncertainties into three: input market uncertainties, product market uncertainties, and competitive uncertainties. Input market uncertainty refers to the uncertainty surrounding the acquisition of adequate quantities and qualities of inputs into the production process. Product market uncertainty refers to unexpected changes in the demand for a company or industry's

output. Competitive uncertainty offers a broad category, covering the uncertainties associated with rivalry among existing firms and potential entrants into the industry (Miller, 1991).

Organizational factors refer to the primary variables that could be firm-specific yet impact the entire supply chain. These include operating, liability, research and development, credit, and behavioral uncertainties (Miller, 1991). Operating uncertainty regarding specialized labor or other inputs is often firm-specific but can still have an impact on the overall supply chain. Liability uncertainties are associated with unanticipated, harmful effects due to the production or consumption of a company's product. Product liability uncertainty relates to the prospect of legal or market actions against the producer. Credit uncertainty involves problems with collectibles. Kleindorfer and Saad (2005) argue that a primary supplier going out of business or facing severe financial hardships could be particularly harmful for the overall supply chain.

Problem specific factors are specific to a particular organization depending on how they manage and mitigate risk. Bettis and Hall (1982) argued that risk is endogenous to an organization in that organizations will have at least some influence on how they want to internally manage these risks. Problem specific risk could be influenced by: The structure of the overall risk and an understanding of the key variables and interrelationships involved (Ritchie and Marshall, 1993); Objectives and constraints influencing the resolution of the problem (Bettis and Hall, 1982).; Complexity of the decision task in its various dimensions (Cohen and Christensen, 1970).

Decision maker related factors are related to an individual or to a decision making group within an organization. They could be known to include the following: The decision maker's detailed knowledge/skill/experience/biases of the overall risk framework and issues involved therein; Information seeking behavior on the part of the decision maker(s); Institutional rules and procedures for taking decisions; Bounded rationality of the decision makers (Ritchie and Marshall, 1993).

### **2.1.3 Types of Supply Chain Management challenges**

Demand volatility, poor forecast and accuracy is one of the main challenge affecting supply chains. Market transparency and greater price sensitivity have led to lower customer loyalty. Product commoditization reduces true differentiation in both the consumer and business-to-business environments. Increasing volatility is a major issue. Demand volatility, supply volatility, poor forecast and accuracy are the biggest supply chain roadblocks currently faced by several firms and businesses (Storey et al., 2006).

Increased supply chain globalization over the years has become a major challenge. Future business growth will come primarily from new international customers and/or products that are customized to meet customer needs due to globalization. As a result, more than companies expect the complexity of their supply chains to grow significantly. Most companies expected growing complexity in the number and location of customers, counts and product variants, the majority expects a decrease in the number of manufacturing locations, primarily due to outsourcing, and in the number of suppliers they work with. Senior executives cannot just focus on supply chain operations to create efficiencies. The challenge is to integrate supply chain

execution with the overall corporate business strategy, and to use the supply chain as a catalyst for business transformation or business reinvention (Awad and Nassar, 2010).

Talent management has become the head ache of all human resource managers in the 21<sup>st</sup> century. As experienced supply chain managers retire, and organizations scale up to meet growing demand in developing markets, talent acquisition, training, and development is becoming increasingly important (Storey et al., 2006).

The ever growing costs have warranted a cost control strategy. Supply chain operating costs are under pressure today from rising freight prices, more global customers, technology upgrades, rising labor rates, expanding healthcare costs, new regulatory demands and rising commodity prices. To control such costs is a challenge to the supply chain organizations (Awad and Nassar, 2010).

Customer service is a priority for every competitive firm. Effective supply chain management is all about delivering the right product in the right quantity and in the right condition with the right documentation to the right place at the right time at the right price. However customers' tastes and preferences keep on changing and therefore an organization need to strategize their supply chain. Customer responsiveness leads to customer retention and revenue growth (Kelly, 2007).

Existing supply chain organizations are not truly integrated and empowered. The supply chain network is a dynamic and integrated system in which all firms integrated to increase the value of every chain. Integration is a process of redefining and connecting parts of a whole in order to form a new one. The supply chain organization needs to be treated as a single integrated organization and this is not easy. The

challenge is to make decisions that optimize the total supply chain, not one function or node something most companies realize, but still have a hard time achieving (Kelly, 2007).

Risk and opportunity management should span the entire supply chain from demand planning to expansion of manufacturing capacity and should include the supply chains of key partners. Supply chains must periodically be assessed and redesigned in response to market changes, including new product launches, global sourcing, new acquisitions, credit availability, the need to protect intellectual property, and the ability to maintain asset and shipment security. Most organizations lack supply chain risk management functions to plan and manage risks in their supply chain (Manuj and Mentzer, 2008).

Supplier/partner relationship management is important for a successful supply chain. Suppliers need to respond to the changing times and develop stronger relational and organizational competences. Since issues of quality and performance are the baseline measure for the customer-supplier interaction, any existing competences must support the achievement of this standard (Kelly, 2007).

#### **2.1.4 Sources of Supply Chain Management challenges**

Swift, dramatic order cutbacks have a bullwhip effect that can be felt through every inch of your supply chain. A rapid, drastic cut in orders due to an anxiously anticipated change in demand creates a ripple effect that reverberates throughout your supply chain. And once this wave of cutbacks begins, it cannot be stopped. The harshest results are often at the ends of your supply chain, those companies that provide the bits and pieces that make up the final product. In some extreme cases,

these ordered cutbacks can mean layoffs and plant closures for smaller suppliers and manufacturers (Manuj and Mentzer, 2008).

Long lead times causing delayed delivery will affect organizations inventory management. For example a lot can change in the 40 to 50 days while waiting for shipment to arrive. Beyond long lead times, troubles at sea can double expected delivery date with lost cargo, capsized freighters or even pirates. The clients will have to look for alternatives and this will have an effect on the firm (Storey et al., 2006).

Overemphasis on cost cutting will have negative effects on supply chain. Lean manufacturing is the latest trend to hit the manufacturing industry and every organization is looking into it. However, overemphasizing cost cutting can have detrimental effects on supply chain. Removing the extra slack in supply chain may expose your broken links, but it may also remove the flexibility thus need to be responsive to slight changes in orders, demands and products (Storey et al., 2006).

Lack of risk management strategies that can be used to reduce losses caused by risk. Risk is inevitable, it is up to supply chain managers to determine how to adapt to the unexpected changes and make the most of every situation. When faced with obstacles it is better to have a proactive plan in place, than a reactive, knee-jerk that can cause more damage than the problem itself. Having a solid risk management strategy can help mitigate common failures (Manuj and Mentzer, 2008).

## **2.2 Food manufacturing supply chain management risks and challenges**

Food manufacturing sector plays a big role in driving the Kenyan economy and ensuring a strong and healthy population (Food Security Report, 2008). However

these firms face a number of risks and challenges that must be acknowledged. The following risks and challenges of food manufacturing supply chain management are: supply risks, demand risks, operational risks, security risks; demand volatility and poor forecast and accuracy, challenges in coordinating and managing multiple supply chains among multiple players, lack of investment in technology and communication, challenges of transportation and accessibility, poor information integration (Storey et al., 2006).

Supply risk is the distribution of outcomes related to adverse events in inbound supply that affect the ability of the focal firm to meet customer demand (in terms of both quantity and quality) within anticipated costs and time, or causes threats to customer life and safety (Manuj and Mentzer, 2008). Businesses rely on forecasting tools to determine how much of a product it should produce. Demand risk refers to the idea that these forecasts may not accurately predict the amount of product that customers are willing and able to buy. Demand risks impacts elements of inbound supply, implying that a supply chain is unable to meet the demand in terms of quantity and quality of parts and finished goods. The outcome is labeled as a supply disruption (Shashank and Thomas, 2009).

Operations risk is the distribution of outcomes related to adverse events within the firm that affect a firm's internal ability to produce goods and services, quality and timeliness of production, and/or profitability (Manuj and Mentzer, 2008). Operational risks impacts elements within a supply chain, impairing its ability to supply services, parts or finished goods within the standard requirements of time, cost and quality. Operational risks affect client satisfaction, reputation and shareholder value, all while increasing business volatility (Chopra and Sodhi, 2004).

Security risk is the distribution of outcomes related to adverse events that threaten human resources, operations integrity, and information systems; and may lead to outcomes such as freight breaches, stolen data or proprietary knowledge, vandalism, crime, and sabotage (Manuj and Mentzer, 2008).

