EFFECT OF SUPPLY CHAIN MANAGEMENT PRACTICES ON PERFORMANCE OF FOOD PROCESSING FIRMS IN NAIROBI COUNTY, KENYA

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A Thesis Submitted to the Graduate School in Partial Fulfillment of the Requirements for the Award of the Degree of Master of Science in Procurement and Logistics Management of Chuka University.

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DECLARATION AND RECOMMENDATION

Declaration

This thesis is my original work and has not been submitted for an award of diploma or conferment of degree in any other University.

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Recommendation

This thesis has been examined, passed and submitted with our approval as the University Supervisors.

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DEDICATION

I dedicate this thesis to my parents; Stephen Mayabi, Joyce Mayabi, my brothers and sisters. May Almighty God abundantly bless you.

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ABSTRACT

. The productivity of food processing firms in Kenya has been declining due to the use Supply Chain Management Practices which are not current. The food processing subsector performance has also been declining thus its contribution to the Gross Domestic Product has reduced to 10% thus leading to operation inefficiency. Even though a lot has been done to curb the problem of poor performance in these firms the problem has continued to be experienced. Therefore, there is need for a study to be done on the Supply Chain Management Practices that could help enhance the performance of food processing firms. The overall objective of this study was to probe the effect of supply chain management practices on performance of food processing firms in Nairobi County. It was steered by the specific objectives pertinent to Supply Chain Management Practices namely; information sharing practices, logistics management and inventory management on performance of food processing firms in Nairobi County. Firm size was used as a moderator variable. The study was premised on the Complexity Theory in Logistics, The Lean theory and Grey system theory. Descriptive design was espoused. A population of 172 food processing firms and a sample size of 120 firms was determined. Stratified and simple random sampling were used to pick specific firms while data were collected using structured questionnaires. Descriptive statistics aided in describing the primary characteristics of the data. The Pearson Product Moment Correlation was used to establish the correlation between the studies constructs. Regression analysis aided to ascertain the effect of Supply Chain Management Practices on performance of food processing firms with the aid of SPSS version 28. T-statistics were used to gauge the significance of individual objectives at 5% confidence level while F-statistics was used to establish the overall significance of the model. The study established a positive significant effect between information sharing practices and performance (regression coefficient 0.247, p-value 0.029). Further logistics management was found to be positively correlated to performance, (regression coefficient 0.372, p-value of 0.000). Inventory management had a regression coefficient of 0.492 and a p-value of 0.000 indicating it is significant. The interaction between firm size and supply chain management practices had a regression coefficient of 0.257 and a p-value of 0.124 .It had a t-statics of 4.751. The study concluded that information sharing practices, logistics management and inventory management had substantial impact on performance on Food processing firms and recommends that food processing firms to apply information sharing practices and logistics management in order to reduce on cost. On the other hand, inventory management was found to be insignificant therefore it does not affect performance. Firm size was found not to alter the nexus between Supply Chain Management Practices and performance. The study recommends that firms should invest more in information sharing platform such as the EDI to enhance free flow of information. Food processing firms should incorporate the aspect of vehicle routing and vehicle scheduling to reduce the transportation cost. Further the study recommends that firms should establish adequate quality control and quality monitoring points in order to get the best quality during the production. The government to implement SCMPs and strategies that encourage businesses to espouse prudent management strategies regarding inventory to boost revenue. Further research should be conducted in different contexts and other studies should be carried out for a longer period of time to track the changes over a period of time.

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ABBREVIATIONS AND ACRONYMS

CRM	-	Customer Relationship Management
DOM	-	Distributed Order Management
EDI	-	Electronic Data Interchange
EOQ	-	Economic Order Quantity
EU	-	European Union
GDP	-	Gross Domestic Product
I/P	-	Inventory/Product
IT	-	Information Technology
JIT	-	Just in Time
KAM	-	Kenya Association of Manufacturers
KNBS	-	Kenya National Bureau of Statistics
MFs	-	Manufacturing Firms
NT	-	National Treasury
OE	-	Operating Expenses
PPMC	-	Pearson Product Moment Correlation
SC	-	Supply Chain
SCM	-	Supply Chain Management
SCMPs	-	Supply Chain Management Practices
SPSS	-	Statistical Package for Social Sciences
TP	-	Throughput
TCA	-	Transaction Cost Analysis
TCE	-	Transaction cost economics
TOC	-	Theory of Constraints
US	-	United States
VMI	-	Vendor Managed Inventory
CAS		Complexity Adaptive System
NACOSTI		National Commission of Science Technology and Inovation

CHAPTER ONE
INTRODUCTION

1.1 Background to the Study

Most of Manufacturing Firms (MFs) globally have enhanced their performance by looking into the manner in which they deliver products to their customers, and how they can speedily attend to the needs of the customers in a dynamic environment owing to increased competition, high quality requirements and more so, globalization. The manufacturers that aspire to remain afloat, enhance competitiveness and upscale their profitability in the rapidly changing global environment have to comprehend and put into practice the Supply Chain Management (SCM) (Cook *et al*., 2011). According to Ou *et al* (2016), and Ragu-Nathan and Rao (2016), the foregoing has not only contributed to SCM but also acknowledged it as a vital area that has spurred interest in among academicians and industrialists. The SCM encompasses planning implementing and controlling the operations of supply chain with the purpose of satisfying the customer requirements as competently as possible (Irina & Mihai, 2018). The various objectives of supply chain management include: enhancing productivity, reducing inventory, reducing lead times, growing market share and supply chain integration.

The rationale of supply chain practices is to handle complex supply chain with the aim of integrating only all activities of production and distribution that add value to deliver client requirements (Evans *et al.,* 2017). SCM is deliberated as a field that has been studied across several disciplines from a variety of angles and perspectives (Papa Kiriakopoulos & Pramatari, 2018). The SCM practices are projected to be a multi-dimensional concept that encompasses both the upstream and the downstream phases of the supply chain. While SCM concept involves buying and supply management, these two views underscore the procuring and managing materials as the primary strategic business process rather than a specific supportive role as postulated by Melnyk, *et al* (2014), transportation and management of logistics functions. Further, it addresses combined logistics systems that involve delivery of services, transport, management of inventory, and vendor relationships that all that result in reduction in inventory in firms along the supply chain (Cook *et al.*, 2011).

Supply chain management practices (SCMPs) have turned into more significant factor for poorly-performing firms to remain competitive in the global race (Okongwu *et al.*, 2015). The nature of SCMPs will be able to explain the double purpose of SCM as it improves the performance of an individual firm as well as the performance of the whole supply chain. According to (Choy, 2012) he states that supply chain management practices contributes to about 50% to the better performance of any organization. This could be achieved through the effective adoption and construction of the SCM practices (Kim, 2016). However, some of the firms, apart from few do not comprehend what SCM practices to implement and what entails complete set of SCMPs (Li *et al*., 2006). Supply chain management practices can absolutely affect performance of an organization (Tan, 2020). In developing countries, firms have stepped up their consideration of SCM, however, they still lag behind. Certainly, (Moh'd Anwer., *et al* 2018). points out national entrepreneurs and industrial conglomerate managers disregard the theme of SCM in developing countries. Due to this phenomenon, the manufacturing sector in these countries is unable to embrace and develop the procedures necessary for efficient management of their supply chains.

The SCMPs are executed to attain and improve performance by allowing an internal cross-functional integration within the firm, and external integration with suppliers and customers (Kannnan & Tan, 2010; Kim, 2016). These practices are regarded key, and they cover upstream and downstream sides of the supply chain (SC). Alvarado and Kotzab (2001), emphasizes the importance of interorganisational system such as Electronic Data Interchange (EDI), concentration on core competences and eliminating excess inventory levels in supply chain management practices. Tan (2002), also agrees that a seamless supply chain includes information sharing, managing materials and supplies and customer service. Cheng and Paulraj (2015), adds that SCMPs includes long term customer and supplier relationship, process integration, inventory management and order postponement. Therefore, the authors affirm that SCMPs need to cover relationships management, communication, supplies management, supplier involvement, logistical management and strategic location. Though the relationship between SCM practices and performance is well understood in the present literature, little is known about how these practices of high-performing organizations affect their performance.

The present study focuses on three SCM practices in firms these are; information sharing practices, logistics management and inventory management. The study focuses on the three variables as they have not been investigated in depth in the context of food processing firms. The variables: partnership, global sourcing, supplier relationship management, order postponement, e-sourcing, green procurement customer relationship and e-procurement identified in other contexts by previous researchers such as Li *et al*. (2006), Green *et al*., (2015), Tan (2020) and Cook *et al*. (2011), are important in the agricultural commodity supply chain.

Information sharing practices entails the informal and formally agreed methods of disseminating relevant information within the supply chain by the actors to improve collaboration within logistics management, Wardaya (2013). The fruitful incorporation of information in an enterprise is a robust driver for reducing expenses, enhancing productivity and improving client service Information. Indeed, Kazi (2012) notes that sharing information is one of the five cornerstones of a robust supply chain relationship. Further, the author maintains that knowing the data needs of the organization and having a strong information sharing policy in within the organization increases the competitive advantage of the firm. High level of information sharing within the SCM improves the success of supply chain and contributed to better performance of organizations. Marinagi *et al*., (2015) established that information sharing among entities or parties across the supply chain and having a proper integrated information system facilitates higher overall performance. Khalil *et al*., (2019) found that information sharing quality had a negative influence on organizational productivity. However, the above studies did not reflect on information exchange policy, integrated information and data needs.

Zhang *et al.* (2015) surveyed the influence of logistics flexibility on the level of customer satisfaction in manufacturing firms. They established that increase logistics flexibility, enabling speedier restocking of raw materials and quick delivery of completed items to clients, in order to increase customer satisfaction. The study however did not exam other aspects of logistics management. Logistics management primarily comprises of strategically managing how materials are stored or moved, how procurement is done, how finished inventory is managed including information

movement through the organization and its marketing avenues in a manner that present and future profitability are optimized through cost- effective fulfillment of orders (Stough, 2017). It involves logistics design and vehicle management approaches such as vehicle routing and vehicle scheduling that aid to monitor logistics costs and escalate the level of customer service. However, there is inadequate empirical studies on logistics management in food processing firms in Kenya. Hence, little is known about the effects of their logistics design, vehicle routing and scheduling on their overall performance.

Organizations utilize inventory management strategies boost the efficiency of their supply chains. Mwangi (2013) addressed management of inventory and SCM while focusing on non-state organizations in Kenya. The study established that inventory management had a positive effect on performance. However, the study did not determine the effect it had on food processing firms. Tong *et al.,* (2019), inventory management entails organizations managing the effective and efficient acquisition, storage, packaging, receipt and distributing goods to meet organization's demand levels. Various studies have been done on the bearing of inventory management techniques on productivity of various organizations in different contexts. These studies were guided with variables such as vendor management inventory, lead times, just in time, ABC analysis and stock levels control. However, the studies have not explicitly revealed how inventory management practices such as; Stock levels control, Reorder level and Quality Control affect the performance of food processing firms.

Richard *et al.,* (2019) noted that enterprise performance encompasses three specific areas that include financial and market performance of products and procurement performance. The financial includes aspects such as net returns, asset return and returns on money invested. While product performance involves elements such as market share, procurement performance includes lead times, customer satisfaction and operation efficiency. With regard to the present study, which is concerned with the supply chain, one measure of organizational performance from Richard *et al.,* (2019) will be used, that is, operation efficiency. Operation efficiency is an important supply chain performance measurement as it shows how an organization ought to reduce redundancy, reduce cost and wastage while optimizing the resource that account most

to its success and using top-notch businesses activities, technology and manpower (Pham, X. K. (2017).

The size of the firm may be a sign that it is expanding, which mean that the market will respond favorably. Therefore, firm size has been used variously in extant studies as a moderating variable rather than as an explanatory variable to account for the differences in the scale of operations of the firms. However, there have been limited mixed findings on the moderating effect of company size on performance which are mostly attributed to the measurement of the performance construct. For example, Younis and Sundarakani (2020) found positive regulating effect of enterprise size between other firm independent variables and economic performance, social performance and not with operational performance. There is no universally used definition of what constitutes a large, medium and a small firm. For the interest of the study, small manufacturing firms can be defined as per the sessional paper number 2 of 1992 and the national baseline survey of 1999 which categorizes manufacturing firms in Kenya as small l (10-49) employees, medium (50-99) and large firms (above 100) employees. Therefore, firm size can be used as a moderator to assess SCMPs against firm performance.

One of the growing business issues of the twenty-first century is optimization of the supply chains to convey goods or services to clientele in an effective manner (Kirovska *et al*., 2016). Over the course of seven years between 2010 and 2017, the total inventory in the supply chain increased slowly in the United States manufacturing enterprises (U.S. Census Bureau News, 2017). As a result, supply chain supervisors have a chance to employ SCM techniques to exercise better managing of inventory. Spurred by the emergence of establishments like Amazon that complete and convey online customer orders in a short time-span after order placement, customer anticipations for quick order completion continue to rise (Yao, 2017).

In China, proper selection, evaluation and management of supplier relationships help to reduce conflict, opportunistic behavior, and transaction and inventory costs, while also enhancing quality, delivery, flexibility, customer service and innovative capabilities. All of this would go a long way toward helping Chinese firms gain a

competitive advantage in the marketplace and improve financial performance (Liu & Mckinnon, 2016). However, most of these firms as compared to the Western firms are not so advanced in SCMP. Tan (1995 cited in Chen *et el*., 2019), for instance, reported significant communication between firms and their customers and suppliers–but the nature of the communication was often limited to the downstream side. They note that firms that communicate with customers tend to do so with suppliers as well (Vollmann *et al.,* 2015).

The majority of Indian businesses have streamlined their supply chain goals to align with their corporate intentions. However, majority of them are unable to fully benefit from their potential owing to different aberrations and diseconomies of scale or scope. There is an upsurge in customer and end-consumer in respect of increased product availability, responsiveness and client reach. Concepts such as Customer Relationship Management (CRM) are being tested and experimented. For certain firms, businesses have a good facility network design and higher levels of collaboration and partnerships in the supply chain's upstream and downstream are particularly noticeable (Srivastava, 2022).

Supply chain management is core to the financial management of the public sector in South Africa. According to Ambe and Maleka (2016) citing the South Africa's National Treasury, the conception of SCM was adopted in 2003 as a result of flaws in the processes and procedures in public procurement. Notwithstanding the reforms in the use of supply chain management in public sector of South Africa, there have been problems with supply chain management practices particularly in municipalities. Indeed, the adoption of SCM practices and policies is still a challenge (Malhan *et al*., 2015). However, in the manufacturing sector, Peristeris *et al.* (2015) found that case study organizations SCM techniques adhered closely to those described in SCM framework.