Demand volatility, supply volatility, poor forecasts and accuracy are the biggest supply chain roadblocks currently faced by many firms and businesses. Firms should focus on deepening collaboration with key customers to reduce unanticipated changes in demand, through implementing joint real-time planning with their key customers to have improved demand sensing i.e. understanding the market rate of demand in real time, rather than having to wait for after-the-fact reporting (Storey et al., 2006).

The level of adoption of information technology across supply chains is low, but also the awareness and the need for adoption are not very high. This means technological adoptive capabilities will impact on supply chain, this indicate that the strategic benefits of information and communication technologies may not be fully recognized (Prajogo and Sohal, 2013).

Beside bad weather conditions during growing or delayed harvesting, storage and transport are among the biggest risk factors when it comes to fruit and vegetable losses. On a global scale, the proportion of food becoming unfit for human consumption during transport and distribution is as high as one-fifth. This is because of infrastructural problems such as impassable roads and poor communication networks (Kim, 2014).

Challenges relating to greater visibility requirements of supply chain, lead time compression (end-to-end supply chain pipeline), and integrating processes with

supply chain partners have medium to high impact on the supply chains (Prajogo and Sohal, 2013). Poor planning and risk management is common in many supply chains. Supply chains must periodically be assessed and redesigned in response to market changes, including new product launches, global sourcing, new acquisitions, credit availability, the need to protect intellectual property, and the ability to maintain asset and shipment security (Manuj and Mentzer, 2008).

Transportation costs due to geographical distance and petrol supply/price will have an important impact on the supply chain strategies. The ever increasing global crude oil prices will have significant increase in the transportation costs which will affect costs of doing business, (Enkvist, Naucler, and Oppenheim, 2008).

Existing supply chain organizations are not truly integrated and empowered. The supply chain organization needs to be treated as a single integrated organization. Lee and whang (2001) defined integration as, the quality of the state of collaboration that exists among departments that are required to achieve unity of effort by the demands of the environment. Supplier /partner relationship must go beyond internal integration to include external entities that are players in a supply chain (Kelly, 2007).

### **2.3 Effects of risks and challenges on firm's performance**

Firm's performance comprises the actual output or results of a firm as measured against its intended outputs. Performance is a concept that quantitatively or qualitatively determines those that are produced as a result of an intended and planned activity (Yildiz, 2010). Business performance is the evaluation of all the efforts devoted to achieving the business goals (Akal, 1992). According to Richard, Devinney, Yip, and Johnson, (2009) organizational performance encompasses three

specific areas of outcomes: (a) financial performance profits, Return on assets, Return on investments etc. (b) Product market performance (sales, market share etc) and (c) Shareholder return (total shareholder return and economic value). Specialists in many fields are concerned with organizational performance including strategic planners, operations, finance, legal, and organizational development. In recent years many organizations have attempted to manage organizational performance using the balanced scorecard methodology where performance is tracked and measured in multiple dimensions such as : financial performance e.g. shareholders return; customer service; social responsibility e.g. corporate citizenship, community outreach and employees.

Supply chain risks and challenges are among the factors that can adversely affect the performance of an organization and may even lead to closure of an organization. Risks and challenges can also make it impossible for an organization to realize the seven rights of supply chain i.e. right product, to the right customer, at the right time, at the right place, in the right condition, in the right quantity, at the right cost (Council of Supply Chain Management Professionals).

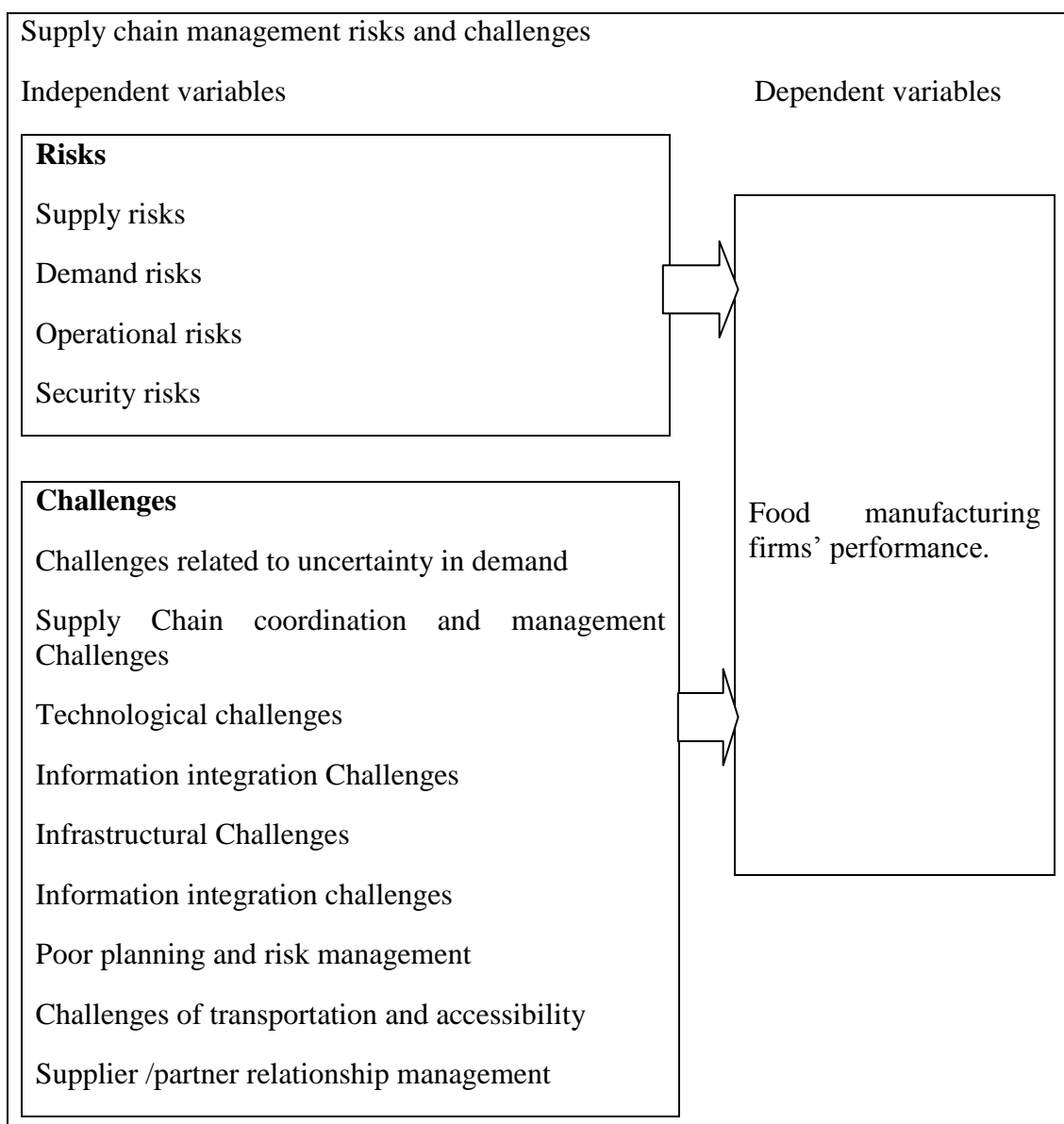
## **2.4 Summary and research gap**

Food manufacturing supply chain management is central to providing food at the right place, right time, right delivery and right price. The way supply chains are operated has a massive impact on the speed and quality of service that can be provided. Globally a number of risks and challenges have been identified as affecting food manufacturing supply chains. These risks and challenges are in most cases country specific. There is need to find out the risks and challenges that face food manufacturing supply chains in greater Nairobi and their impact on service delivery.

## 2.5 Conceptual framework

The supply chain management risks and challenges have an impact on the operations of food manufacturing firms. In the conceptual framework below, they are treated as independent variables that determine the level of impact on food manufacturing firms. Thus firms should therefore identify and mitigate these risks and challenges so that they can be able to provide food at the right place and price.

**Fig 2.1 Conceptual Model**



Source: Researcher 2014

## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1 Introduction**

This chapter highlights the methodology that was used to achieve the objectives of the study. Research design, target population, census, data collection and analysis will be discussed.

### **3.2 Research design**

Descriptive research design was adopted in conducting this study because it focuses on the investigation of the elements in their current state without necessarily making any changes to them. Descriptive survey design involves collection of data from a sample of a population in order to determine the current status of that population with respect to one or more variables (Mugenda and Mugenda 2003). This design allows the respondents to be observed and provide data without altering normal behavior. It was useful because measurement and observation in the most natural settings can be done using the descriptive design. Descriptive design enabled the researcher to describe the situation, get opinion on the subject and behavior without forming any relationships between variables.

### **3.3 Target population**

According to the Kenya Association of Manufacturers (2013) there are a total of 160 food manufacturing firms in Kenya (Appendix 2). There are 108 food manufacturing firms operating in greater Nairobi, Kenya (Appendix 3). 108 firms was therefore the target population for this study.

### **3.4 Census**

A census is the total evaluation of the entire group of people, events, elements, objects or things in the entire population. In this case the researcher conducted a census of all the food manufacturing firms in the greater Nairobi, Kenya.

### **3.5 Data collection**

The researcher used a questionnaire designed to collect primary data from supply chain managers or Logistics/ procurement managers or equivalent on supply chain management risks and challenges facing food manufacturing firms. The questionnaire contained both open ended and closed questions. The questionnaire was divided into two parts: Part 1 was dealing with the profile of the company and Part 2 was soliciting data on the supply chain management risks and challenges of food manufacturing firms in the greater Nairobi, Kenya.

### **3.6 Data analysis**

Content and thematic analysis was used for the qualitative data. Content analysis was used to gauge the intensity and frequency of use of words and phrases in the open ended questions. Thematic analysis was used where coded answers are regarded as being similar or referring to identical concepts. Both content and thematic analysis was used to address the first objective of the study. Regression analysis was used to address the second and third objective of the study. Data collected was analyzed using statistical package for social sciences (SPSS) and Ms Excel. This is because both SPSS and Excel are quite elaborate and offer wide choices in analysis and presentation of data. The regression model used is given below:

$$Y = a + \beta_1 X_1 + \beta_2 X_2 + E$$

Where: Y = Food manufacturing firm's performance

a = Constant of regression

X<sub>1</sub> = supply chain management risks

X<sub>2</sub> = supply chain management challenges

$\beta_1$  = sensitivity of food manufacturing firm's performance to the independent variables.

E = Error term

## **CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSIONS**

### **4.0 Introduction**

This chapter contains the summary of the respondent's data and a careful analysis of the questionnaires that were used in the data collection process. The purpose of the study was to investigate the impact of supply chain management risks and challenges on performance of food manufacturing firms in greater Nairobi Kenya.

### **4.1 Respondents characteristics**

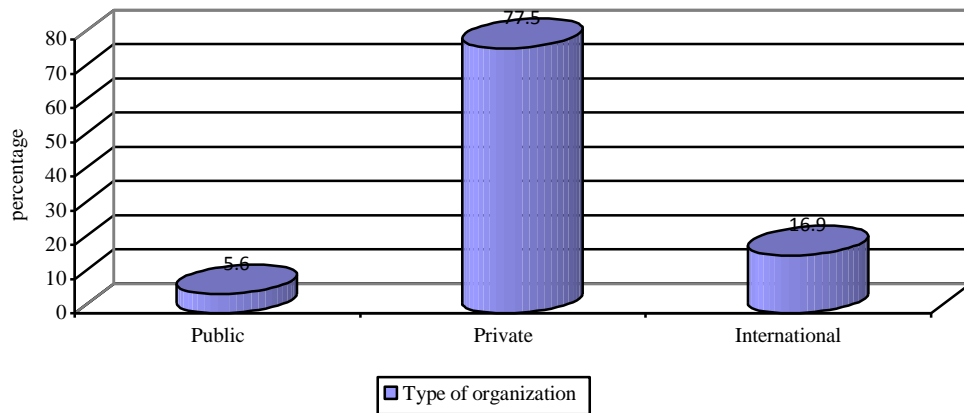
Seventy one firms out of the targeted one hundred and eight responded to the questionnaire. This represented a 65.74% response rate which is acceptable since according to Mugenda & Mugenda (2003) a response rate of 60% is good.

### **4.2 Organizational profile**

The study sought to find out the type of the organization. The findings are presented in the figure 4.1.

Figure 4.1 below reveals that majority of the respondents 77.5% indicated the organizations are private firms, 16.9% international firms and 5.6% public firms. The findings depict that majority of food manufacturing firms in the greater Nairobi are privately owned firms.

**Figure 4.1: Type of the organization**

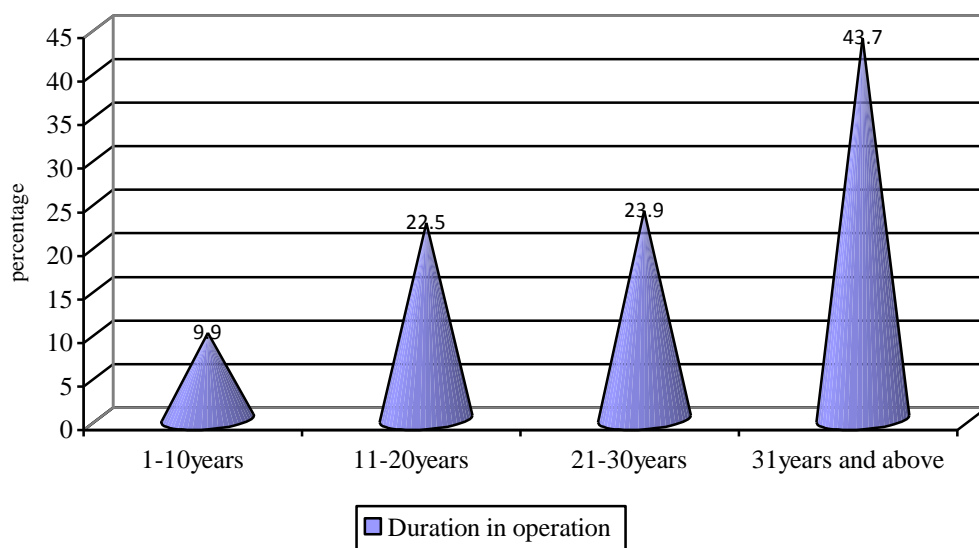


Source: Researcher (2014)

### 4.3 Duration of existence of organization

From the data analysis most of the organization had been in existence for over thirty years and therefore had considerable experience in the Kenyan food manufacturing environment.

**Figure 4.2: Duration in operation**

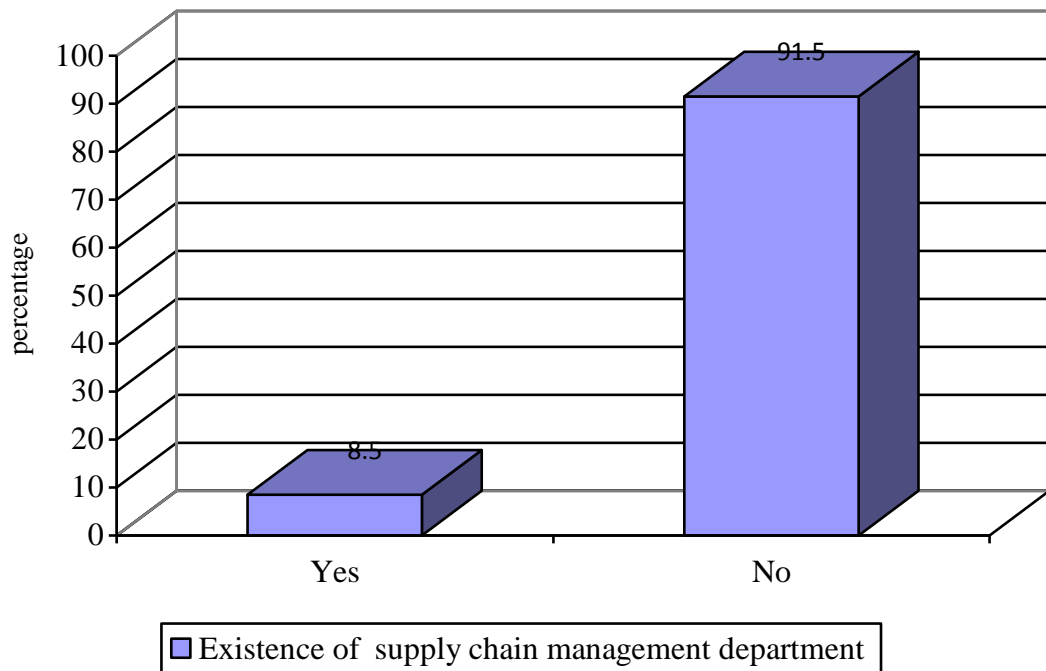


Source: Researcher (2014)

#### 4.4 Existence of supply chain management department

From the data analysis most of the organizations 91.5% do not have a supply chain management department, only 8.5% do have a supply chain department. The findings reveal the necessity of a supply chain management department in an organization.