Manufacturing firms are the backbone of economic progress for countries by promoting industrial expansion. They contribute significantly to economies by fostering job prospects and anchoring large industries (Anuar & Yusuf, 2016). To sustain these contributions, manufacturing firms ought to embrace top-notch SCMPs in addition to

advancing their technology and manufacturing processes. Sandhu, Helo and Kristiano, (2013) opine that SCM practices in a company are seen as operational activities and central business operations, that affect how effective and efficient the supply chain is. The major intention of SCM is to improve supply chains and firm performance competitiveness in the long-run through integration with partners, of activities, operations and processes both internally and externally. The partners are clients, industrialists, manufacturers, distributors and suppliers (Kim, 2016). SCM includes a variety of activities for instance all logistic management functions with partners, outsourcing, coordination, planning and procurement (Soosay, Hyland & Ferrer, 2018). Existing studies underscore that the definitive aim of SCM is to boost the productivity of firms (Li *et al.*, 2014, 2006; Chen & Paulraj, 2016; Min and Mentzer, 2014).

Kenya is an emerging economy that is averagely industrialized with a robust manufacturing sector in the African Continent (KAM, 2014). The Kenyan economy benefits greatly from the food processing industry. Food and beverage processing firms in Kenya are categorized under the manufacturing industry. The industry contributes for close to 10 percent of GDP, with the majority of goods, approximately, 95% being food and beverages, building materials and basic chemicals (KIPPRA, 2018).

The Kenya Association of Manufacturers (2018) establishes that agricultural produce processing enterprises are the biggest contributor in regard to volume of production and employment in industrial and allied sector in the country. Agricultural firms therefore have the ability to boost economic growth by supplying raw materials and market for produce in bulk as well as acting as catalysts for expanded farm produce production. The segment is a key prolific sector of the economy projected to back the achievement of Vision 2030 due to its immense potential in poverty eradication, job creation and wealth establishment. In Kenya, food and beverage processing segment is a relatively well-developed sector with products ranging from dairy products, canned vegetables, bakery products, sugar and confectionary, fish, oil and fats among many other products (Kariuki, 2016).

Food and beverage processing firms in Nairobi vary from small-family-informal firms to large formal enterprises quoted in the Nairobi Securities Exchange. Others include

subsidiaries of foreign and multinational companies. Multinational food and beverage processing firms have established operations in Kenya either as foreign companies or as joint ventures (Muteshi *et al*., 2017). The performance of food processing firms in Nairobi County has been declining, according to the World Bank report due to the unstable operating climate thus declining profitability over the past five years (World Bank, 2020). The subsector performance has also been declining as compared to other sectors for example according to the (KNBS, 2015) the agriculture output increased by 15.8%, building and construction increased by 13,1%, transport and storage increased by 13.7% while the input of food processing companies to GDP reduced from 15% to 10%. thus leading to operation inefficiency. According to hanse (2020),the current food production in the food processing firms does not meet the demand thus leading to uncertainty of the sector to meet one of the big four agendas in the county which is food security.

1.2 Statement of the Problem

Food processing firms have shown low performance trends in terms of productivity and effective operation ,according to Kenya association of manufacturers, hence raising uncertainty on the capacity of the sector to drive to vision 2030 and the big four agendas of the country. The subsector performance has also been declining as compared to other sectors thus its contribution to the GDP reduced from 15% to 10%. thus leading to operation inefficiency. This has seen the closure of some of the food processing firms for example, Mumias sugar factory, Pecha Food Limited, Stawi Food and Fruits Limited, Maz International Limited and Kuguro Foods Complex Limited. One of the strategy of improving the performance of this sector is resorting to SCMPs as they account to about 50% of profitability and better productivity of any enterprise. This has been subject to various studies done by different scholars who studied various aspects of SCMPs on performance of manufacturing firms and other sectors among them strategic supplier partnership, client, supplier relationship management outsourcing and electronic procurement. However, the studies did not examine the influence of other SCMPs such as information sharing practices, logistics management and inventory management. The above studies did not determine the moderating effect of firm size on the performance of food processing firms. Therefore, these calls for research to be done on the SCMPs that help improve the performance of food processing companies. Thus

the current study sought to determine how Supply chain management practices affect the performance of food processing firms in Nairobi County, and the moderating effect of firm size on the relationship between food processing firm performance and SCMPs in Nairobi County.

1.3 Objectives of the Study

1.3.1 General Objective

The main goal of this study was to determine the effect of supply chain management practices on performance of firms that process food in Nairobi County, Kenya.

1.3.2 Specific Objectives

i. To assess the effect of information sharing practices on performance of food processing firms in Nairobi County
ii. To determine the effect of logistics management on performance of food processing firms in Nairobi County
iii. To determine the effect of inventory management on the performance of food processing firms in Nairobi County.
iv. To determine the moderating effect of firm size on the relationship between supply chain management practices and performance of food processing firms in Nairobi County
v. To assess the joint effect of information sharing practices, logistics management and inventory management and the performance of food processing firms in Nairobi county

1.4 Hypotheses

$H0_1$: There is no statistically significant relationship between information sharing practices and performance of food processing firms in Nairobi County

$H0_2$: There is no statistically significant relationship between logistics management and performance of food processing firms in Nairobi County

$H0_3$: There is no statistically significant relationship between inventory management and performance of food processing firms in Nairobi County

$H0_4$: There is no statistically significant moderating effect of firm size on the relationship between supply chain management practices and performance of food processing firms in Nairobi County.

$H0_5$: There is no statistically joint relationship between information sharing practices, logistics management and inventory management and performance of food processing firms in Nairobi County.

1.5 Significance of the Study

The government can use the findings of this study to ensure the development and successful implementation of supply chain management practices in order to meet the performance target in the food processing firms as well as ensuring that guidelines and procedures are well instituted to improve the performance of food processing firms. To the academia, the study will also add into the body of knowledge through providing both theoretical insights and empirical evidence on Supply chain management practices resulting into research materials for researchers in the subject matter. The study could be of significance to diverse stakeholders in the industry including the management of firms that process food in Nairobi and the entire country, the Kenya Association of Manufacturers, the Supply Chain fraternity, policy makers in government and the academia. The study will exemplify the practices within the industry in regards to management of supply chain and any challenges in implementation of practices and the resulting competitiveness so as to enable the food processing firms' management draw important practice lessons from the study that they can use for reference. The effect of the study is also anticipated to enrich the understanding of the stakeholders such as the Kenya Association of Manufacturers who in turn can lobby for change in policies in relation to restructuring of the sector on a need basis. In this context, the KAM in conjunction with the Ministry of Industrialization can help formulate policies that would enable prudent practices in regard to management of supply chain that will not hurt competitiveness of the sector.

1.6 Scope of the Study

The present study addresses only the effect of supply chain management practices on performance of food processing firms in Nairobi County, Kenya. The independent variables pertinent to SCMPs were; information sharing practices, logistics

management and inventory management while the dependent variable was the performance. The population on focus was 172 food processing firms in Nairobi County, where a sample size of 120 firms was obtained. Firm size was used to moderate the association between the dependent, and the independent variables. The study was carried out between 2021-2022.

1.7 Limitations of the Study

The limitations anticipated were the challenges of cooperation from the respondents. This was overcome by explaining the need for the study and its nature. Therefore, assurance of respondents' confidentiality was done. The study was also limited to a onetime data collection thus it did not give a chance to track the changes over a longer period of time.

1.8 Assumptions of the Study

The study also assumed that all the responses that were obtained from the respondents was a true reflection of the situation and hence be valid for the study purposes. It also assumed normality of the data, independence of the data and heteroscedasticity of variance of the data.

1.9 Operation Definition of Terms

Food Processing Firm: they are organizations that that are involved on sale and use of products in food and beverage grouping. They convert various raw materials both from plants and animals into finished good that are consumed as end products.

Information Sharing Practices: these are the informal and formally agreed methods of disseminating relevant information within the supply chain by the actors to improve collaboration within logistics management

Inventory Management: is a process or procedure through which businesses control and oversee the purchase, receipt, storage, packaging and issuing of goods and components that satisfy the demand levels of the organization in an effective and efficient manner

Lead Time: Lead time is an important supply chain performance measurement as it shows the time advantage a form has in the supply chain as a measure of efficiency

Logistics Management: This is advantageously managing the procurement, movement and storage of materials, parts and finished inventory (and the related information flows) through the organization and its marketing channels in such a way that current and future profitability are maximized through the cost- effective fulfillment of orders. It involves logistics design and vehicle management approaches that help to control logistics costs and increase customer service level.

Manufacturing Firm: is any company that produces finished goods by assembling parts and components, and raw materials.

Operation Efficiency: Operation efficiency is also an important supply chain performance measurement as it shows how an organization needs to minimize redundancy and wastage while leveraging the resource that contribute most to its success and utilizing best of its workforce, technology and business processes

Performance: is a specific outcome from economics, management and marketing that gives traits of competitiveness, efficiency,

and effectiveness to ta firm, and its structural and procedural elements.

Supply Chain Management Practices - are comprehensive collection of practices used by a firm to improve its internal supply chain.

CHAPTER TWO
LITERATURE REVIEW

2.1 Review of Empirical Literature

2.1.1Supply Chain Management Practices and performance

According to Adebayo (2012), supply chain management practices (SCMP) is a set of activities undertaken in an organization to promote effective management of its supply chain. Kim (2006) define SCMP as an inclusive set of actions which are employed in an organization in order to enhance its internal supply chain. Some of the variables of SCMP include strategic supplier partnership, information sharing and postponement. Consequently, the study adopts the definition of SCMP by Kim (2006) owing to the concept of inclusive practices and enhancement of the supply chain. Supply chain management practices impact not only overall organizational performance, but also competitive advantage of an organization (Karimi & Rafiee, 2014).

Li et al. (2005) attempts to develop and validate a measurement instrument for SCMPs. Their instrument has six empirical validated and reliable dimensions, which include strategic supplier partnership, customer relationship, information sharing, information quality, internal lean practices and postponement. A study by Koh (2007) on the impact of supply chain management practices on performance of SMEs used survey instrument to investigate the impact of SCMPs on performance of SMEs. SMEs performance was measured using two variables i.e. the operation performance and the SCM-related performance. The study concluded that there was a strong correlation between SCMPs and performance of SMEs. Hussein (2014) similarly, investigated the effects of supply chain management practices organization performance in consumer food manufacturing industry of Pakistan, quota sampling method was used and 4 questionnaires were given to each industry to get unbiased results from four organization departments. The total population of the study was 331 supply chain managers and 81 employees.

Hussein (2014) unlike Koh (2007) concluded that SCMPs in Pakistan are not much practiced as the results depicted that strategic supplier partnership is positively impacting on the performance while level of information sharing and postponement are negatively correlated to supply chain management practices due to cultural and

environmental circumstances and nature of the practice. Therefore, the current study sees to bridge the gap by using information sharing, inventory management and logistics design as the independent variable and use operation efficiency as the measurement of performance.

Sukati *et al*. (2011), carried out a research on the relationship between supply chain management practices and the competitive advantage of a firm in Malaysia Manufacturing industries. The study was guided by the following SCMPS: Supplier partnership, customer relationship management and information sharing. The sample size comprised of 200 supply chain practitioners. Descriptive research design was used and data collection was done using structured questionnaire. The study showed that there was a positive relationship between supply chain management practices and the competitive advantage of the firm. The study, however, lacked a moderating variable and, therefore, not moderating effect on performance of firms was established. The present study will use firm size as a moderator variable.

Vincensia Anyango Apopa (2018) studied influence of supply chain management practices on performance of government ministries in Kenya. The specific objectives were to establish the influence of supplier section practices, supply chain policies, supplier collaboration practices and risk management on the performance of government ministries in Kenya and to evaluate the moderating effect pf organizational culture on the relationship between SCMPs and the performance of government ministries. The study adopted cross-sectional study design and the unit of analysis for the study was 20 government ministries with a target population of 1372 supply chain management employees. Both primary and secondary data was collected and stratified random sampling was used to get the required sample size. The findings revealed that there was a positive association between SCMPs and performance of the government ministries. The findings also revealed that SCMPs can explain 94.6%of performance while introducing organization culture in the model increases the R- square to 98% meaning the model is a good fit. The study, however, focused on the public sector organizations where the SCMP could be different from the private sector. The current study will bridge the gap by using information sharing, logistics design and inventory management to determine the effect they have on performance of food processing firms.

2.1.2 Information Sharing Practices and Performance

A study on information exchange and performance of supply chain by Fawcett *et al* (2008) employed survey and partially-structured interviews in data pooling. They carried out the study in 124 manufacturing firms and used simple random sampling to obtain a sample size. The results exhibited that most firms typically do not benefit fully from information exchange because they frequently place much effort on connectivity and too little on willingness. Additionally, establishing connectivity right is a serious barrier that most businesses encounter in their attempt to boost performance. Integrating willingness and connectivity seem to enhance performance. When connectivity and willingness were put together they seem to be an effective tool that improves the performance of the organization. A study by Ristovska *et al*. (2017) in Macedonia on the effects of information exchange practices on performance of textile firms used a sample size of 36 textile firms. Data were pooled using questionnaire and analysis done with the aid of SPSS 22.t-test was used to determine the significance of each specific variable while f-test was used to determine the significance of the overall model. Multiple linear regression model was used to determine the relationship between the dependent and the independent variable. The researchers found that the relevance, timeliness and accuracy of information within and outside the company make it possible to achieve opportune and timely decision making.

Both Fawcett, (2007) and Ristovska *et al*, (2017) held that general information sharing positively affects the performance. The preciseness of data prevents making erroneous decisions and incurring pointless costs, and if the information is prioritized, then data processing time will be reduced and enable make critical decisions more rapidly. Fawcett (2007) and Ristovska *et al*. (2017) support Hübner, (2016) that electronic databases offer access to information whenever it is needed and the possibility for use over temporal and spatial distance when making crucial timely decisions and thus cause a decrease in lead time which will make the firm to meet its operation efficiency through complete management of information, pertinent data selection and monitoring, speedy transmission and apposite use of information thus increasing its success. However, both studies were based on supply chain performance while the current study will be based on operation performance.