**Figure 4.3: Existence of supply chain management department**



Source: Researcher (2014)

#### 4.5.1 Supply chain management risks faced by food manufacturing firms in the greater Nairobi

The study sought to find out the response from the respondents concerning the extent to which their organization faces the following supply chain management risks. The findings are shown in the table below:

**Table 4.1: Supply chain management risks faced by food manufacturing firms in greater Nairobi Kenya.**

	Strongly agree (%)	Agree (%)	Not sure (%)	Disagree (%)	Strongly disagree (%)	Mean	SD	Rank
Security risks are common in the organization	2.8	64.8	32.4	0.0	0.0	2.30	0.52	1
Demand risks are more prominent in the organization	1.4	94.4	4.2	0.0	0.0	2.03	0.24	2
Supply risks are more prevalent in the organization	8.5	87.3	4.2	0.0	0.0	1.96	0.36	3
Operational risks are more common in the organization	21.1	74.6	4.2	0.0	0.0	1.83	0.48	4

Source: Researcher (2014)

Table 4.1 shows that majority of the respondents agreed to the extent to which the organization faces the following supply chain management risks: demand risks are more prominent in the organization 94.4%, supply risks are more prevalent in the organization 87.3%, operational risks are more common in the organization 74.6%, and security risks are common in the organization 64.8%. A large proportion strongly agreed to the following statements concerning the extent to which the organization faces the following risks: operational risks are common in the organization 21.1% while 32.4% indicated not sure regarding operational risks are more common in the

organization. Table 4.1 depicts that the most common supply chain management risks are; demand risks, supply risks, and operational risks.

#### **4.5.2 Supply chain management challenges faced by food manufacturing firms in the greater Nairobi**

This section sought to find out the supply chain management challenges faced by food manufacturing firms in the greater Nairobi. The findings are shown in the table below:

**Table 4.2: Supply chain management challenges faced by food manufacturing firms in greater Nairobi Kenya.**

	Strongly agree (%)	Agree (%)	Not sure (%)	Disagree (%)	Strongly disagree (%)	Mean	SD	Rank
Ambiguity of supply chain activities results in resource limitation, high uncertainties and thereby making it difficult to assess the uncoordinated commitments of stake holders	77.5	22.5	0.0	0.0	0.0	2.23	0.42	1
Inability to anticipate shortages in raw materials for food manufacturing	1.4	97.2	1.4	0.0	0.0	2.00	0.17	2
Inadequate transportation modes present challenges in accessing surplus food producing areas	7.0	87.3	5.6	0.0	0.0	1.99	0.36	3

Limited view on the food supply chain management planning process	4.2	93.0	2.8	0.0	0.0	1.99	0.27	4
Supply chain management is not given emphasis and integrated systems support	7.0	88.7	4.2	0.0	0.0	1.97	0.34	5
Lack of transparency of information and knowledge across the supply chain	8.5	85.9	5.6	0.0	0.0	1.97	0.38	6
Lack of capital investment commitments in supply chain activities	8.5	87.5	4.2	0.0	0.0	1.96	0.36	7
The ever increasing source requirements affects the food supply chain management	8.5	87.3	4.2	0.0	0.0	1.96	0.36	8
Accessing the geographical areas where food raw materials are found present challenges	8.5	88.7	2.8	0.0	0.0	1.94	0.33	9
Limited communication planning affects the food supply chain management.	9.9	87.3	2.8	0.0	0.0	1.93	0.35	10
The role of supply chain management in food manufacturing operations is yet to be recognized.	9.9	88.7	1.4	0.0	0.0	1.92	0.33	11

High costs during rainy seasons inhibit our ability to access the food raw materials	11.3	85.9	2.8	0.0	0.0	1.92	0.37	12
Lack of proper planning of supply chain management	15.5	78.9	5.6	0.0	0.0	1.90	0.45	13
External complications due to foreign relations limiting cross border food exports and imports	14.1	81.7	4.2	0.0	0.0	1.90	0.42	14
Lack of training programs on supply chain management operations	11.3	88.7	0.0	0.0	0.0	1.89	0.32	15
Trade tariffs, quotas and domestic barriers limit access to food raw materials	16.9	83.1	0.0	0.0	0.0	1.83	0.38	16
There is a very high level of uncertainty in demand	29.6	70.4	0.0	0.0	0.0	1.70	0.46	17
It is hard to coordinate and manage multiple players along the supply chain	50.7	49.3	0.0	0.0	0.0	1.49	0.50	18
Poor infrastructure	54.9	42.3	2.8	0.0	0.0	1.48	0.56	19
Increase in global oil prices affects the transportation costs	54.9	45.1	0.0	0.0	0.0	1.45	0.50	20

Source: Researcher (2014)

Table 4.2 shows that majority of the respondents agreed to the following statements concerning the extent to which the organization faces the following supply chain management challenges: inability to anticipate shortages in raw materials for food manufacturing 97.2%, limited view on the food supply chain management planning process 93.0%, the role of supply chain management in food manufacturing operations is yet to be recognized 88.7%, supply chain management is not given emphasis and integrated systems support 88.7%, lack of training programs on supply chain management operations 88.7%, accessing the geographical areas where food raw materials are found present challenges 88.7%, lack of capital investment commitments in supply chain activities 87.5%, inadequate transportation modes present challenges in accessing surplus food producing areas 87.3%, limited communication planning affects the food supply chain management 87.3%, the ever increasing source requirements affects the food supply chain management 87.3%, high costs during rainy seasons inhibit our ability to access the food raw materials 85.9%, lack of transparency of information and knowledge across the supply chain 85.7%, trade tariffs, quotas and domestic barriers limit access to food raw materials 83.1%, external complications due to foreign relations limiting cross border food exports and imports 81.7%, lack of proper planning of supply chain management 78.9%, and there is a very high level of uncertainty in demand 70.4%.

A large proportion strongly agreed to the following statements concerning the extent to which the organization faces the following challenges: ambiguity of supply chain activities results in resource limitation, high uncertainties and thereby making it difficult to assess the uncoordinated commitments of stake holders 77.5%, poor infrastructure 54.9%, increase in global oil prices affects the transportation costs

54.9% and it is hard to coordinate and manage multiple players along the supply chain 50.7%.

#### **4.6 Effects of supply chain management risks on service delivery of food manufacturing firms in the greater Nairobi**

The study sought to find out the extent to which the respondent agrees with the following statements concerning the effects of supply chain risks and challenges on food manufacturing firm's performance. The findings are shown in the table below:

**Table 4.3: Effects of supply chain management risks on service delivery**

	Strongly agree (%)	Agree (%)	Not sure (%)	Disagree (%)	Strongly disagree (%)	Mean	SD	Rank
Security risks affects the firm's ability to meet customer needs	26.8	73.2	0.0	0.0	0.0	1.73	0.45	1
Supply risks affects the firm's ability to meet customer demand	31.0	69.0	0.0	0.0	0.0	1.69	0.47	2
Demand risks affects customers willingness and ability to buy	39.4	60.6	0.0	0.0	0.0	1.61	0.49	3
Operational risks affects client satisfaction, reputation and shareholder value, all while increasing business volatility	52.1	47.9	0.0	0.0	0.0	1.48	0.50	4

Source: Researcher (2014)

Table 4.3 reveals that majority of the respondents agreed to the following statements regarding the effects of supply chain risks: security risks affects the firm’s ability to meet customer needs 73.2%, supply risks affects the firm’s ability to meet customer demand 69.0%, demand risks affects customers willingness and ability to buy 60.6%, and operational risks affects client satisfaction, reputation and shareholder value, all while increasing business volatility 47.9%. A large proportion strongly agreed to the following regarding the effects of supply chain risks: operational risks affects client satisfaction, reputation and shareholder value, all while increasing business volatility 52.1%, demand risks affects customers willingness and ability to buy 39.4% and supply risks affects the firm’s ability to meet customer demand 31.0%.