Sharing information across supply chain partners permits them to synchronize their operations and streamline supplier-client relations. Since patented and private information is usually shared along the supply chain, maintaining the integrity of the shared information is an important concern. Against this background, Marinagi *et al*., (2015) examined the intervening role of information exchange on information quality and supply chain performance. A structured questionnaire was used in the field study comprising of a cross-sectional sample of firms in Central Greece. The sample consisted of 200 manufacturing SMEs obtained from ICAP database with 10 to 250 employees. The outcome reaffirmed and supported the mediating function of information exchange in Greece. The findings implied to managers that information exchange in the supply chain allows improved general performance occasioned by implementation of supply chain management principles that raise the dependability and quality of information. The current study bridges the gap by using information sharing practices as an independent variable to assess its effect on performance

Previous studies on SCM advocate that information sharing appears to be a substantial source of competitive edge. Koçoğlu *et al*., (2017) investigated the effect of supply chain integration on information exchange and enhancing performance of supply chain. The hypotheses were verified using data from 158 in top 500 Turkish Manufacturing companies manufacturing companies in Turkey that are listed Istanbul Chamber of Commerce. The results suggested that supply chain integration (SCI) which strengthens connectivity, collaboration and coordination among SC members performs a crucial role in information sharing process. In addition, findings offered helpful intuitions on how firms might use information exchange to boost the efficiency of their supply chains. The current study will bridge the gap by using food processing firms in Nairobi County, Kenya.

In Ghana, Baah *et al*., (2021) investigated how information exchange in supply chains affected organization performance by studying the functions of supply chain agility, collaboration and visibility. A descriptive research design and quantitative approach were used by the study. Furthermore, the partial least square structural equation modeling (PLS-SEM) was adopted in data analysis and interpretation owing to its potential in predictive research models. The results show that information exchange

considerably and favorably affected the visibility, performance and agility of supply chain. While visibility of the supply chain had a substantial impact of performance, collaboration and agility largely influenced performance of the supply chain. The study outcomes underscored that information exchange is chief to boosting competitive gains and robust supply chain performance. The current study will employ descriptive research design and used of multiple regression model

Studies on information sharing practices, and performance of supply chain have also been carried out in Kenya, though to a limited extent. Kimitei *et al*., (2015) sought to investigate how information sharing affected the association between performance and supply chain linkages among Nairobi County's flower companies. The study used the an explanatory research methodology and data gathered using a census approach on target population of procurement staff members of 34 flower farms that are under the registration of Kenya Flower Council in the County of Nairobi. Data was collected using structured questionnaires, and data analysis also included the application of descriptive and inferential statistics. Pearson correlation was utilized to gauge correlation of variables whilst multiple regression model was espoused to analyze data to test the hypotheses. The study concluded that information exchange to a large extent moderated the link between performance and client linkages, supplier linkage and performance, and performance with internal linkages. The current study will use stratifies sampling, simple random sampling and use questioners for data collection.

Nyagah *et al* (2015) studied e-procurement and performance of supply chain while focusing on New KCC in the dairy sector in Kenya. Descriptive design was espoused. The study established that a positive association between e-procurement measured as ERP, electronic order processing, information exchange and e-supplier evaluation and supply chain performance. Similarly, Mutangili (2019) performed a study on e-procurement practices and performance of supply chain focusing on Kenya Airways. The study employed a desk-study review method where existing empirical studies on e-procurement were reviewed and results related to the airline industry. The study established that information sharing together with, e-order processing, and e- supplier evaluation largely impacted supply chain performance. It was also determined that the correctness of data is raised by the electronic transfer of procurement information

leading to better decision making process. Furthermore, having access to correct data that improves customer relations is vital for management of enterprises that need to promptly respond to client demands. This study filled the gap by determining how data need and integrated information affects the performance of food processing firms.

Wairingu Joseph (2015), sought to establish the effects of information sharing on supply chain performance of manufacturing firms in. Nairobi County, Kenya. A descriptive research design was adopted for the purpose of assessing the research's general intent. The research's target population constituted 463 Nairobi County based manufacturing firms. A sample of 100 firms was chosen using proportionate stratified random sampling. Primary data was collected using questionnaires which were administered through drop and pick later method. Data collected was analyzed using descriptive and inferential statistics. Statistical package for social sciences was used to aid in data analysis. The findings were presented using figures and tables. The research found out that sales information sharing, order information sharing, sharing delivery information and customer and supplier firm relationships affected supply chain performance in the Nairobi County, Kenya manufacturing firms to a great extent.

The independent variables relationship with supply chain performance was positive from the regression analysis. The research established that information sharing enabled manufacturing firms establish market trades which enabled prior planning for on-time delivery and speed of response. Further deductions were that through sharing of order information, firms were kept updated with changes in purchase order and this facilitated the developments of highly precise and reliable order plan which results to reduction in costs of supply chain. The researcher recommends that the management of the manufacturing firms should put in place more sales information sharing procedures and technologies in order to beef up the sharing levelThe current study aims to bridge the above gaps by carrying out the study in different context, (food processing firms in Nairobi county), using different dimensions (information sharing policy, integrated information system and data need) to determine how they affect the performance of food processing firms.

2.1.3 Logistics Management and Performance.

Zhang *et al.* (2015) surveyed the influence of logistics flexibility on the level of customer satisfaction in manufacturing firms in China. A total of 273 manufacturing firms were considered. Data was collected by the use of questionnaires. Descriptive research design was used. The findings showed that logistics flexibility has affirmatively and substantially impacted customer satisfaction. This demonstrates that businesses can increase logistics flexibility, enabling speedier restocking of raw materials and quick delivery of completed items to clients, in order to increase customer satisfaction (Zhang *et al,* 2005). Similarly, Zhao *et al.,* (2018) carried out a study on logistics management activities and firm performance resolved that logistics proficiencies relating to customers and information were the uppermost tenets that affected directly and indirectly the performance of a firm. Both Zhang *et al.* (2015) and Zhao *et al*. (2018) agree that customer satisfaction is important in the logistics system and that logistics flexibility was important in meeting this objective. However, the study by Zhao *et al.* (2018) was biased towards competencies and not considering other factors such as efficiency and effectiveness in logistics that might affect a firm. In Zhang's *et al.* (2015) study, the relationship between logistics flexibility and the firm performance dimension was not fully addressed. Therefore, the current study will bridge the gap by using logistics management dimensions such as vehicle routing, vehicle scheduling and logistics design to make certain the effect they have on performance of firms that process food in the County of Nairobi.

Fleischmann (2013) examined reverse logistics network structures and design through a systematic empirical review. The study encompassed in 94 logistical firms in Nairobi county. The research design used was descriptive, and a complete enumeration survey done to pool data in all logistical firms. Data were analyzed using SPSS version 26 and the study found that when it comes to network organization, the necessary requirement for grading and testing ought to involve a specific centralization vs decentralization tradeoff. What differentiates this circumstance is that good flow can only be attributed to a certain destination after testing. Consequently, testing and grading near to the source could lower the transportation costs, especially by distinguishing scrap from precious resources through separating. On the same vein, costs associated with investment for test equipment may necessitate a centralized function. Second,

unpredictability on the supply side that reverse logistics network design must deal with is a crucial aspect. Used products form a supply source that is far more erratic and difficult to manage in terms of timing, quality and quantity than traditional 'virgin' resources. As a consequence, reverse logistics networks must be resilient to changes in flow volumes and composition. The current study will bridge the gap by examining how logistics design can be used to mitigate logistical costs.

Sezen (2018) looked at the comparative effects of logistics design, logistics integration and information sharing on supply chain performance. Data were gathered from 125 manufacturing firms in Turkey. The relative effect of predictor factors namely, integration, information exchange and design on flexibility, resource and output productivity of supply chain were asses using regression analysis. The data were collected using structured questionnaire. Regression results depicted that supply chain design had the only real substantial impact of resource and output performance. Integration and information exchange are associated with performance measures, though comparatively, supply chain design has a larger relative effect. The present study bridges the gap by using predictor variables such as vehicle routing, vehicle scheduling to determine their effect on performance of food processing firms

Nyaberi and Mwangangi (2014), examined how organization performance was affected by logistics management practices in Rift Valley Bottlers Limited in Uasin Gishu County, Kenya. A case study design was used targeting 80 employees who were selected using stratified sampling method. Questionnaires and interviews were employed to gather data. Descriptive statistics such as factor analysis and weighted averages aided in data analysis. The findings revealed that logistics management cannot be wished away and businesses ought to coin order processing techniques to raise performance. It is essential to create appropriate logistics management practices in tandem with the organizations' operations and line of production because transport logistics management is a bigger part of logistics management and ought to be constituted in all parts of purchasing. The current study bridges the gap by carrying out the study in a different context, food processing firms in Nairobi county.

A study by Ngonela *et al*. (2014) addressed logistics outsourcing and n tea processing firms in Bomet county. The author discovered that logistics outsourcing reduces cost, enable the company to concentrate on the core businesses, reduces risk and gains a competitive advantage. The research further established that tea processing firms owned fleet of trucks for transportation instead of outsourcing but the research did not explore how we can design our logistical system to ensure that there is customer satisfaction but as we consider the cost effectiveness. Mwangangi (2016) delved into influence of logistics management on firm performance of manufacturing firms in Kenya. The study used descriptive and exploratory research design. The target population were the manufacturing firms. The study came to a conclusion that effective logistics management has the ability to affirmatively raise a company's performance in regard to cost savings, on-time delivery, satisfying customer demand and growing market share. The study discovered that order processing, inventory, transport and information flow management predicted performance. Both Ngonela *et al*. (2014) and Mwangangi (2016) concluded that that logistics management and outsourcing all of which are functions of logistics design have the potential of improving management performance by reducing costs and increase competitiveness. However, the studies did not explore further the aspect of logistics design explicitly. The current study will, however, explore logistics design as a dimension of logistics management and examine how it affects decision making through incorporation of various elements.

A research on logistics performance and how it affected performance in USA was done Fugate *et al.* (2010) on 150 manufacturing firms. Descriptive research design was utilized. The report illustrated that raising logistics effectiveness and efficiency reduces costs, delivery time, line-product fill rates that in turn enhances sales, return on assets and general performance. The current study will bridge the gap by carrying out the research in a different context which is in Kenya.

2.1.4 Inventory Management and Performance

Inventory management involves a wide array of tasks involving purchasing, packing, planning, storage and receiving. These tasks are different in organizations owing to the industry, the manner of businesses and the processes entailed. (Barnes, 2015). Inventory management is a procedure used by businesses to control the acquisition,

receipt, storage, packing and distribution of products that effectively and efficiently meet their demand (Lai & Cheng, 2019). Inventory management is primarily concerned with showing how the supplied goods are arranged (Mwangi, 2013).

Mankazana *et al.*, (2018), subsequently, sought to determine how efficient inventory management coupled with SCM may aid achieve top-notch performance in manufacturing industries in Johannesburg. Causal design coupled with mixed methodology approach were espoused. All the employees were involved in the study. All employees under department of control of inventory, manufacturing and supply chain were furnished with questionnaire. The study clearly showed that the aforesaid variables have an effect on how well a business performs. It was advised that management see to it that the two departments continue to operate in sync with each other. The present study aspires to bridge the gap by carrying out the research in a different context, Kenya.

Mbah *et al.*, (2019) scrutinized inventory management and operational effectiveness of manufacturing enterprises in South-East Nigeria through a questionnaire distributed to 538 employees. At most 4 listed firms under manufacturing sector were considered. Regression analysis anchored testing of hypothesized statements. Findings ascertained that there is an affirmative substantial nexus between operational effectiveness on one hand and supplier partnership, cost of inventory, and material requirements planning on the other. This study seeks to bridge the gap by using quality control, stock levels and reorder level as the dimensions of inventory management.

Organizations utilize inventory management strategies boost the efficiency of their supply chains. Inventory management techniques are tools used by organizations to achieve supply chain performance. A study was therefore, conducted by Mwangi (2013) addressing management of inventory and SCM while focusing on non-state organizations in Kenya. Those in the agricultural sector were considered. A descriptive research design coupled with use of questionnaires characterized the methodology employed. From the results, there was noteworthy relationship between management of inventory and SCM that denoted 73.2 percent change explained by the independent variables (just in time, economic order quantity, simulation, order batching). The

current study bridges the gap by carrying out the study in a different context the food processing firms.

Kimaiyo and Ochiri (2014), the new KCC as a case study to unearth the influence of managing inventory on performance while considering manufacturing enterprises in Kenya. A representative sample 83 respondents were used. A descriptive research design was espoused. Coupled with inferential statistics were applied to the analysis of quantitative data. The study came to the conclusion that reducing costs not only enhances performance but also prepares workers in managing and accepting inventory concept, furnishes an enterprise with adequate resources. Further ordering stocks and maintaining inventory levels may boost profitability. In addition, control of inventory, information exchange and channel relationship impact productivity. The present study will carry out research in a different context that is food processing firms in Nairobi county.

Using a case of Safaricom Kenya Ltd., Kamau and Kagiri (2015) explored the interaction between management of inventory activities and competitiveness. Descriptive research design was used. Stratified random sampling was used to pick a sample of 80 personnel from targeted departments. Data were pooled using a semi-structured questionnaire. The results indicated that the competitiveness of Safaricom Company was affected by investment, shrinkage and turnover of inventory. The study inferred that practices used to manage inventory are essential to the ability of an organization to compete. Deductively, techniques used to manage inventory have an impact on maximizing profits, satisfying clients, growth of market share and returns on money invested. The present study will bridge the gap by using descriptive research design.

Ngugi *et al*. (2019) studied how systems used in managing inventory affected performance while been biased on manufacturing enterprises in Eldoret, Kenya. The study was guided by three independent variables namely VMI,ABC analysis and Just in time. Data were gathered by use of questionnaire. SPSS aided in analyses of gathered data. The study ascertained that Vendor Managed Inventory (VMI) impacted performance of the said enterprises and so was the Just in Time (JIT). Similarly,

Nyawanga and Otinga (2021) came to the conclusion that manufacturing enterprises gain from optimally managing inventory after delving into management of inventory and performance of procurement in Law Courts in Kakamega County. Key influencers of procurement efficiency were vendor managed inventory system, economic order quantity, and just in time.

In both studies, Ngugi *et al*., (2019) and Nyawanga and Otinga (2021) underscore the importance of JIT inventory management system. This is similar to the conclusions of Mukopi and Iravo (2015) looked at how well sugar producing enterprises procurement functions performed in Western Sugar Belt in Kenya. the effect of inventory management on performance of the procurement function of sugar manufacturing companies in the western sugar belt. Mukopi and Iravo (2015) applied the descriptive research design targeting the thirty procurement workers drawn from Butali, Mumias, West Kenya, and Nzoia Sugar Companies. The research established that there was robust correlation between just in time and efficiency of the procurement function. However, the three studies while underscoring the merits of JIT, failed to show how it affected the supply chain performance in general. In the present study other aspects on inventory management will be examined as well and their effects on the supply chain.

In the same way, Ontita (2016) intended to ascertain the association between Kenyan textile companies' performance and strategies used to manage inventory. The foregoing was investigated using a descriptive cross sectional approach. The target population included all the 35 textile manufacturing firms in Kenya. This study exploited first hand data. Questionnaires aided in obtaining data. The study found to a large extent, an affirmative link between operational effectiveness or performance and just in time delivery in textile companies. Nevertheless, there was no clarity on how the JIT procurement affected the supply chain performance in the textile industry. The present study, will however, examine JIT and other approaches to inventory management.

However, there are studies which have examined inventory management from several dimensions. For instance, Wanyonyi (2017) delved into how service delivery in main supermarkets was affected by the practices used in managing inventory in Nairobi. Descriptive research design was espoused. The nexus between practices of managing

inventory, and delivery of service, and its scope were determined by employing a survey of main supermarkets. It was discovered that the big supermarkets used JIT, ABC, EOG and VMI models to control inventory; however, VMI was implemented to a considerable extent. However, the study was not focused explicitly on the food processing industry. The present study will, therefore, examine the performance of these different aspects of inventory management in the food processing industry

2.1.5 Moderating effect of Firm Size on Performance

Ali (2017) looked at how firm size in Kenya affected how manufacturing enterprises performed in Kenya relative to strategic planning dimensions. The study used a cross sectional survey design. A sample 191 firms in 12 subsectors among manufacturing firms in Nairobi was employed. Data was pooled through a questionnaire. Inferential statistics were incorporated in analysis. The findings depicted that strategic planning was substantial and affirmatively correlated with business performance when examined through the lenses of management engagement, strategic orientation, and strategic control. However, firm size, did not moderate the association between dimensions of strategic planning and enterprise performance. Specificity in strategic planning dimensions positively benefits both small and large firms despite their disparity in development and resources. The study while revealing the negligible effect of firm size on performance, failed to factor in SCMPs of the firm and therefore the current study bridges the gap by looking at the moderating effect of firm size on the relationship between supply chain management practices and performance of food processing firms.

The theme of sustainable SCM for organizations has a substantial practical value as a strategy for sustainable development. In China, Wang *et al*. (2018), therefore, examined the moderating effect of firm size on sustainable performance improvement through sustainable SCM. The study used a structured regression analysis using SPSS to evaluate the moderating effect of enterprise size of sustainable SCM activities and sustainable performance of firms while using data from 172 Chinese companies. The results showed that environmental and social performance were favorably correlated with sustainable SCM practices and enterprise size. Enterprise size moderates the influence of sustainable SCM practices on performance. Additionally, sustainable SCM internal processes to a large extent boost financial performance of larger firms but not

as much for SMEs. The current study bridges the gap by carrying out the study in different context, Nairobi county.

The moderating effect of firm size on green SCM and environment performance across South African construction enterprises was investigated by Fianko *et al*., (2021). Quantitative survey design was utilized and representative sample of 217 workers was used. Structural equation modeling aided in data analyzing. The results revealed that green design and environmental performance were not largely correlated. Nevertheless, green design benefits external green efforts such as green purchasing and construction. Moreover, environmental performance directly benefits from green construction and purchasing. Enterprise size did not moderate the association between environmental performance among constructions firms and external green supply chain practices. The study did not, however, examine moderating effect of enterprise size on nexus between SCM practices on performance of an enterprise.

Ali *et al*., (2016) determined the moderating effect of firm size on relationship between functional integration and enterprise performance in Kenya. Descriptive survey approach was adopted. Questionnaires were used to gather data from 176 manufacturing enterprises. The findings showed that the level of focus placed on the functional integration component of strategic planning in the firms was highly correlated with the performance of manufacturing enterprises. The study came to additional finding moderating effect of firm size on relationship between functional integration and enterprise performance in Kenya. The implication is that operational integration is available to large, small and medium manufacturing enterprises as a capability tool. The study, failed to investigate the dimension of SCMPs when investigating the moderating effect of enterprise size on the performance of an enterprise which has be examined on the current study

In their study, Mutunga and Owino (2017) looked at how firm size influenced the relationship between micro variables and financial performance of manufacturing enterprises in Kenya. Descriptive research design was employed. Data from 180 manufacturing enterprises were gathered using questionnaire. Analyzing of data involved the application of regression, correlation and descriptive. The study's findings

indicate a clear correlation between micro variables and business financial performance that is substantial and beneficial. Furthermore, the correlation is moderated by enterprise size.

Peris Wambua (2017) examined the influence of internal business value chain practices and performance of manufacturing firm in Nairobi county. The specific objective of the study included supplier relationship management practices, process management practices and IT support practices. Firm size was used as a moderator variable. The target population was 499 firms. Stratified sampling was used and a sample size of 200 firms was arrived at. Primary data was collected using questioner and the questioners were administered using a drop and pick method. Multiple linear regression was used to show the hypothesis relationship between variables. The results indicated that BVSC has a positive and significant effect on supply chain performance of the manufacturing firms. Firm size however it did not moderate the relationship between BVSC and the performance of the manufacturing firms.

Another study by Kevin and Kumar (2017) on effects of supply chain management practices on performance of manufacturing firms in Kenya and the moderating effect of firm size on the relationship. The study used level of information sharing, outsourcing and total quality management as the independent variables. The study employed quantitative data collection procedures thus questionnaire survey strategy was used. The study concluded that there was a significant and directional relationship between SCMPs, and the performance of manufacturing firm's. The study also concluded the firm size did not moderate the relationship between SCMPs and performance. The present study will bridge the gap by using firm size on the performance of food processing firms as a moderator variable on the relationship between SCMPs and performance of food processing firms.

In a rather different context, Kenya, Mutua (2017) examined the effects of supply chain management practices om performance of flour milling companies in Nairobi county and the moderating effect of firm size on the relationship between SCMPs and Performance of flour milling companies. focused on information sharing, customer relationship management and outsourcing. Descriptive research design was used in the

study. The target population comprised of 16 flour milling companies in Nairobi and purposive sampling design was adopted in the study where the sample size was 48. Both descriptive and multiple regression were used on the study. The correlation tested revealed that customer relationship management, information sharing and outsourcing positively correlated with the performance of flour milling companies in Nairobi County. The study further revealed that firm size moderated the relationship between SCMPs and performance. The study however focused on flour millers alone and failed to focus on other food processing companies in Nairobi County. The present study will bridge the gap by considering all the food processing firms in Nairobi county and use firm size as a moderator.

2.2 Theoretical Review

The study is premised on Complexity Theory in Logistics, Lean Theory and Grey System theory.

2.2.1 Complexity Theory in Logistics

Wilding, (1998). was one of the first writers to apply complexity theory to logistics. In his article "The supply chain complexity triangle" complexity is explained as ambiguity around supply chains. Other scholars aver that what leads to complexity in logistics are unpredictability of client expectations due to changes in preferences, consumption pattern and time needed for sub-processes such as the payment process, inspection process, scheduling process and routing processes of the goods to be transported.

Choi *et al*. (2017) opines that if we view supply networks as complex adaptive systems rather than just systems then we ought to manage them accordingly. They set out to respond to the widespread consensus in the present literature that individual enterprise optimizations will result in sub-optimization for the entire supply network. They claim that the aforesaid has expended growing amounts of time, funds and effort in the struggle to foresee and govern their extended supplier network. (2001 p.351). While examining CAS, they identify 3 foci that are internal process, environment and coevolution. The authors define, traits, behavioral phenomenon, roles in such a way that agents and their schema and self-organizing behavior and emergent results are present for internal process.

This Theory will enable the current study to gain more insight regarding logistics management effect on enterprise performance from; internal mechanism, environment and coevolution perspectives. Further, the theory will highlight how logistics management can be instrumental in mitigating the various challenges in the vehicle routing, vehicle scheduling and logistics design in the supply chain of food processing enterprises in Nairobi County.

2.2.2 The Lean Theory

James *et al*. (1996) coined the term lean thinking. Lean Theory is an expansion of just in time principles. Just in time is explained by as a pull-based process created to synchronize production, management of supply chains and business activities in manufacturing enterprises. The chief aim of just in time is to decrease inventory holding cost and increase the inventory turnover. The theory does away with buffer stocks and reduces wasteful production (Green & Inman, 2015).

This theory explains how businesses can increase ordering flexibility, decrease on-site inventory holding and cut operating expenses by contracting with third party logistics enterprises for management of distribution tasks. At firm level, Feinberg and Keane (2016) explain their findings on distribution management. They continue by stating that at the aggregate level, timing and size of adoption are what give the lean explanation its empirical support. The rationale of lean thinking is to create a lean enterprise, one that profitably offers creative products while reducing excessive over-costs to clients, environment and suppliers and maintains growth by synchronizing client satisfaction and worker satisfaction.

Inventory leanness positively affects profitability of a business firm and is the top inventory control mechanism. Enterprises that are leaner than industry mean typically have affirmative returns to leanness (Eroglu & Hofer, 2021). Howerever, Lean faces a great deal of criticism, despite the numerous examples of its successful usage across a broad range of industries. It said 70% of companies reporting that they started lean efforts within the previous 2 years had failed to break the 5% improvement barrier in regard to cost cutting. (AlixPartners, 2011). The main criticism is that Lean removes

excess inventory, and takes away the buffer time that is often built into processes. When problems come up, they impact production much more than they otherwise would.
Therefore, lean theory will provide insight into the inventory control practices in the manufacturing sector supply chain in Nairobi County and whether these translate to better performance of the food processing firms.

2.2.3 Grey Systems Theory

Julong Deng formulated this theory in 1982. In regard to information, the systems without information for instance structure messages, functions processes, are called grey systems. One of the primary traits of ambiguous system is incomplete information. Four circumstances characterize incomplete system information that are incomplete information on system structure, its boundary information, information on tenets, system behavior incomplete information and system behavior incomplete information. As noted in social, economic and scientific research endeavors, the issue of insufficient information is frequently present. For instance, in agricultural productions, is difficult to accurately forecast the output in produce due to doubts in natural environment, weather patterns, labor even if we have complete knowledge about seeds, irrigation and plantation.

Completeness of information is regarded relative while incompleteness of accessible information is absolute. Man uses his imperfect intellectual ability to observe the infinite universe to get complete information (Julong & Chaoshun, 1985). The inherent inaccuracy in a given data is another essential trait of uncertain system. Grey system in its multifaceted nature means that it can be successfully applied in supply chains to understand the information uncertainty and its effects on the performance of the systems. The Grey Systems Theory has been criticized for dwelling so much on the absence of information systems without providing insight into how the availability of information or even information paralysis can itself turn out to be information asymmetry (Sifeng & Yang, 2012).
This theory will be instrumental in understanding the information gaps inherent in the information exchange practices in the supply chain in the food-processing sector in Nairobi County.

2.3 Summary of the Research Gap

A review of the research on supply chain management practices resulted in the identification of several elements that appear to be critical to the success of organization development. From the literature review it is clear that scholars have different views on the supply chain management practices that are key to organization performance. They however seem to agree on the main practices which are strategic supplier relationship, customer relationship, information sharing, information quality and out sourcing. However, the studies reviewed so far such as Ohet al., (2012), Larke et al., (2018) and Ristovska et al., (2017) while underscoring the importance of accurate, relevant and timely information from inside and outside the company in appropriate and timely decision making, failed to link them to supply chain practices. The studies reviewed, such as, Mellat-Parast and Spillan (2014), Zhang et al., (2015) and Kenyon & Meixell, 2007) while noting that companies must respond to changing customer needs, and logistics flexibility is an important part of the response, were also not so clear on the effect of logistics design on organizational performance of the manufacturing firms. The studies were not also explicit on the effect of supply chain practices such as inventory management on supply chain performance. Supply chain is becoming more complex by the day as firms increase their inter-dependence as such, case studies such as those carried out by Mukopi and Iravo (2015) on sugar firms, Ontita (2016) on textile firms and Mulumba (2016) on agro-chemical firms cannot suffice to explain holistically the SCM practices in manufacturing firms. Fawcett *et al* (2008), determined the effect of information sharing on performance of manufacturing firms and used interview in data pooling while the current study used questioneers.

The study carried out by Ristovska *et al*. (2017) and Fawcett *et al* (2008),were based on supply chain. performance while the present study will be based on operational performance. In a rather different context, Kenya, Mutua (2017) examined the effects of supply chain management practices om performance of flour milling companies in Nairobi county and the moderating effect of firm size on the relationship between SCMPs and Performance of flour milling companies. The study however did not did not consider all the manufacturing firms in Nairobi county. Different organizations rank these practices differently whereby one supply chain management practice can be widely adopted by an organization but minimally adopted or even not at all used by

another organization. Therefore, the present study will attempt to explain the SCMP from a cross sectional point of view

2.4 Conceptual Framework

The Figure 1 illustrates the hypothetical relationship between independent constructs and the dependent construct.