#### **4.7 Effects of supply chain management challenges on service delivery of food manufacturing firms in the greater Nairobi**

The study sought to find out the extent to which the respondent agree with the following statements concerning the challenges on food manufacturing firm’s performance. The findings are shown in the table below:

**Table 4.4: Effects of supply chain management challenges on service delivery**

	Strongly agree (%)	Agree (%)	Not sure (%)	Disagree (%)	Strongly disagree (%)	Mean	SD	Rank
Benefits of information and communication technologies may not be recognized thus affecting performance	7.0	93.0	0.0	0.0	0.0	1.93	0.26	1

Poor operations may derail delivery of products at the right time	14.1	85.9	0.0	0.0	0.0	1.86	0.35	2
Poor information integration affect delivery of product to right place	16.9	83.1	0.0	0.0	0.0	1.83	0.38	3
Lack of proper information affects delivery of the right product	16.9	83.1	0.0	0.0	0.0	1.83	0.38	4
Supplier failure may affect quantity delivered	26.8	73.2	0.0	0.0	0.0	1.73	0.45	5
Poor storage facilities affect the right condition and quality of the products	31.0	69.0	0.0	0.0	0.0	1.69	0.47	6
Inaccessible locations may affect delivery at the right time	35.2	64.8	0.0	0.0	0.0	1.65	0.48	7
Uncertainty in demand inhibits delivery of the right quantity	43.7	56.3	0.0	0.0	0.0	1.56	0.50	8
Poor infrastructure affects delivery of the right product.	52.1	46.5	1.4	0.0	0.0	1.49	0.53	9

Source: Researcher (2014)

Table 4.4 shows that majority of the respondents agreed to the following statements regarding challenges on food manufacturing firm's performance: benefits of information and communication technologies may not be recognized thus affecting

performance 93.0%, poor operations may derail delivery of products at the right time 85.9%, lack of proper information affects delivery of the right product 83.1%, supplier failure may affect quantity delivered 73.2%, poor information integration affect delivery of product to right place 83.1%, poor storage facilities affect the right condition and quality of the products 69.0%, inaccessible locations may affect delivery at the right time 64.8%, and uncertainty in demand inhibits delivery of the right quantity 56.3%. A large proportion strongly agreed to the following regarding challenges on food manufacturing firm's performance: poor infrastructure affects delivery of the right product 52.1% and uncertainty in demand inhibits delivery of the right quantity 43.7%.

#### **4.8 Effects of supply chain management risks and challenges on performance of food manufacturing firms in the greater Nairobi**

A multiple linear regression model was applied to determine the relative effects of supply chain management risks and supply chain management challenges on the firms performance. The regression model was as follows:

$$Y = a + \beta_1 X_1 + \beta_2 X_2 + E$$

Where: Y = Food manufacturing firm's performance

a = Constant of regression

X<sub>1</sub> = Supply chain management risks

X<sub>2</sub> = Supply chain management challenges

$\beta_1$  = Sensitivity of food manufacturing firm's performance to the independent variables.

E = Error term

**Table 4.5: Regression Coefficients**

		<b>Coefficients<sup>a</sup></b>				
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.739	.414		4.198	.000
	supply chain management risks	.087	.286	.037	.304	.762
	supply chain management challenges	.091	.286	.037	.337	.771

a. Dependent Variable: Food manufacturing firm's performance

From the data in the above Table 4.7, the established regression equation was:

$$Y = 1.739 + 0.087X_1 + 0.091X_2 + 0.284 \quad p=0.091$$

From the above regression model on Table 4.7, when the supply chain management risks and supply chain management challenges have null value; firm's performance would be 1.739. Holding other factors constant, a unit increase in supply chain management risks would yield an increase of 0.097 in firm's performance however t-significance value 0.702 was established depicting that supply chain management risks is significantly related with service delivery on manufacturing firms. A unit increase in supply chain management challenges would lead to a 0.091 increase in financial performance. A t-significance of 0.771 was established depicting a significant relationship with service delivery on manufacturing firms. This clearly shows that proper management of supply chain management risks and supply chain management challenges would lead to increase in firm's performance.

**Table 4.6: Model Goodness of Fit**

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.052 <sup>a</sup>	.003	-.027	.284

a. Predictors: (Constant), supply chain management challenges, supply chain management risks

The study used Table 4.5 to establish whether supply chain management has a linear dependence on the independent variables. The study established a correlation value of 0.052. This depicts a good linear dependence between the two variables. An R-square value of 0.003 was established and adjusted to 0.027. The coefficient of determination depicts that supply chain management risks and supply chain management challenges brings about 28.4% variations in a firm's performance; 71.6% of variations are brought about by factors not captured in the objectives.

**Table 4.7: Correlation analysis of supply chain management risks**

**Correlations**

		Supply risks affects the firm's ability to meet customer demand	Demand risks affects customers willingness and ability to buy	Security risks affects the firm's ability to meet customer needs	Operations risks affects client satisfaction, reputation and shareholder value, all while increasing business volatility
Supply risks affects the firm's ability to meet customer demand	Pearson Correlation	1			
Demand risks affects customers willingness and ability to buy	Pearson Correlation	.706**	1		
Security risks affects the firm's ability to meet customer needs	Pearson Correlation	.214	.358**	1	
Operations risks affects client satisfaction, reputation and shareholder value, all while increasing business volatility	Pearson Correlation	.216	.139	.261*	1

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

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

Source: Researcher (2014)

The Pearson's correlation co-efficient of supply chain management and Demand risks affects customers willingness and ability to buy is 0.706, Security risks affects the firm's ability to meet customer needs (0.214), and Operations risks affects client satisfaction, reputation and shareholder value, all while increasing business volatility (0.216). These coefficients imply that there exists a positive association of Demand risks affects customers willingness and ability to buy (70.6%), Security risks affects the firm's ability to meet customer needs (21.4%), and Operations risks affects client satisfaction, reputation and shareholder value, all while increasing business volatility (21.6%) to supply chain management.

**Table 4.8: Correlation analysis of supply chain management challenges**

		Correlations								
		1	2	3	4	5	6	7	8	9
1	Pearson Correlation	1								
2	Pearson Correlation	.454**	1							
3	Pearson Correlation	.104	.271*	1						
4	Pearson Correlation	.058	.243*	.515**	1					
5	Pearson Correlation	.152	.154	-.061	.173	1				
6	Pearson Correlation	-.006	.018	-.124	.015	.324**	1			
7	Pearson Correlation	-.103	-.175	-.140	-.018	.067	-.006	1		
8	Pearson Correlation	-.183	-.044	.079	.297*	.030	.225	.142	1	
9	Pearson Correlation	.317**	.258*	-.184	-.020	.331**	.257*	.023	.047	1

---

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

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

Where

- 1 = Poor information integration affect delivery of product to right place
- 2 = Inaccessible locations may affect delivery at the right time
- 3 = Poor storage facilities affect the right condition and quality of the products
- 4 = Uncertainty in demand inhibits delivery of the right quantity
- 5 = Supplier failure may affect quantity delivered
- 6 = Poor infrastructure affects delivery of the right product.
- 7 = Lack of proper information affects delivery of the right product
- 8 = Poor operations may derail delivery of products at the right time
- 9 = Benefits of information and communication technologies may not be recognized thus affecting performance

The Pearson's correlation co-efficient of supply chain management and Inaccessible locations may affect delivery at the right time is 0.454 Poor storage facilities affect the right condition and quality of the products (0.104), Uncertainty in demand inhibits delivery of the right quantity (0.058), Supplier failure may affect quantity delivered (0.152), and Benefits of information and communication technologies may not be recognized thus affecting performance (0.317). These coefficients imply that there exists a positive association of inaccessible locations may affect delivery at the right time (45.4%), Poor storage facilities affect the right condition and quality of the products (10.4%), Uncertainty in demand inhibits delivery of the right quantity (5.8), Supplier failure may affect quantity delivered (15.2), and Benefits of information and

communication technologies may not be recognized thus affecting performance (31.7) to supply chain management.

The Pearson's correlation co-efficient of supply chain management and Poor infrastructure affects delivery of the right product is -0.006 Lack of proper information affects delivery of the right product (-0.103) and Poor operations may derail delivery of products at the right time (-0.183). These coefficients imply that there exists a negative association of Poor infrastructure affects delivery of the right product (0.6) Lack of proper information affects delivery of the right product (10.3) and Poor operations may derail delivery of products at the right time (18.3) to supply chain management.

**Table 4.9: Analysis of Variance (ANOVA)**

**ANOVA<sup>b</sup>**

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	.015	2	.007	.091	.091 <sup>a</sup>
Residual	5.478	68	.081		
Total	5.493	70			

a. Predictors: (Constant supply chain management challenges, supply chain management risks)

b. Dependent Variable: Food manufacturing firm's performance

Analysis of Variance was used to test the significance of the regression model as pertains to significance in the differences in means of the dependent and independent

variables. The ANOVA test produced an f-value of 0.091 which was significant at  $p=0.091$ . This depicts that the regression model is not significant at 95% confidence level. That is, it has 9.1% probability of misrepresentation.

## **CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

### **5.0 Introduction**

This chapter presents a summary of the results, discussions of the results and conclusions on the results. Also presented are limitations of the study and recommendations for further research.

### **5.1 Summary of findings**

The objective of the study was to establish the supply chain management risks and challenges facing food manufacturing firms and their effects on performance in the greater Nairobi Kenya. The study found that very few firms 8.5% do have a supply chain management department and yet 43.7% of the firms have been in existence for over 31 years therefore in the 21<sup>st</sup> century firms should embrace the importance of proper management of supply chain management risks and challenges. In the regression analysis, coefficient of determination depicts that supply chain management risks and supply chain management challenges brings about 28.4% variations in a firms performance, 71.6% of variations are brought about by other factors not captured in the objectives.

### **5.2 Conclusion and recommendations**

It is important that the government of Kenya realize that sustainable business development is among the main goals of the millennium development goals. In this realization it would be therefore critical for the government to be on the forefront in terms of policy formulation towards supporting food manufacturing firms. Support

can be through private public partnership such as the recently formed Kenya Cereal Enhancement Programme (KCEP) which will have a positive potential impact on food security and income generation for small scale farmers. Kenya Cereal Enhancement Programme (KCEP) is targeting three main cereals maize, sorghum and millet. The government should come up with such initiatives to support other food crops for food security and support of food manufacturing firms. Food manufacturing firms should also create supply chain departments that will be dealing with supply chain management risks and challenges as this will improve their performance.

### **5.3 Limitations of the study**

There are many limitations to the study particularly time constraints. During the period of data collection following up on respondents proved a challenge some of the respondents were difficult to follow up with their busy schedules.

This study focused on the food manufacturing firms only and focused on those located in greater Nairobi, the limitation is that the findings may not be applicable to other firms in other industries in Kenya because these findings are specific to the firms in the food manufacturing based in greater Nairobi. The findings may also not be applicable to companies out of Kenya.

The primary data collected by the likert scale may have biases of the respondent reflected in the results. This might therefore lead to results being dependent upon the attitudes of the respondent officers of the firms that responded. There is a possibility that if the respondents were different the results might be different.

#### **5.4 Suggestions for further Study**

This study can be repeated with a wider population of study across all food manufacturing firms in Kenya so as to get findings that are applicable to the food industry in Kenya. The study can also be conducted in other industries such as cement manufacturing, real estate industry since supply chain management risks and challenges affect all industries. There should be study to make the study applicable across time by conducting a time series cross-sectional study instead of the onetime study that was done by this census.

## REFERENCES

- Akal, Z. (1992), Performance Measurement and Control in Business, MPM, No. 473. Ankara.
- Awad, H.A.H., and Nassar, M. O., (2010) Supply chain integration: Definition and challenges. Proceedings of the international multiconference of engineers and computer scientists 2010 vol 1, Hong Kong.
- Bettis, R.A., Hall, W.K. (1982), "Accounting determined risk and accounting determined return", *Academy of Management Journal*, Vol. 25 No.2, pp.254-64.
- Blackman C., (2005) "A healthy future for Europe's food and drink sector?" *Foresight* vol. 7 No. 6 2005, pp. 8-23, Emerald Group Publishing Limited.
- Chopra S. and Meindl P., (2007) Supply chain management: strategy, planning, and operation, 3rd edition, Pearson, Prentice Hall.
- Chopra, S. and Sodhi, M., (2004) "Managing risk to avoid Supply chain breakdown" MIT Sloan management review, Vol. 46, No. 1: pp 53-61
- Christopher, M. (1998). Logistics and Supply Chain Management, Strategies for Reducing Cost and Improving Services (2<sup>nd</sup> ed.). UK: London
- Cooper, M.C., Lambert, D.M. and Pagh, J. (1997), 'Supply Chain Management: more than a new name for logistics,' *The International Journal of Logistics Management*, 8, (1): 1-14.
- Davis, E., Melnyk, S., Sandor, J. and Spekman, R. (2010) Outcome-Driven Supply Chains. MIT Sloan Management Review. Vol.51, no.2, pp. 33-38.
- Ellram, L. M. and Cooper, M. C. (1990), 'Supply chain management, partnerships, and the shipper-third-party relationship,' *The International Journal of Logistics Management*, 1, (2): 1-10.
- Enkvist, P.A., Naucler, T. and Oppenheim, J.M. (2008), "Business strategies for climate change", *McKinsey Quarterly*, No. 2, pp. 24-33.

- Food security report prepared by Kenya Agricultural Research Institute, 2008.
- Giles, M. (2014), "History of food manufacturing," knowledge peak- Delivering Excellence in Training and Consulting.
- Giunipero, L.C., Handfield, R.B. and Eltantawy, R. (2006), "Supply management's evolution: key skill sets for the supply manager of the future", *International Journal of Operations & Production Management*, Vol. 26 No. 7, pp. 822-844.
- Gehlhar, M. and Regmi, A. (2005), "Factors shaping global food markets", in Regmi, A. and Gehlhar, M. (Eds), *New Directions in Global Food Markets*, Economic Research Service, United States Department of Agriculture (USDA), Washington, DC, pp. 5-17.
- Ghoshal, S. (1987), "Global strategy: an organizing framework", *Strategic Management Journal*, Vol. 8 No.5, pp.425-40.
- Hardaker, J.B., Huirne, R.B.M., Anderson, J.R., Lien, G. (2004), *Coping with Risk in Agriculture*, 2nd ed., CABI Publishing, Wallingford, .
- Harwood, J., Heifner, R., Coble, K., Perry, J., Somwaru, A. (1999), *Managing Risk in Farming: Concepts, Research, and Analysis*, Market and Trade Economics Division and Resource Economics Division, Economic Research Service, US Department of Agriculture. Agricultural Economic Report No. 774,.
- Israel, Glenn D., (1992) *Sampling The Evidence Of Extension Program Impact. Program Evaluation and Organizational Development*, IFAS, University of Florida. PEOD-5, October.
- Kelly H., (2007) *Meeting the supply chain challenges*. (pp 68-71), New York: McGuffie
- Kenya national bureau of statistics (KNBS), (2009).
- Kenya Food Security Steering Group, (2008).
- Kim J.Y. (2014), "Food waste- a bigger problem than you thought", March 2014, President World Bank Group.

- Kleindorfer, P.R., Saad, G.H. (2005), "Managing disruption risks in supply chains", *Production and Operations Management*, Vol. 14 No.1, pp.53-68.
- Lee, H. and Whang, S., (2001) E-business and supply chain integration, Stanford University Global Supply Chain Management Forum, SGSCMF-W2 20 (pp 17-26)
- Leat P., and Revoredo-Giha C., (2013) "Risk and resilience in agri-food supply chains: the case of the ASDA PorkLink supply chain in Scotland", *Supply Chain Management: An International Journal*, Vol. 18 Iss: 2, pp.219 - 231
- Lambert, D. M. and Knemeyer, A.M. (2004), 'We're in this together,' *Harvard Business Review*, 82 (12): 114–122.
- Laudan R. (2010), "In Praise of Fast Food", *UTNE Reader*. "Where modern food became available, people grew taller and stronger and lived longer."
- Mandal, S. (2011), "Supply chain risk identification and elimination: a theoretical perspective", *The IUP Journal of Supply Chain Management*, Vol. VIII No.1, pp.68-86.
- Manuj, I. and Mentzer, J.T., (2008) "Global supply chain risk management strategies", *International Journal of Physical Distribution & Logistics Management*, Vol. 38 Iss: 3, pp.192 – 223.
- Meulenberg M. and Viaene J., (1998) *Changing Food Marketing Systems in western countries* Wageningen press, Wageningen pp 5-36.
- Mentzer, J.T., DeWitt, W., Keebler, J., Min, S., Nix, N., Smith, C., Zachariya, Z. (2001), "Defining supply chain management", *Journal of Business Logistics*, Vol. 22 No.2, pp.1-25.
- Miller, K. (1991), "A framework for integrated risk management in international business", *Journal of International Business Studies*, Vol. 23 No.2, pp.311-31.
- Moenga K. O., (2011), *Supply chain management practices and challenges for the small scale tea sector in Kenya*, Unpublished MBA research project University of Nairobi.