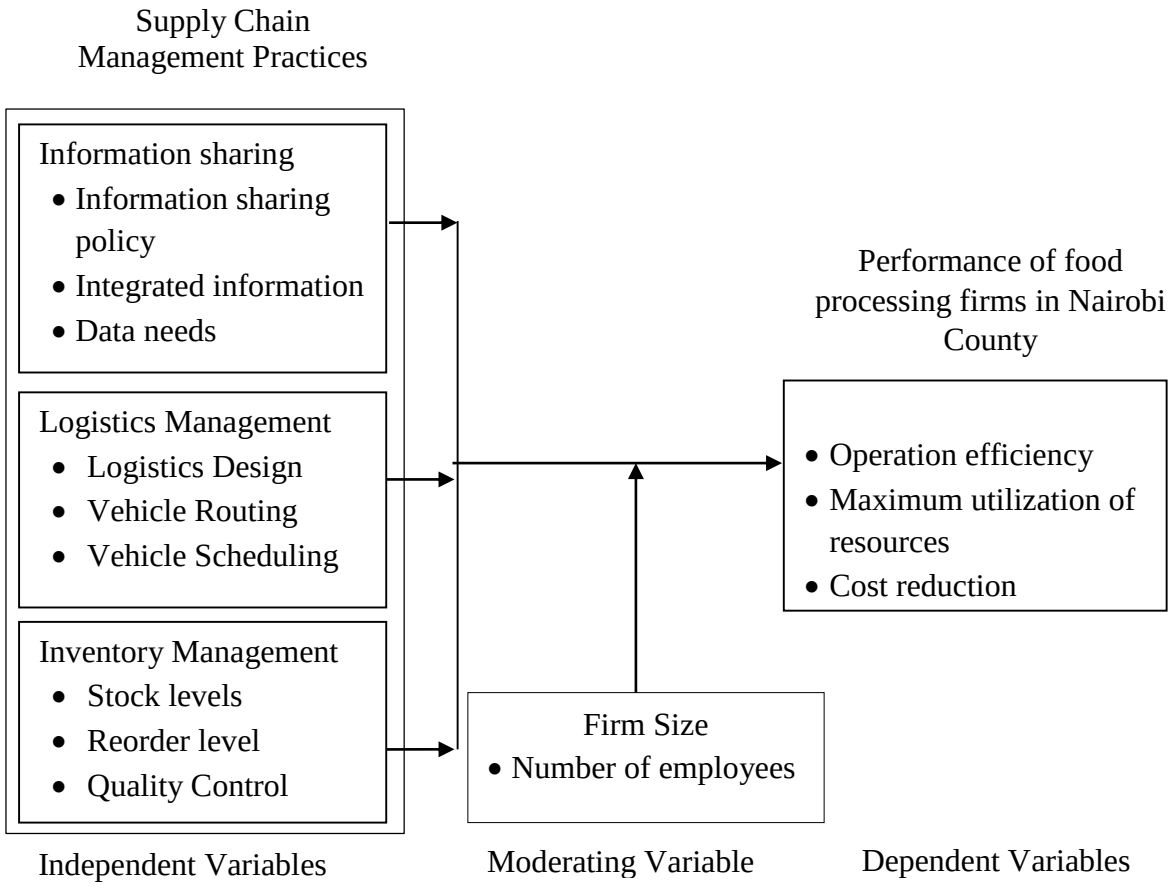

Figure 1: Conceptual Framework
Source: Researcher (2022)

Information sharing practices are the agreed methods of disseminating information within a firms within the supply chain will largely depend on the amount and quality of data shared with and to the firms. Information sharing policy are the rules that guide on which information to share within and outside the organization. Integrated information system is a combination of information from different data bases. When information is integrated in the food processing firms it helps to keep data up to date hence leading to sharing of real time information. Supply chain performance is data driven and the performance of firms within the supply chain largely depend on the amount and quality of data shared within and outside the firms. This might ultimately affect performance of the food processing enterprises in the supply chain. Logistics design entails product coupled with design strategies that lower logistical costs and boost client service; it

involves a collection concepts in the wide SCM. Vehicle scheduling is an important step within the public transport planning and describing the process of assigning vehicles to the trip of a timetable to enhance effective transportation of raw materials and finished good to various places. The routes designed have adopted in the logistics have important implications for the supply chain performance.

The routing, therefore, is expected to significantly affect the logistics productivity of food processing enterprises. In managing inventory, because client loyalty is impacted when businesses do not have sufficient inventory to meet demand, planning for inventory is necessary to guarantee optimal quantities are stocked. Therefore, in this study inventory management is expected to affect stock levels which could alter how well food processing enterprises perform in the supply chain. Performance will be measured by operation efficiency. The size of an enterprise might be a sign that it is expanding and that the market will react favorably. Therefore, firm size has been used variously in extant studies as a moderating variable rather than as an explanatory variable to explain differences in the scale of operations of the firms. However, there have been limited mixed findings on moderating effect of enterprise size on organizational performance which are mostly attributed to the measurement of the performance construct.

2.5 Operationalization of Variables

Table 1: Operationalization of Variables

Variable	Construct/Indicator	Measurement
Information Sharing	• Information sharing policy • Integrated information system • Data needs	• 5point Likert scale
Logistics Management	• Logistics Design • Vehicle Scheduling • Vehicle Routing	• 5point Likert scale
Inventory Management	• Stock levels • reordering • Quality Control	• 5point Likert scale
Firm size	• Number of employees	• 5point Likert scale
Performance	• Low level of Wastages • Maximum utilization of resources • Cost reduction	• 5point Likert scale

Source: Researcher (2022)

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Location of the Study

This study was carried out in Nairobi County which lies between $01^{0}17'11"$ S and $36^{0}49'02"$ E. This region was chosen since it is home to majority of large-scale food processing enterprises creating a huge population from which a sample could be derived. The high industry concentration coupled with the strategic essence of Nairobi as the nexus of the supply chain in the country and the East African region make it ideal for the study. The results that will be found will be applicable to other regions.

3.2 Research Design

The study employed descriptive research design, since it allows the researcher to analyze facts and helps the researcher in developing an in-depth understanding of the research problem (Rahi, 2017). Furthermore, this design allowed the researcher to subject respondents to a series of uniform questions that would permit comparison since the study aspired to get descriptive information regarding SCM practices and performance of enterprises that process food in Nairobi County.

3.3 Target Population

There are currently 172 food processing firms in operation in Nairobi County out of which 56 are medium to large scale and 116 are small (KAM, 2021). Therefore, the study targeted large, medium and small scale food processing enterprises in Nairobi County. From these, observation was the supply chain managers drawn from the food processing firm while the unit of analysis was food processing firms. The respondents of the study were the supply chain manager and the equivalent.

3.4 Sampling Size Determination and Sampling Procedure

3.4.1 Sample Size Determination

The sampling frame was derived from the Yellow Pages directory of the food processing firms in Nairobi County and is shown in (Appendix III). To get the sample size a formula by Yamane (1967) was used;

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

where;

n is the required sample size

N is the target population = 172

e=0.05 which *is* the precision level

Fitting this information into the Yamane (1967), the required sample size is computed as 120.278 ≈ 120 firms.

Table 2: Sampling Frame

Firms	Population of food processing firms	Sample Size	Percentage (%)
Large	29	20	17
Medium	55	38	32
Small	88	61	51
Total	172	120	100

Source: KAM (2019)

3.4.2 Sampling procedure

The stratified random sampling for 172 food processing firms was done. (Table 2). The 172 food processing firms are made up of large, medium and small firms based on the information from the (KAM 2019). The population was divided into three strata (large, medium and small). Simple random sampling was adopted to select the respondents from each set.

3.5 Research Instruments

The data collected was derived from primary source. Primary data is significant since it entails generating new data from sources that already exist (Kombo & Tromp, 2006). Primary data has the benefit of offering comprehensive data for the study over a large area that may also be used with different statistical techniques that permit making conclusions. The direct feedback from respondents in firms that process food was used to gather first hand data. Self-developed questionnaire was used in data gathering. The selection of the tools was premised on the aims of the study, the kind of data to be gathered and the time availability. It has a lot of benefits including saving on time, reduction in bias, it saves on costs, easy accessibility and results can be quantified.

The distribution of questionnaires to respondents' aide to gather bulk information over a short time-span. Furthermore, questionnaire are beneficial where the information sought is in writing. The questionnaires were self-administered to respondents, that is, they were given to the respondents to go and fill them in their own time. The questionnaire comprised of structured questions that entailed giving opinions in a Likert scale.

3.6 Pilot Study

This was undertaken using twelve food processing firms in Thika, Kiambu County, which involved 12 respondents drawn from the firms. The respondents in the pilot study were not to be among those who will participate in actual study Thika is an important manufacturing base in the country with similar characteristics to that of Nairobi County. The results of the piloted questionnaires were used to ascertain reliability and validity of the instruments and make necessary changes on them before actual data collection. The results of reliability for the pilot testing was a 0.7 meaning that the instrument used for data collection meets the requirement.

3.6.1 Validity of Research Instruments

By giving the questionnaire to the supervisor, the researcher made certain the questions measured what they were supposed to measure, that is the content validity as ascertained via recommendations of the supervisor. The researcher ensured face validity by use of appropriate font size, logic arrangement of items and clarity of information.

3.6.2 Reliability of Research Instruments

The study used Cronbach's alpha to ascertain the reliability of the instruments. The Cronbach's Alpha coefficient was used to ascertain the reliability of the items used in the questionnaire. Items that gave Cronbach's coefficient Alpha coefficient of more or equal to 0.7 was treated as acceptable. All the items gave alpha coefficient greater than 0.7.

3.7 Data Collection Procedure

The study collected primary data and the respondents were the supply chain managers. The researcher together with 3 research assistants distributed the questionnaires (Appendix ii) to the supply chain managers. The rationale of the study was communicated and permission sought from firm managers. The respondents were guaranteed that any information they provided would be kept private. The questionnaires were administered via drop and pick later method. Respondents were given sufficient time to complete filling in the questionnaire.

3.8 Data Analysis

Before being coded and submitted to additional analysis, data were cleaned and modified. The Statistical Package for Social Sciences (SPSS) version 28 aided in analysis of the data. Descriptive statistics were done using measures of central tendency and measures of dispersion to explain the primary trait of data. Inferential data analysis was done using Pearson's Product-Moment Correlation Coefficient. Correlation was deployed to ascertain the association between studies constructs. The significance of this is that it allows for generalization of research findings to a bigger population. To ascertain whether there was a substantial association between dependent and independent variables, multiple regression model was explicitly used. T-test was used to test the significance of each independent variable at 5% level of significance. F-test measured the overall significance of the model. R squared was used to show the degree of change of dependent variable that is explained by the independent variables in the model. The transformed data will be ready to be used for multiple regression analysis. The multiple regression model is illustrated by the equation;

The study will also carry out simple regressions for the variables in through equations;

$Y = \beta_0 + \beta_1 X_1 + e$ ……………………………………………………………….(i)

where,

Y= Performance of Food Processing Firms in Kenya

β_0 =constant

β_1 = parameter estimates

X_1 = Information sharing practices

$Y = \beta_0 + \beta_2 X_2 + e$ …………………………………………………………….....(ii)

where,

Y= Performance of Food Processing Firms in Kenya

β_0 =constant

β_2 = parameter estimates

X_2 = Logistics Management

$Y = \beta_0 + \beta_3 X_3 + e$ .....(iii)

where,

Y= Performance of Food Processing Firms in Kenya

β_0 =constant

β_3 = parameter estimates

X_3 = Inventory Management

$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e$ ....(iv)

where,

Y= Performance of Food Processing Firms in Kenya

β_0 =constant

β_1 ..... β_3 = parameter estimate

X_1 = Information Sharing

X_2 = Logistics Management

X_3 = Inventory Management

ε is the error of prediction.

After introducing firm size as the moderating variable, equation (v) will become;

$Y = \beta_0 + \beta_1 X + \beta_2 M + \beta_3 X. M + e$ .....(v)

where,

X-composite of SCM practices

Y= Performance of Food Processing Firms in Kenya

ε is the error of prediction.

M is the moderator variable as multiplier adopted from MacKinnon *et al.,* (2007)

The moderating variable explain whether there is moderation or not. If the R^2 increases after introducing the moderator variable, then the moderation is significant.

3.9 Diagnostic tests

The use of linear regression model is justified by four main assumptions for the rationale of making predictions or conclusions and are;

3.9.1 Multicollinearity

Multicollinearity is defined as the statistical absence of a correlation between consecutive errors for instance in case of time series data (Mugenda & Mugenda, 2013). Multicollinearity occurs when 2 or more independent variables in a regression model are extremely but not perfectly associated. This will be tested using Tolerance statistics and Variance Inflation Factor (VIF). The value 10 is the threshold for VIF. The absence of multicollinearity is suggested by VIF values of less than 10 (Rogerson, 2001). Violation of this proposition implies that variables are simply expressions of each other, that is, are not independent and this may distort the findings. Therefore, the decision rule will be to reject the hypothesis that there is no multicollinearity if the VIF values are higher than ten and otherwise accept if the values are less than 10.

3.9.2 Heteroskedasticity Test

Heteroscedasticity arises when error terms lack constant difference. It is primary results from measurement mistakes, and the presence of subpopulation variances. The standard errors present if heteroscedasticity is detected are biased, but do not result in biased parameter estimations. This causes bias in test statistics and confidence level. Heteroscedasticity disrupts assumption that there must be constant variance. In this study, the researcher tested heteroscedasticity by use of PP plots test to establish whether the residual had a constant error variance. Heteroscedasticity is present when the widths of the residuals increase or reduce as the predicted variables increases. Presence of heteroscedasticity was eliminated by log transforming the variables.

3.9.3 Normality

Normality of the error distribution (Mugenda & Mugenda, 2013). If the p-value is larger than 0.05, the null hypothesis must be accepted but if it falls below 0.05, null hypothesis is rejected. Normality was tested using Shapiro-Wilk test since the respondent rate was 100. Violation of the normality assumption can also affect the statistical integrity of the

findings by introducing distortions and bias in the result.P-value of greater than 0.05 indicate a normal distribution of the residual (Thode, 2016).

3.10 Data Analysis Matrix

Table 3: Data Analysis Matrix

Hypothesis	Independent Variable	Dependent variable	Test statistics
$H0_1$: There is no statistically significant relationship between information sharing practices and performance of food processing firms in Nairobi County.	Information sharing	Performance	t-statistic R^2 F-test
$H0_2$: There is no statistically significant relationship between logistics management and performance of food processing firms in Nairobi County.	Logistics management	Performance	t-statistic R^2 F-test
$H0_3$: There is no statistically significant relationship between inventory management and performance of food processing firms in Nairobi County.	Inventory Management	Performance	t-statistic R^2 F-test
$H0_4$: There is no statistically significant moderating effect of firm size on the relationship between supply chain management practices and performance of food processing firms in Nairobi County.	q	Performance	t-statistic adjudted R^2 F-test
$H0_5$:There is no statistical significant joint relationship between supply chain management practices and performance of food processing firms in Nairobi County	Supply Chain Management Practices	Performance	t-statistics R^2 F-test

Source: Researcher (2022)

3.11 Ethical Considerations

Throughout the research process, the researcher followed ethical principles of privacy, sensitiivity to cultural variations, and gender. (Orodho, 2010). The reseacher requested permission via a letter of introduction outlining the purpose of the study and providing sufficient explanations to respondents to enable them make decisons whether to be engaged in the study or not. The real purpose of the study was made evident to the

respondents. The participants were given surerity of privacy and secrecy of the data that they gave. Additionally, there was no requirement that the respondents write their names anywhere on the survey. They were also informed that the data would only be utilized for scholarly purposes. Also a research permit was suought for from National Comission of Science ,Technology and Innovation(NACOSTI) before procedding to data collection.

CHAPTER FOUR
RESULTS AND DISCUSSION

4.1 Response Rate

Cooper and Schindler, (2014) denotes questionnaire return rate to be the number of questionnaires distributed divided by the number of questionnaires returned. The researchers also confirm that a return rate of over 50 percent is acceptable, 60 percent is better while over 70 percent is excellent. The response rate was presented in Figure 2.

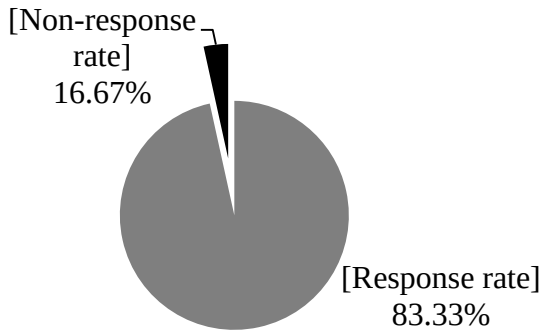

Figure 2: Response Rate

The study targeted to collect data of 120 using questionnaires. Out of which it collected 100, translating to 83.33% return rate which is higher than the response rate of Wanjiku (2019) who found a response rate of 77%. This rate was excellent as it was more than 70 percent as presented in Figure 2 (Cooper and Schindler, 2014).

4.2 Bio Data Information

The section presents the research bio-data and their general information.

4.2.1 Professional Body of Respondents

The study sought to examine the professional body of the respondents as presented in Table 4.

Table 4: Professional Body

Profession	Frequency	Percentage	Valid percent
KISM	59	59.0	59.0
ICPAK	40	40.0	40.0
Any other	1	1.0	1.0
Total	100	100.0	100.0

The study results in table 4 show that most of the supply chain managers 59% were of KISM professional body, 40% of them were of ICPAK professional body while 1% of them were of any other apart from KISM and ICPAK.

4.2.2 Time Worked

The study sought to examine time worked by the respondents in the Food Processing firms as shown in Table 5.

Table 5: Time Worked

Time	Frequency	Percentage	Valid percent
0-5	8	8	7
5-10	9	9	9
10-15	24	24	24
15-20	5	5	5
20-25	45	45	45
25 and above	9	9	9
Total	100	100	100

The study results in Table 5 shows that most supply chain manages 45%, have worked between 20-25 years while the least 5% worked between 15-20 years.

4.3 Reliability Tests

The ascertained the reliability of questionnaire via Cronbach's Alpha coefficient. A coefficient threshold of 0.7 is advised. The internal consistency increases as the coefficient approaches 1 (Hassan &Marston, 2019). Reliability coefficient below 0.5 are Unacceptable, below, 0.6 and above 0.5 are poor, below 0.7 and above 0.6 questionable, below 0.8 and above 0.7 are acceptable, below 0.9 and above 0.8 are good and those greater than 9 are considered Excellent (Sharma, 2016). The appropriate outcome is given in Table 6.

Table 6: Cronbach's Alpha Reliability Coefficients

Variable	Items	Cronbach's Alpha	Comments
Information sharing practices	6	0.753	Reliable
Logistics management designed	6	0.828	Reliable
Inventory management monitoring	6	0.821	Reliable
Performance	10	0.884	Reliable

The Table 6 shows values returned for Cronbach Alpha on itemized constructs. Since the values are greater than 0.7, itemized constructs were reliable and therefore consistent.

4.4 Diagnostic Tests

To ascertain fitness of the model normality, multicollinearity, autocorrelation and heteroscedasticity diagnostic tests were conducted on the model. This was to establish if the assumptions of the Ordinary Least Squares hold.

4.4.1 Multicollinearity Test

The study undertook multi-collinearity test by means of variance inflation factor (VIF) consequent to examining the tolerance values. A tolerance value of over 0.1 for all the independent and dependent variables signifies no multi-collinearity while a VIF of more than 10 (VIF = 10) signifies a problem of multi-collinearity (Field, 2009).

Table 7: Multi-Collinearity Coefficients

Model	Collinearity Statistics Tolerance	VIF	Status
1 (Constant)			
Information Sharing Practices	0.857	1.166	No Multicollinearity
Logistics Management	0.850	1.176	No Multicollinearity
Inventory Management	0.918	1.090	No Multicollinearity

Dependent Variable: Performance

The constructs had a variance inflation factor of under 10 and a tolerance value of over 0.1, ruling out chance of multi-collinearity. The results therefore, indicated absence of a multi-collinearity problem among the constructs and hence the level of multi-collinearity in the model could be tolerated. Therefore, the decision rule will be to reject the hypothesis that there is no multicollinearity if the VIF values are higher than ten and otherwise accept if the values are less than 10. These outcomes indicate the absence of inter-correlation among the explanatory variables hence the findings of this research can be depended upon.

4.4.2 Heteroscedasticity Test

As noted Zhu, K. (2019 heteroscedasticity occurs when the variance of the error term is not constant. It can start when there is a measuring inaccuracy and when the populations are divided unevenly. This hypothesis contradicts the supposition of linear model regression that berates the argument that variance of error term stays constant. This violation ensures that each reflection is consistently equal ensuring the objectivity of estimations of the regression coefficients and hypothesis tests relating to them. Furthermore, when some substantial variables are excluded from the model, heteroscedasticity may occur Zhu, K. (2019) affirms that, P-P plots are the best way to show the distribution of residuals, making them beneficial for testing heteroscedasticity. The results presented in Figure 3. This test was done to ascertain absence of measurement errors. Heteroscedasticity was tested using P-P plots method.

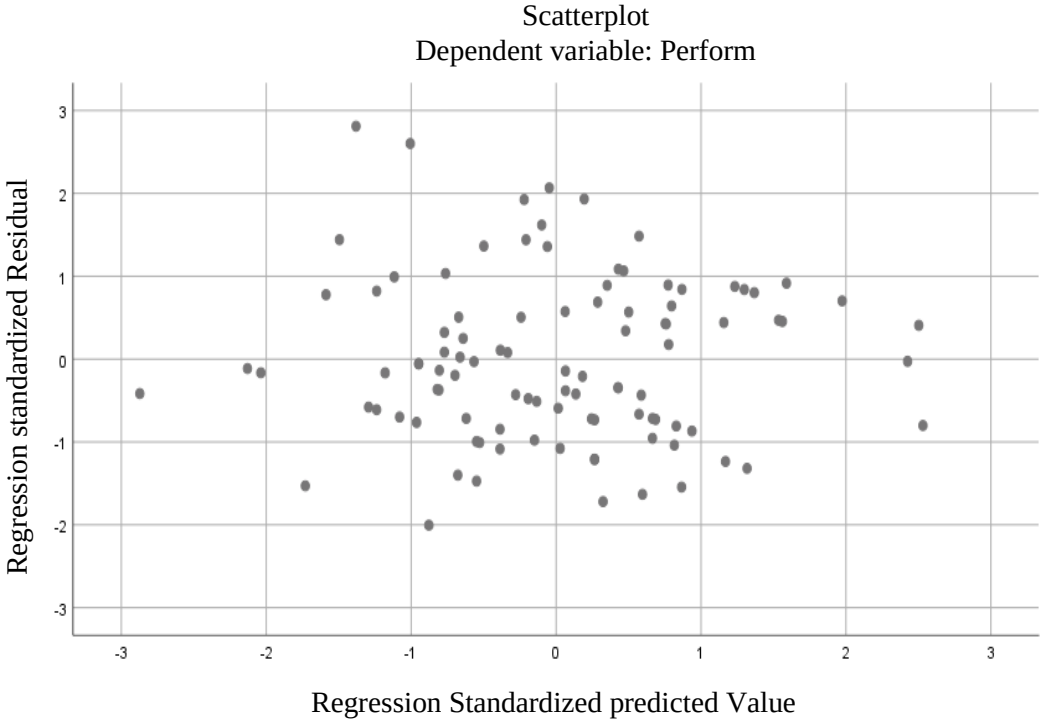

Figure 3: Heteroskedasticity Test

Figure 3 presents the heteroscedasticity test for the multiple regression model between performance, and independent variables information sharing practices, logistics management and inventory management. Heteroscedasticity arises when the widths of the residuals change with corresponding change in predicted variables. From the graph above the width of the plots does not evenly increase or decrease as the predicted variable increase and also no specific pattern formed hence no evidence of the existence

of heteroscedasticity. This removes the biasness in test statistics and confidence level.

4.4.3 Normality Test

The researcher focused on normality test to determine the normality of the error term. Kolmogorov-Smirnov (large sample size) and Shapiro-Wilk test (small sample size) were adopted to check for normality (Thode, 2016). Results presented in Table 8.

Table 8: Normality Test for the Residual

	Shapiro-wilk		
	statistic	df	Sig
Information Sharing Practices	0.944	100	0.072
Logistics Management	0.934	100	0.085
Inventory Management	0.956	100	0.092
Performance	0.933	100	0.143

Shapiro-Wilk test was adopted to check the normality of the constructs in this research. Results in Table 8 show significance value for information sharing practices, logistics management, inventory management and performance were > 0.05, hence showing a normal distribution of the residual. For sample sizes of less than five hundred, Shapiro Wilk test is recommended. P value of greater than 0.05 indicate a normal distribution of the residual (Thode, 2016). Therefore, it was apposite for use in analysis since the residual was normal.

4.5 Descriptive Statistics

These statistics were employed to define key elements of statistics. Mean which measures central tendency was used in the generality of results whereas standard variance (sd) evaluated variation from the average. Tables 9,10,11 and 12 relay the results.

4.5.1 Descriptive Statistics of Information Sharing Practices

The first construct of independent variable of the study was information sharing practices. Information sharing practices was perceived in terms of supply chain manager's views. Selected statements captured information sharing practices indicators. The respondents were asked to rate their agreement with the statements provided on a five-point scale ranging from: SD – Strongly Disagree; D – Disagree; N – Neutral, A – Agree; and SA – Strongly Agree. Table 9 gives the findings.

Table 9: Descriptive Statistics of Information Sharing Practices

Statement	N	Min	Max	Mean	Std. Deviation
Our firm has developed an information sharing policy	100	2.00	5.00	3.2200	0.54272
Our information sharing policy guides on the information to be shared within the firm	100	2.00	5.00	3.7500	0.62563
Our information sharing policy guides on the information sharing outside our firms	100	2.00	5.00	3.760	0.6834
Integrated information system has helped to improve the performance of our firm	100	2.00	5.00	3.2300	0.52905
Our firm do generate data that can be shared across the supply chain as need arises	100	2.00	5.00	3.9300	0.68542
Our firm has agreed on templates for sharing all necessary data	100	2.00	5.00	3.5600	0.59152
Aggregate	100			3.575	0.6096

The results in Table 9 specify that most of supply chain managers suggested that their firms do generate data that could be shared across the supply chain as the needs arises had the highest mean of 3.9300. Other supply chain managers were undecided on the development of information sharing policy which had a mean of approximately 3.2200. Supply chain managers varied their views on their firms generating data that could be shared across the supply chain as needs arises by a standard deviation of 0.68542. This implies that most of the food processing firms are very keen on the type of information to share across the supply chain since they operate in a competitive environment. Therefore, the overall mean of 3.575 and a standard deviation of 0.6096 indicated that the respondents generally agreed that information sharing practices were incorporated in Food Processing Firms.

4.5.2 Descriptive Statistics of Logistics Management

Logistics management was perceived in terms of supply chain manager's views. Selected statements captured information sharing practices indicators. The findings are relayed in Table 10.

Table 10: Descriptive Statistics of Logistics Management

Statements	N	Min	Max	Mean	Std.Deviation
Our logistics system has been designed to cater for vehicle scheduling	100	2.00	5.00	3.0800	0.41875
Vehicle scheduling in logistics management enable us to make all necessary improvements	100	2.00	5.00	3.3900	0.56667
Our firm do have a predefined routing of the supplies	100	2.00	5.00	3.5900	0.62109
Our routing system takes care of all the required flows in the supply chain	100	2.00	5.00	3.6800	0.64948
Our firm logistics design has helped to reduced cost	100	1.00	5.00	3.7400	0.67600
Our firm has established coordination points in the supply chain to improve vehicle scheduling	100	2.00	5.00	3.7900	0.62434
Aggregate	100			3.545	0.5927

The results from Table 10 indicate that most supply chain manager agreed that their firms had established coordination points in the supply chain to improve vehicle scheduling which had a highest mean of 3.7900. On the contrary other supply chain managers were undecided on the logistics system being designed to cater for vehicle scheduling. However, the supply chain managers had varied views on their firm's logistics design having helped to reduce cost by a standard deviation of 0.67600. Therefore, the overall mean of 3.545 and a standard deviation of 0.5927 indicated that the respondents generally agreed that logistics management practices was implemented in Food Processing Firms.

4.5.3 Descriptive Statistics of Inventory Management

Inventory management was perceived in terms of supply chain manager's views. Selected statements captured inventory management indicators. The study summarizes the responses as captured in the field and relayed in Table 11.

Table 11: Descriptive Statistics Inventory Management

Statements	N	Min	Max	Mean	Std.Deviation
Our firm has a well-established way of monitoring stock levels within the firm	100	2.00	5.00	3.4600	0.74427
Our firm do timely relays of stock levels information	100	3.00	5.00	3.6200	0.59933
Our firm always manages to reorder on time	100	2.00	5.00	3.7400	0.61332
Our reordering system is well automated	100	2.00	5.00	3.8600	0.63596
Our firm has adequate quality control within the supply chain	100	2.00	5.00	3.9000	0.61134
Our firm has quality monitoring points within the supply chain	100	2.00	5.00	3.8900	0.63397
Aggregate	100			3.745	0.6397

Table 11 shows that most supply chain managers agree that their firms had adequate quality control within the supply chain which had the highest mean of 3.9000 This implies that the food processing firms process high quality products thus enhancing customer satisfaction. Other supply chain managers were undecided on their firms having a well-established way of monitoring stock levels within their firms while other supply chain managers varied much on the same view with a standard deviation of 0.74427. Therefore, the overall mean of 3.745 and a standard deviation of 0.6397 indicated that the respondents generally agreed that inventory management practices are implemented by Food Processing Firms.

4.5.4 Descriptive Statistics of Performance of Food Processing Firms

Performance of food processing firms was perceived in terms of supply chain manager's views. Selected statements captured performance of food processing firms' indicators. As responded by the respondents, the study gives a summary of their views in respect of performance as portrayed in Table 12.