Mugenda, O.M. and A.G. Mugenda, (2003). *Research methods: Quantitative and qualitative Approaches*. Acts Press, Nairobi.

Munyui W.K., (2011), *Applications of inventory models in management of raw materials by food manufacturing firms in Kenya*, Unpublished MBA research project University of Nairobi.

Mwanda, C.O. (2000), Engineering Division, Ministry of Agriculture A note on weed control in Machakos District, Kenya.

Nag B., Han C., and Yao D. (2014) Mapping supply chain strategy: an industry analysis *Journal of Manufacturing Technology Management* Vol. 25 No. 3, 2014 pp. 351-370.

Organization for Economic Co-operation and Development (OECD) (2003), *Emerging Risks in the 21st Century – An Agenda for Action*, available at: [www.oecd.org/dataoecd/20/23/37944611.pdf](http://www.oecd.org/dataoecd/20/23/37944611.pdf) (accessed April 2014).

Parker, C. (2000), *Performance Measurement, Work Study*, No. 2, pp.63-66.

Prajogo D. and Sohal A. (2013), “Supply chain professionals: A study of competencies, use of technologies, and future challenges”, *International Journal of Operations & Production Management* Vol. 33 No. 11/12, 2013 pp. 1532-1554.

Richard P.J., Devinney T.M., Yip G.S., and Johnson G., (2009) *Measuring organizational Performance Towards: Methodological Best practice*, *Journal of management*.

Ritchie B., and Marshall D. (1993), *Business Risk Management*, Chapman & Hall, London,.

Shashank, T. and Thomas, J.G., (2009), "Supply chain risks: a review and typology", *The International Journal of Logistics Management*, Vol. 20 Iss: 1: pp. 97 - 123

Storey, J., Emberson, C., Godsell, J. and Harrison, A., (2006), "Supply chain management: theory, practice and future challenges", *International Journal of Operations & Production Management*, Vol. 26 Iss: 7 pp. 754 - 774

Sibbel A., (2012), Public nutrition and the role of the food industry *British Food Journal* Vol. 114 No. 6, 2012 pp. 784-797 Emerald Group Publishing Limited.

Schweikhardt, D.B. and Whipple, J.M. (2001), “Drivers of change”, in Outlaw, J.L. and Smith, E.G. (Eds), *The 2002 Farm Bill: Policy Options and Consequences*, Farm foundation, Oak Brook, IL.

Vashta J. W., (2012), Green supply chain management and supply chain responsiveness among food and beverages manufacturing firms in Nairobi, Kenya, Unpublished MBA research project, University of Nairobi.

Vickery, S. K. et al (2003) “The effects of an integrative Supply Chain Strategy on customer service and financial performance: an analysis of direct versus indirect relationships”, *Journal of operations and production management*, 21, 523-539.

Wassenhove, L.N. (2006), “Humanitarian aid logistics: supply chain management in high gear”, *Journal of the Operational Research Society*, Vol. 57 No. 5, pp. 475-89.

[www.jkuat.ac.ke/2014/01/multimillion-fast-food-manufacturing-plant-launched/](http://www.jkuat.ac.ke/2014/01/multimillion-fast-food-manufacturing-plant-launched/)Corporate Communications Office

<http://en.wikipedia.org/wiki/Nairobi> Wikipedia, 2014

[www.nairobimetro.go.ke](http://www.nairobimetro.go.ke) Nairobi metropolitan, 2014

[www.ams.usda.gov](http://www.ams.usda.gov) Agricultural Marketing Service, 2014

Yildiz, S. (2010), A research in banking sector on measurement of business performance, *Erciyes University Journal of Economics and Administrative Sciences*, 36, pp.179-193.

Zsidisin, G. A. & Ritchie, B. 2009. Supply Chain Risk Management- Developments, Issues and Challenges. *In: Zsidisin, G. A. & Ritchie, B (eds). Supply Chain Risk: A Handbook of Assessment, Management, and Performance*. Springer, New York, 1-12

## APPENDICES

### Appendix 1: Questionnaire

#### SECTION A: Organizational profile:

1. Name of the organization (optional).....
2. Type of the organization (please choose from the following)  
 Public       Private       International
3. The duration you have been in operations?  
 1-10 Yrs       11-20 Yrs       21-30 Yrs       31 Yrs and above
4. Do you have a supply chain management department?  
 Yes       No

#### SECTION B: Risks:

State the extent to which you agree with the following statements concerning the extent to which your organization faces the following risks. Use the scale of:

1= Strongly agree 2 = Agree 3 = Not sure 4 = Disagree 5 = Strongly disagree

Risks	1	2	3	4	5
Demand risks are more prominent in your organization					
Supply risks are more prevalent in your organization					
Operational risks are more common in your organization					
Security risks are common in your organization					

#### SECTION C: Challenges:

(i) State the extent to which you agree with the following statements concerning the extent to which your organization faces the following challenges. Use the scale of:

1= Strongly agree 2 = Agree 3 = Not sure 4 = Disagree 5 = Strongly disagree

<b>Challenges</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
The role of supply chain management in food manufacturing operations is yet to be recognized.					
Supply chain management is not given emphasis and integrated systems support					
Lack of capital investment commitments in supply chain activities					
There is a very high level of uncertainty in demand					
Lack of proper planning of supply chain management					
It is hard to coordinate and manage multiple players along the supply chain					
Poor infrastructure					
External complications due to foreign relations limiting cross border food exports and imports					
Lack of transparency of information and knowledge across the supply chain					
Lack of training programs on supply chain management operations					
Inadequate transportation modes present challenges in accessing surplus food producing areas					
Ambiguity of supply chain activities results in resource limitation, high uncertainties and thereby making it difficult to assess the uncoordinated commitments of stake holders					
Inability to anticipate shortages in raw materials for food manufacturing					
Accessing the geographical areas where food raw materials are found present challenges					



**SECTION D:** Effects of supply chain risks and challenges on service delivery on food manufacturing firms. (Tick one)

(i) State the extent to which you agree with the following statements concerning the effects of supply chain risks and challenges on food manufacturing firm's performance. Use the scale of: 1= Strongly agree 2 = Agree 3 = Not sure 4 = Disagree 5 = Strongly disagree

<b>Risks</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Supply risks affects the firm's ability to meet customer demand					
Demand risks affects customers willingness and ability to buy					
Security risks affects the firm's ability to meet customer needs					
Operations risks affects client satisfaction, reputation and shareholder value, all while increasing business volatility					
<b>Challenges</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Poor information integration affect delivery of product to right place					
Inaccessible locations may affect delivery at the right time					
Poor storage facilities affect the right condition and quality of the products					
Uncertainty in demand inhibits delivery of the right quantity					
Supplier failure may affect quantity delivered					
Poor infrastructure affects delivery of the right product.					
Lack of proper information affects delivery of the right product					
Poor operations may derail delivery of products at the right time					
Benefits of information and communication technologies may not be recognized thus affecting performance					

## Appendix 2: List of food manufacturing firms in Kenya

1. Africa spirits Ltd	2. Agriner Agriculture development Ltd	3. Agro chemical & food co. Ltd
4. All fruit EPZ Ltd	5. Al-mahra industries Ltd	6. Alpha fine foods Ltd
7. Alpine coolers Ltd	8. Amco foods Ltd	9. Annum trading co.Ltd
10. Aquamist Ltd	11. Arkay Industries Ltd	12. Atta (K) Ltd
13. Avenue fresh EPZ LTD	14. Belfast millers Ltd	15. Bidco oil refineries
16. Bio food products ltd	17. Breakfast cereals co. K Ltd	18. Broadway bakery Ltd
19. Brookside dairy Ltd	20. Bunda cakes and feeds Ltd	21. Buzeki Dairy Ltd
22. C.Czarnikow sugar (EA) Ltd	23. Cadbury Kenya Ltd	24. Candy Kenya Ltd
25. Capwell Industries Ltd	26. Carlton products (EA) Ltd	27. Centro food industries Ltd
28. Chai Trading Company Ltd	29. Chemelil Sugar co. Ltd	30. Chirag Kenya Ltd
31. Coast Salt works Ltd	32. Coastal Bottlers Ltd	33. Coca- Cola east Africa Ltd
34. Confec industries Ltd	35. Corn products Kenya Ltd	36. Crown Foods Ltd
37. Deepa industries Ltd	38. DelMonte Kenya Ltd	39. Dominion farms
40. E & A industries Ltd	41. East African breweries Ltd	42. East African sea food Ltd
43. Eastern produce kenya Ltd	44. Eldoret grains Ltd	45. Equator bottlers Ltd
46. Equatorial nut processors ltd	47. Erdemann Co. K. Ltd	48. Excel chemicals Ltd
49. Farmers choice Ltd	50. Farmyard Food Processors	51. Frigoken ltd
52. Giloil Co.Ltd	53. Githunguri Dairy Farmers C.S.Ltd (Fresha)	54. Glacier Products Ltd