Table 12: Descriptive Statistics of Performance

Statements	N	Min	Max	Mean	Std.Dev
Our revenue performance has been improving in the last five years	100	3.00	5.00	3.4100	0.66810
Our delivery times have significantly improved	100	2.00	5.00	3.5500	0.64157
The market quickly absorb majority of our products in good time	100	2.00	5.00	3.8100	0.63078
Our firm has reduced the levels of redundant costs	100	2.00	5.00	3.9500	0.64157
There has been cost reduction as a result of inventory management	100	2.00	5.00	3.9800	0.72446
There has been cost reduction as a result of proper information exchange	100	2.00	5.00	4.0600	0.63277
There has been cost reduction as a result of logistic design	100	2.00	5.00	4.0800	0.74779
Increased resource efficiency as a result of proper information sharing	100	3.00	5.00	4.1300	0.67652
Increased resource efficiency as a result of inventory management	100	3.00	5.00	4.1900	0.69187
Increased resource efficiency as a result of logistics management	100	2.00	5.00	4.2900	0.71485
Aggregate	100			3.945	0.67703

The results from Table 12 indicate that most of the supply chain managers agreed that their firms utilized resources to a maximum level as a result of logistics management which had the highest mean of 4.2900, while other managers were undecided on their firm's revenue performance having improved for the past 5 years having a mean of 3.4100. In contrast to this other supply chain managers had varied views on their firms having cost reduction as a result of logistics design with a standard deviation of 0.74799. Therefore, the overall mean of 3.945 and a standard deviation of 0.67703 indicated that the respondents generally agreed that food processing firms were performing efficiently.

4.6 Pearson Correlation Between the Study Variables

Correlation determines the bearing of a relationship between any 2 variables. A correlation value of zero indicates absence of any association while that of -1 implies a perfect negative relationship between variables. On the other hand, a coefficient of +1 implies a perfect positive relationship between variables under study. Pearson Product Moment Correlation coefficient (r) was applied in determining presence and robustness of the relationship at 5% confidence level.

Table 13: Correlation Coefficients

		Information Sharing Practice	Logistics Management	Inventory Management	performance
Information Sharing	Pearson Correlation	1	0.244*	0.227*	0.218*
	Sig. (2-tailed)		0.015	0.023	0.029
	N	100	100	100	100
Logistics Management	Pearson Correlation	0.244*	1	0.348**	0.359**
	Sig. (2-tailed)	0.015		0.000	0.000
	N	100	100	100	100
Inventory Management	Pearson Correlation	0.227*	0.348**	1	0.431**
	Sig. (2-tailed)	0.023	.000		0.000
	N	100	100	100	100
performance	Pearson Correlation	0.218*	0.359**	0.431**	1
	Sig. (2-tailed)	0.029	0.000	0.000	
	N	100	100	100	100

R is significant at the 0.05 level (2-tailed)

The Pearson correlation was used to determine the relationship between information sharing practices, logistics management and inventory management and performance. The correlation coefficient was 0.218 with p – value 0.029 regarding information sharing practices and performance. This was significant at set confidence level. This connotes an affirmative substantial information sharing practices and performance. The correlation coefficient between logistics management and performance was 0.359 with p –value 0.000. This was at 5% confidence level. The implication is that an affirmative significant relationship existed between logistics management and performance. The correlation coefficient between inventory management and performance was 0.431 with a p –value of 0.000 which was found to be significant the set significance level. The foregoing illustrated a positive significant relationship between inventory management and performance.

4.7 Hypothesis Testing for the Study Variables

The information in the Tables below illustrates the effect information sharing practices, logistics management and inventory management on performance. The coefficients of each independent variable and their respective p-values are presented in Table 14,15 and 16 whereas the combined model is presented in table 17 and the moderating effect is presented in Table 18.

4.7.1 Information Sharing Practices and Performance

The study sought to ascertain the effect of information sharing practices on performance of food processing firms in Nairobi County. A simple linear regression was used to examine this relationship and the hypothesis was postulated as follows;

HO_1: *There is no statistically significant relationship between information sharing practices and performance of food processing firms in Nairobi County*.

The coefficients of information sharing practices and its respective p-value are presented in Table 14(a), 14(b) and 14(c).

Table 14 (a): Summary of the Regression Model 1

				Std. Error of the		Change Statistics			
Model	R	R Square	Adjusted R Square	Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	0.218[a]	0.047	0.038	0.46502	0.047	4.882	1	98	0.029

Table 14(b): Anova for Information Sharing Practices

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1.056	1	1.056	4.882	0.029[b]
	Residual	21.192	98	0.216		
	Total	22.247	99			

Table 14(c): Regression Coefficient of Information Sharing Practices

		Unstandardized Coefficients		Standardized Coefficients		
	Model	B	Std. Error	Beta	T	Sig.
1	(Constant)	3.058	0.404		7.568	0.000
	Information Sharing Practices	0.247	0.112	0.218	2.210	0.029

The R^2 as shown in Table 14(a) is 0.047 denotes that 4.7% of the change in performance can be associated with information sharing practice, the rest (95.3%) of change in performance is explained by other factors not in the model such as order postponement and e-procurement.

Results shown in Table 14(b), F-value (4.882) and a p-value (0.029) shows that the model used was statistically significant since p = 0.029 <(0.05). The findings of this study shows that information sharing practices is a reliable predictor of performance. The study found out that constant of regression was 3.058 implying that holding other factors constant performance is equal to 3.058 units as shown in Table 14(c). The slope of regression model obtained was 0.247 and it implies that an increase in information sharing practices by one-unit results to 0.247 units increase in performance. The obtained (t-statistic was 2.210, P-value of 0.029<0.05) at 5% significance level therefore, the null hypothesis was rejected.

The study adopts the view that information sharing practices was an important consideration that need to be made when determining the performance of food processing firms in Nairobi County. These results are consistent with Ristorska (2017) who carried out a study in Macedonia on the effects of information exchange practices on performance of textile firms. The researchers found that the relevance, timeliness and accuracy of information within and outside the company makes it possible to achieve opportune and timely decision making. The findings also reflect those of Manangi *et al*. (2015) who found out in their study on intervening role of information exchange on information quality and supply chain performance that information exchange in the supply chain allows improved general performance occasioned by implementation of supply chain management principles that raise the dependability and quality of information. These results also match with those reported ealier by Kocoglu *et al*., (2011), whose findings offered helpful intuitions on how firms might use information exchange to boost the efficiency of their supply chains. The results further corroborate the findings of Baah *et al*. (2021) which showed that information exchange is chief to boosting competitive gains and robust supply chain performance.

However, the findings of the current study do not agree with the previous research of Kimitei *et al*., (2015) who found that information sharing practices affected performance negatively. Theoretically, these findings fail to concur with Julong Deng 1985 on the grey system theory that there is no free flow of information and complete messages.

The present findings suggest that information sharing practices could significantly improve the performance of the food processing firms since most of the supply chain managers opined that their firms do generate data that could be shared across the supply chain as the needs arises. The simple regression model for effect of information sharing practices on performance is therefore presented by the equation below.

$Y=3.058+0.247\ X_1$

4.7.2 Logistics Management and Performance

The study aimed at determining effect logistics management had on performance of firms that process food in Nairobi. This was hypothesized as:

HO_2: *There is no statistically significant relationship between logistics management and performance of food processing firms in Nairobi County*.

To test this hypothesis a simple linear regression model was used. The coefficients of logistics management and its respective p-values are presented in Tables 15(a),15(b) and 15(c).

Table 15(a): Summary of the Regression Model 2

					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	0.359[a]	0.129	0.120	0.44462	0.129	14.537	1	98	0.000

Table 15(b): Anova for Logistics Management

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	2.874	1	12.874	14.537	.000[b]
	Residual	19.374	98	0.198		
	Total	22.247	99			

Table 15(c): Regression Coefficient of Logistics Management

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	T	Sig.
1	(Constant)	2.608	0.353		7.379	.000
	Logistics Management	0.372	0.098	0.359	3.813	.000

The R^2 as shown in Table 15(a) is 0.129 denotes that 12.9% of the change in performance can be associated with logistics management, the rest (87.1%) of change in performance is explained by other factors not in the model such as supplier relationship management and customer relationship management.

Results shown in Table 15(b), F-value (14.537) and a p-value (0.000) shows that the model used was statistically significant since p = 0.000 <(0.05). The findings of this study shows that logistics management s is a reliable predictor of performance.

The study found out that constant of regression was 2.608 implying that holding other factors constant performance is equal to 2.608 units as shown in Table 14(c). The slope of regression model obtained was 0.372 and it implies that an increase in information sharing practices by one-unit results to 0.372 units increase in performance. The obtained (t-statistic was 3.813, P-value of 0.000<0.05) at 5% significance level therefore, the null hypothesis was rejected. consequently, the study accepts the view that logistics management was an important consideration that need to be made when determining the performance of food processing firms in Nairobi county.

The results tally with Ngonela's *et al.*, (2014), who addressed logistics outsourcing and tea processing firms in Bomet county and found out that logistics management enhanced cost reduction. The findings are also in agreement with the results of Nyaberi and Mwangangi (2014) who examined how organization performance was affected by logistics management practices in Rift Valley Bottlers Limited in Uasin Gishu County, Kenya and found out that logistics management cannot be wished away and businesses ought to coin order processing techniques to raise performance

Theoretically the findings further support the complexity theory in logistics since complexity is predicted by uncertainty of customer demands due to changes in preferences, consumption pattern and time needed for sub-processes such as the payment process, inspection process, scheduling process and routing processes of the goods transported.

The present findings suggest that logistics management could significantly improve the performance of the food processing firms since most of the supply chain managers opined that their firms had established coordination points in the supply chain to improve vehicle scheduling and vehicle routing which will lead to meeting of lead times and this customer satisfaction.

The simple regression model for effect of logistics management on performance can be presented by the equation below.

$Y=2.608+0.372\ X_2+\mathcal{E}$

4.7.3 Inventory Management and Performance

The study sought to ascertain the effect of inventory management on performance of food processing firms in Nairobi County. A simple linear regression was used to examine this relationship and the hypothesis was postulated as follows;

HO_3: *There is no statistically significant relationship between inventory management and performance of food processing firms in Nairobi County*.

The coefficients of information sharing practices and its respective p-value are presented in Table 16(a),16(b) and 16(c).

Table 16(a): Summary of the Regression Model 3

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics R Square Change	F Change	df1	df2	Sig. F Change
1	0.431[a]	0.186	0.177	0.43000	0.186	22.324	1	98	.000

Table 16(b): Anova for Inventory Management

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	4.128	1	4.128	22.324	.000[b]
	Residual	18.120	98	0.185		
	Total	22.247	99			

Table 16(c): Regression Coefficient of Inventory Management

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	T	Sig.
1	(Constant)	2.104	0.392		5.370	.000
	Inventory Management	0.492	0.104	0.431	4.725	.000

The R^2 as shown in Table 16(a) was 0.186 denotes that 18.6% of the change in performance can be associated with information sharing practice, the rest (81.4%) of change in performance is explained by other factors not in the model.

Results shown in Table 16(b), (F-value 22.324, p-value 0.000) shows that the model used was statistically significant since $p = 0.000 < 0.05$. The findings of this study show that inventory management is a reliable predictor of performance

The study found out that constant of regression was 2.104implying that holding other factors constant performance is equal to 2.104 units as shown in Table 16(c). The slope of regression model obtained was 0.492 and it implies that an increase in information sharing practices by one-unit results to 0.492 units increase in performance. The obtained (t-statistic was 4.725, P-value of 0.000<0.05) at 5% significance level therefore, the null hypothesis was rejected.

It was therefore rejected. since the t value was significant ($p<0.05$). accordingly, the study concurs the view that inventory management was an important consideration that need to be made when determining the performance of food processing firms in Nairobi county. This illustrated a statistically substantial effect of inventory management on performance.

These results concur with the results of Mbah *et al*. (2019), who scrutinized inventory management and operational effectiveness of manufacturing enterprises in South-East Nigeria and established that inventory management leads to better performance of an organization and Mwangi (2013) who reported that inventory management has an affirmative effect on performance. This output concurs theoretically with lean theory by James *et al*. (1996) since every business gain flexibility in ordering decisions and minimizes waste by reducing lead time and this will enhance performance. The present results suggest that inventory management could significantly improve the performance of the food processing firms since most of the supply chain managers opined that their firms had adequate quality control within the supply chain. This improves the customer retention level since when customers receive high quality products they continue purchasing from the same organization

The simple regression model for effect of inventory management on performance can be presented by the equation below.

$Y=2.104+0.492\ X_3+\varepsilon$

4.7.4 Test of the Moderating Effect

The study sought to determine the moderating effect of firm size on the relationship between supply chain management practices and performance of food processing firms. It was hypothesized as;

$H0_4$: *There is no statistically significant moderating effect of firm size on the relationship between supply chain management practices and performance of food processing firms in Nairobi County.*

To test this hypothesis, a multiple linear regression analysis was used. Table 17(a)and (b) gives the results of the analysis.

Table 17(a): Model Summary for Moderating Effect

Model	R	R^2	Adjusted R^2	F change	Sig F change
1	0.499	0.249	0.234	16.096	0.000
2	0.517	0.268	0.245	2.407	0.124

Table 17(b): Regression Coefficient for the Moderation Effect

	Coefficients	Std error	t-statistic	p-value
Model 1				
(Constant)	1.798	0.546	3.290	0.001
Supply Chain Management Practices	0.658	0.138	4.751	0.000
Firm size	-0.119	0.060	-1.969	0.052
Model 2				
(Constant)	3.806	1.404	2.712	0.008
Supply Chain management practices	0.109	0.379	.287	0.775
Firm Size	-1.054	0.605	-1.740	0.085
Supply Chain Management Practices. Firm Size	0.257	0.166	1.551	0.124

There is an increase in adjusted R squared but the p-value is 0.124>0.005 indicating a potentially not significant moderation between enterprise size and the relationship between SCM practices and performance as Table 17(b) depicts.

The results in Table 17(b) show that model 1 is significant at 5% significance level without the interaction effect that is it had a t-statistic of 3.290 and a p-value of 0.000<0.005. Model 2 had a t-statistic of 1.551 and a p-value of 0.124>0.05 which is insignificant at 5% significance level. Thus, the null hypothesis was accepted. Model 2 does not account for more variance change in the interaction between firm size and association between SCM practices and performance.

The effect of supply chain management practices. on performance of food processing firms does not depend on firm size. Conversely the effect of firm size on performance of food processing firms is independent of the supply chain management practices and which is the interaction term. The findings in Table 17 (b) are supported by the insignificant interaction between supply chain management practices and firm size. The null hypothesis;

However, these results contradict the Mutunga and Owino (2017) who studied how firm size influenced the nexus between micro variables and financial performance of manufacturing enterprises in Kenya and concluded that firm size affects the relationship positively. The above results also differ with Wang *et al*. (2018), therefore, examined the moderating effect of firm size on sustainable performance improvement through sustainable SCM and concluded that Enterprise size moderates the influence of sustainable SCM practices on performance. In a rather different context, Kenya, Mutua (2017) examined the effects of supply chain management practices on performance of flour milling companies in Nairobi county and the moderating effect of firm size on the relationship between SCMPs and Performance of flour milling companies. The study concluded that firm size moderated the relationship between SCMPs and performance of flour milling companies.