55. Global allied Industries Ltd	56. Global beverages Ltd	57. Global Tea & commodities (K) Ltd
58. Gold Crown beverages (K) Ltd	59. Gold crown foods EPZ Ltd	60. Golden Biscuits (1985) Ltd
61. Happy cow Ltd	62. Highland canners Ltd	63. Highland nuts company limited
64. Highlands mineral water co. Ltd	65. Insta products (EPZ) Ltd	66. Jambo biscuits K.Ltd
67. James Finlay Kenya Ltd	68. Jetlak foods Ltd	69. Jungle Nuts Ltd
70. Kabianga Dairy Ltd	71. Kakuzi Ltd	72. Kamili Packers Ltd
73. Kapa oil refineries Ltd	74. Kapkoros Tea factory Co. Ltd	75. Karirana tea estate Ltd
76. Kenafric industries ltd	77. Kenblest Ltd	78. Kenchic Ltd
79. Kensalt Ltd	80. Kenshop S/Mkt (TI) Hot Bread Section	81. Kenya nut company
82. Kenya Orchards Ltd	83. Kenya Sweets Ltd	84. Kenya Tea packers Ltd (KETEPA)
85. Kenya wine agencies	86. Keroche industries Ltd	87. Kevian Kenya Ltd
88. Kibos sugar & allied industries	89. Kisii Bottlers ltd	90. Koba waters Ltd
91. Kwality candies and sweets Ltd	92. Lari dairies alliance Ltd	93. London distillers Ltd
94. Macadamia Springs International	95. Mafuko Industries	96. Manji food industries
97. Mayfair holdings Ltd	98. Melvin Marsh international	99. Menengai Oil Refineries Ltd
100. Mibisco Ltd-Nairobi	101. Milly fruit procesors Ltd	102. Mini bakeries (Nbi) Ltd
103. Miritini Kenya Ltd	104. Mombasa Cashew nuts Processors Ltd	105. Mombasa maize millers Ltd
106. Mt Kenya bottlers Ltd	107. Mumias Sugar Co.	108. Mzuri Sweets Ltd

109. Nairobi bottlers Ltd	110. Nairobi flour mills Ltd	111. Nairobi minerals water co.ltd
112. NAS airport services Ltd	113. Nesfoods industries Ltd	114. Nestle Kenya Ltd
115. New KCC Ltd	116. Nicola Farms Ltd	117. Njoro canning factory K.Ltd
118. Nyanza Biscuits Ltd	119.Palm house dairies ltd	120. Palmac Oil Refiners Ltd
121. Patco industries Ltd	122. Pearl industries Ltd	123. Pearly waters Ltd
124. Pembe flour mills Ltd	125. Premier Cookies Ltd	126. Premier flour mills ltd
127. Premier food industries Ltd	128. Proctor and Allan (EA) Ltd	129. Promasidor (Kenya) Ltd
130. Pwani Oil products Ltd	131. Rafiki millers Ltd	132. Razco Ltd
133. Re-Suns spices ltd	134. Riftvalley bottlers Ltd	135. Sameer agriculture and livestock K ltd
136. Sasini Tea and Coffee Co. Ltd	137. Sigma supplies Ltd	138. Softa Bottling co.Ltd
139. Spice world Ltd	140. Spin Knit Dairy Ltd	141. Stawi Foods and Fruits Ltd
142. Sunny Processors Ltd	143. Super bakery Ltd	144. Swan Industries Ltd
145. Swan millers Ltd	146. Tamu Tamu (K) Ltd	147.Tetra Pak East Africa dairy industry
148. Trufoods Ltd	149. UDV Kenya Ltd	150. Unga group
151. Usafi services Ltd	152. Uzuri foods Ltd	152. Valley bakery Ltd
153. Valley Orchards Kenya	154. Valuepak foods Ltd	155. W.E.Tilley(muthaiga) Ltd
156. Wanainchi marine products K. Ltd	157. West Kenya sugar co.Ltd	159. Williamson Tea
160. Wrigley company E.A.		

Source: Kenya Association of Manufacturers (KAM) directory (2013)

**Appendix 3: List of food manufacturing firms in Greater Nairobi.**

1. Africa spirits Ltd	2. Agriner Agriculture development Ltd	3. Al-mahra industries Ltd
4. Alpha fine foods Ltd	5. Alpine coolers Ltd	6. Annum trading co.Ltd
7. Aquamist Ltd	8. Avenue fresh EPZ LTD	9. Belfast millers Ltd
10. Bidco oil refineries	11. Bio food products ltd	12. Breakfast cereals co. K Ltd
13. Broadway bakery Ltd	14. Brookside dairy Ltd	15. C.Czarnikow sugar (EA) Ltd
16. Cadbury Kenya Ltd	17. Candy Kenya Ltd	18. Capwell Industries Ltd
19. Carlton products (EA) Ltd	20. Centro food industries Ltd	21. Chai Trading Company Ltd
22. Chirag Kenya Ltd	23. Coca- Cola east africa Ltd	24. Confec industries Ltd
25. Corn products Kenya Ltd	26. Crown Foods Ltd	27. Deepa industries Ltd
28. DelMonte Kenya Ltd	29. E & A industries Ltd	30. East African breweries Ltd
31. East African sea food Ltd	32. Eastern produce kenya Ltd	33. Equatorial nut processors ltd
34. Erdemann Co. K. Ltd	35. Excel chemicals Ltd	36. Farmers choice Ltd
37. Farmyard Food Processors	38. Frigoken ltd	39. Giloil Co.Ltd
40. Githunguri Dairy Farmers Co-Operative Society Ltd (Fresha	41. Glacier Products Ltd	42. Global allied Industries Ltd
43. Global beverages Ltd	44. Golden Biscuits (1985) Ltd	45. Highland canners Ltd
46. Insta products (EPZ) Ltd	47. Jambo biscuits K.Ltd	48. Jetlak foods Ltd
49. Jungle Nuts Ltd	50. Kakuzi Ltd	51. Kamili Packers Ltd
52. Kapa oil refineries Ltd	53. Karirana tea estate Ltd	54. Kenafic industries ltd

55. Kenblest Ltd	56. Kenchic Ltd	57. Kenya nut company
58. Kenya Orchards Ltd	59. Kenya Sweets Ltd	60. Kenya wine agencies
61. Kevian Kenya Ltd	62. Koba waters Ltd	63. Kwality candies and sweets Ltd
64. Lari dairies alliance Ltd	65. London distillers Ltd	66. Macadamia Springs International
67. Manji food industries	68. Melvin Marsh international	69. Mibisco Ltd-Nairobi
70. Mini bakeries (Nbi) Ltd	71. Miritini Kenya Ltd	72. Nairobi bottlers Ltd
73. Nairobi flour mills Ltd	74. Nairobi minerals water co.ltd	75. NAS airport services Ltd
76. Nestle Kenya Ltd	77. New KCC Ltd	78. Palm house dairies Ltd
79. Palmac Oil Refiners Ltd	80. Patco industries Ltd	81. Pearl industries Ltd
82. Pembe flour mills Ltd	83. Premier Cookies Ltd	84. Premier flour mills ltd
85. Premier food industries Ltd	86. Proctor and Allan (EA) Ltd	87. Promasidor (Kenya) Ltd
88. Rafiki millers Ltd	89. Razco Ltd	90. Re-Suns spices ltd
91. Sameer agriculture and livestock K ltd	92. Sasini Tea and Coffee Company Ltd	93. Sigma supplies Ltd
94. Softa Bottling co.Ltd	95. Spice world Ltd	96. Spin Knit Dairy Ltd
97. Stawi Foods and Fruits Ltd	98. Sunny Processors Ltd	99. Super bakery Ltd
100. Tamu Tamu (K) Ltd	101. Tetra Pak East Africa dairy industry	102. Trufoods Ltd
103. UDV Kenya Ltd	104. Unga group	105. Usafi services Ltd
106. Uzuri foods Ltd	107. Valuepak foods Ltd	108. W.E.Tilley(muthaiga) Ltd

Source: Kenya Association of Manufacturers (KAM) directory (2013)