These results are similar to Ali *et al.,* (2016), who carried out a study on moderating effect of firm size on relationship between functional integration and enterprise performance in Kenya and found out that firm size did not moderate the relationship between functional integration and enterprise performance in Kenya. The results are also similar to those of Fianko *et al*., 2021 who studied the moderating effect of firm size on green SCM and environment performance across South African construction

enterprises and concluded that Enterprise size did not also moderate the association between environmental performance among constructions firms and external green supply chain practices. The results also concur with those of Peris Wambua (2017) examined the influence of internal business value chain practices and performance of manufacturing firm in Nairobi county and found out that firm size did not moderate the relationship between BVCP and performance of manufacturing firms. Another study by Kevin and Kumar (2017) on effects of supply chain management practices on performance of manufacturing firms in Kenya and the moderating effect of firm size on the relationship concurred with the findings that firm size did not moderate the relationship between SCMPs and performance of manufacturing firms. The current study seems to uphold this assertion since the results agree.

4.7.5 Joint Effect of Supply Chain Management Practices and Performance

The study examined the joint effect of information sharing practices, logistics management and inventory management and performance the following hypothesis was tested.

HO_5: *There is no statistically significant relationship between information sharing practices, logistics management and inventory management and performance.*

Multiple linear regression model was employed to test this hypothesis. The regression findings are presented in Table 18 (a), 18(b) and18 (c)

Table 18(a): Summary of the Regression Model 4

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics R Square Change	F Change	df1	df2	Sig. F Change
1	0.493[a]	0.243	0.219	0.41896	0.243	10.248	3	96	0.000

Table 18 (b): Anova for Combined Effect of Supply Chain Management Variables

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	5.397	1	1.799	10.248	0.000[b]
	Residual	16.851	98	0.176		
	Total	22.247	99			

Table 18 (c) Regression Coefficient of Combined Effect

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	1.336	0.502		2.660	0.009
	Information Sharing Practices	0.381	0.110	0.334	3.477	0.001
	Logistics Management	0.230	0.100	0.222	2.304	0.023
	Inventory Management	0.100	0.105	0.088	0.949	0.345

As portrayed in Table 18 (a), the value of R-squared was 0.243 and a p-value of 0.000< 0.05 implying that SCMPs has a positive effect on performance. This further impliedly means that 24.3 % of the change in performance is explained by information sharing, logistics management and inventory management while the remainder 75.7% of difference in performance is as a result of other tenets. To gauge the influence of information sharing practices, logistics management, inventory management on performance. Anova analysis of supply chain management variables was presented in Table 18(b)

Table 18(b) shows that F-value (10.248) and a p-value of 0.000 denoting that the general model was statistically significant since $p = 0.000 < 0.05$. Therefore, the null hypothesis was rejected. This particular finding of this portrays that information sharing practices and logistics management is a good predictor of performance. The regression coefficient of joint effect of supply chain management practices was presented in Table18(c)

As indicated in Table 18 (c) the study found that the constant of regression was 1.336. The slope of information sharing practices, logistics management, and inventory management were obtained as 0.381, 0.230 and 0.100 respectively. From the finding's information sharing practices and logistics management affect performance whereas inventory management does not affect performance since it has a p-value of over 0.05.

These results are similar to those of Sukati *et al*.(2011),carried out a research on the relationship between supply chain management practices and the competitive advantage of a firm in Malaysia Manufacturing industries and found that SCMPs affected the performance of manufacturing firms positively.The results further concur

with Vincensia Anyango Apopa (2018) who studied influence of supply chain management practices on performance of government ministries in Kenya and concluded that there was a positive association between SCMPs and performance of the government ministries.

However the results contradict with those Hussein (2014) who investigated the effects of supply chain management practices organization performance in consumer food manufacturing industry of Pakistan management practices. The findings indicated that SCMPs had a negative effect on the performance of consumer food industry. The results further revealed that supply chain management practices are not much practiced.

The present findings suggest that information sharing practices, logistics management and inventory management could significantly improve the performance of the food processing firms since most of the supply chain managers opined supply chain management practices have a positive impact on firm performance therefore they ought to be incorporated to improve the performance of food processing firms . Therefore, the regression model for effect of SCM variables on performance can be expressed as follows:

$Y=1.336+0.381X_1 + 0.230X_2$

CHAPTER FIVE
SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Summary

Food processing firms have shown low performance trends in terms of productivity and effective operation (KAM, 2015), hence raising uncertainty on the capacity of the sector to drive to vision 2030. It is on this basis that the present study undertook research on the Supply chain management practices with the view to improve the performance of food processing firms in Nairobi county. The study determined the effect of SCMPs on performance of food processing firms in Nairobi County. The Specific objectives were; to assess the effect of information sharing practices on performance of food processing firms in Nairobi County; to determine the effect of logistics management on performance of food processing firms in Nairobi County; to determine the effect of inventory management on the performance of food processing firms in Nairobi County; to determine the moderating effect of firm size on the relationship between supply chain management practices and performance of food processing firms in Nairobi County. The following is the summary of findings on these objectives:

The first objective of the study was to dermine the effect of information sharing practices on performance of food processing firms in Nairobi County. The results of this objective indicated most of supply chain managers suggested that their firms do generate data that could be shared across the supply chain. The results also depicted that most of the food processing firms are very keen on the type of information to share across the supply chain since they operate in a competitive environment. The findings further revealed that information sharing practices positively affected performance of food processing firms in Nairobi county hence it is an important factor to be considered to improve the performance.

The second objective sought to ascertain influence of logistics management on performance of food processing firms in Nairobi County. The results of this objective indicated that logistics management substantially affected performance in food processing firms. The results further showed that the food processing firms had established coordination points in the supply chain to improve vehicle scheduling. The findings further revealed that, the supply chain managers had varied views on their

firm's logistics design having helped to reduce cost. The present findings suggest that logistics management could significantly improve the performance of the food processing firms.

The third objective established the effect of inventory management on performance of food processing firms. The results of this objective indicated that inventory management had an affirmative effect on performance of food processing firms in Nairobi County. The results also revealed that most of the food processing firms had adequate quality control within the supply chain to ensure that the quality of goods produced and delivered to the customer are up to the standards. The results further revealed that through quality control there is reduction in cost where the reverse logistics cost and the cost of losing customers is reduced. The present findings suggest that inventory management could significantly improve the performance of the food processing firms.

The fourth objective of the study was to assess the joint effect between supply chain management practices and performance of food processing firms in Nairobi county. The study found that the constant of regression was 1.336. The slope of information sharing practices, logistics management, and inventory management were obtained as 0.381, 0.230 and 0.100 respectively. From the findings information sharing practices and logistics management affect performance whereas inventory management does not affect performance since it has a p-value of over 0.05.

The fifth objective of the study was to assess the moderating effect of firm size on the relationship between supply chain management practices and performance of food processing firms. The study established that firm size did not moderate the relationship between SCMPs and performance of food processing firms and that the effectof firm size on performance of food processing firms is independent of the SCMPs which is the interaction term.

5.2 Conclusion

The study examined how SCM practices affected the performance of food processing firms performed in Nairobi County. The following conclusions were arrived at based

on the findings of the study: Information sharing practices was found to significantly influence the performance of food processing firms. Hence information sharing practices contribute to the improvement of performance of food processing firms in the country and must be factored in the performance models. This might be explained on the basis that food processing firms have in place information exchange policies that specify how information should be shared inside the enterprise.

Logistics management was found to have had a positive and significant influence on the performance of food processing firms. Therefore, the study concludes majority of logistics systems are designed to accommodate vehicle scheduling and routing, making sure that lead times are met and boosting client satisfaction.

Inventory management, was also found to positively and significantly affect the performance of food processing firms. This means that when a firm has a reliable system in place for quality control and monitoring stock level, this impacts on performance. Firm size was not substantial to the association between SCM practices and performance in that the association remained unaffected.

Information sharing coupled with management of logistics are vital tenets in performance of firms, particularly those in food processing sector. Inventory management on the other hand is not a substantial element in performance. The size of the firm used as a moderating variable does not alter the relationship between SCMPs and how enterprises perform.

5.3 Recommendations

The current research established supply chain management practices and their effect on performance of food processing firms in Nairobi County. The moderating effect of firm size was also explored. The study results present the following recommendations:

i. Based on the findings of objective one, information sharing practices were found to be significant and positively influence performance of food processing firms. It is recommended that Firms guarantee that information is properly transferred inside the organization and to maintain the organization's operations, enterprises must promote information exchange procedures. In

addition to this High level of information sharing within the SCM improves the success of supply chain and contributed to better performance of organizations therefore firms should invest more in the information sharing platforms such as the EDI to enhance free flow of information.

ii. Based on the findings of objective two logistics management were also found to be significant and positively affect the performance of food processing firms since it assist in the effective flow of goods and services from the point of origin to the point of consumption. With the intent of cutting expenses, firms are advised to incorporate the aspect of vehicle routing and vehicle scheduling where during transportation the vehicles will be able to use predetermined routes and stick-on specific schedules to minimize any cost and at the same time enhance customer satisfaction.

iii. Inventory management was found to positively affect the performance of food processing firms. It is therefore recommended that firms should establish adequate quality control and quality monitoring points in order to get the best quality during the production and also as a way of minimizing on cost.

iv. Lastly, the government ought to implement SCMPs and strategy that encourages businesses to promote prudent management strategies regarding inventory to boost revenue.

5.4 Suggestions for Further Research

This study has several suggestions for possible areas for further research:

i. The study established that the three variables (information sharing practices, logistics management and inventory management) only explained a small percentage change in the performance of food processing firms. This study therefore suggests that future researchers would carry out more research using different variables that were not included in the study.

ii. This study was in particular based on food processing firms in Nairobi county. These firms had distinctive characteristics given that they only deal with food Processing. future studies should be conducted in other firms and other contexts, the service sector.

iii. The current study was carried as a one-time period data collection. Therefore, further research should be done for a longer period of time to track the changes over a longer period of time, longitudinal research.

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APPENDICES

Appendix I: Letter of Transmittal

Linda Mayabi
Box3147,
Chuka

The Manager,
Manufacturing firm
P.O. Box
Nairobi

Dear Sir/Madam,

RE: REQUEST TO CARRY OUT RESEARCH WITHIN THE ORGANIZATION

I am a postgraduate student of Chuka University- Student No. **CM16/45798/20** and currently taking a Master of science in procurement and logistics management. I am doing a research on the ***effect of supply chain management practices on performance of food processing firms in Kenya focusing on Nairobi County.*** This research is to be conducted only in the area and is for purely academic purposes only; however, evaluation results may be made public after the completion of the study for future researchers and other relevant stakeholders to guide them in their work.

Every care was taken in the data collection procedure to ensure that it is within ethical limits.

Thank you in advance for your cooperation.

Yours faithfully

Linda Mayabi

Appendix II: Questionnaire

You are asked to take part in this study that focuses on the *effect of supply chain management practices on performance of food processing firms in Kenya focusing on Nairobi County*. The results of this study are only produced to meet academic requirements. All supplied information is handled with utmost discretion. Your responses will not be combined with any reported findings along with your names. All information submitted will be treated with utmost confidentiality. Kindly express your opinions with utmost honesty. Thank you.

Instructions

Please don't append your name on the questionnaire. Please respond to all questions and mark the appropriate box by ticking (√)

PART A: Background Information of Respondent

1. Company Name……
2. Which profession body do you belong to?

   KISM [ ] ICPAK [ ]

   Any Other (Specify) ……
3. How long have you worked in the present firm?

   0-3years [ ] 3-6 years [ ] 6-9 years [ ] 9-12years [ ]

   12-15years [ ] 15-18years [ ] Above 18years [ ]

PART B: Information sharing practices on performance of food processing firms

The following are items in intended to assess the effects of information sharing practices on performance of food processing firms. Please tick (√) where appropriate.

1- Strongly disagree, 2- Disagree, 3- Neutral, 4 – Agree, 5 – Strongly agree

Statement	**1**	**2**	**3**	**4**	**5**	
Our firm has developed an information sharing policy						
Our information sharing policy guides on the information to be shared within the firm						
Our information sharing policy guides on the information sharing outside the our firms						
Integrated information system has helped to improve the performance of our firm						
Our firm do generate data that can be shared across the supply chain as need arises						

Our firm has agreed on templates for sharing all necessary data						

PART C: Logistics management on competitiveness of food processing firms

The following are items in intended to determine the effects of logistics management on performance of food processing firms. Please tick (√) where appropriate. 1- Strongly disagree, 2- Disagree, 3- Neutral, 4 – Agree, 5 – Strongly agree

Statements	**1**	**2**	**3**	**4**	**5**
Our logistics system has been designed to cater for vehicle scheduling					
Vehicle scheduling in logistics management enable us to make all necessary improvements					
Our firm do have a predefined routing of the supplies					
Our routing system takes care of all the required flows in the supply chain					
Our firm logistics design has helped to reduced cost					
Our firm has established coordination points in the supply chain to improve vehicle scheduling					

PART D: Inventory management on performance of food processing firms

The following are items in intended to determine the effects of inventory management on performance of food processing firms. Please tick (√) where appropriate. 1- Strongly disagree, 2- Disagree, 3- Neutral, 4 – Agree, 5 – Strongly agree

Statements	**1**	**2**	**3**	**4**	**5**
Our firm has a well-established way of monitoring stock levels within the firm					
Our firm do timely relays of stock levels information					
Our firm always manages to reorder on time					
Our reordering system is well automated					
Our firm has adequate quality control within the supply chain					
Our firm has quality monitoring points within the supply chain					

PART F: Performance of Food Processing Firms in Nairobi County in terms of Operation Efficiency

The following are items in intended to examine the performance of food processing firms. Please tick (√) where appropriate. 1- Strongly disagree, 2- Disagree, 3- Neutral, 4 – Agree, 5 – Strongly agree

Statements	**1**	**2**	**3**	**4**	**5**
Our revenue performance has been improving in the last five years					
Our delivery times have significantly improved					

Most of our products are absorbed by the markets in good time					
Our firm has reduced the levels of redundant costs					
There has been cost reduction as a result of inventory management					
There has been cost reduction as a result of proper information sharing					
There has been cost reduction as a result of logistic design					
Maximum utilization of resources as a result of proper information sharing					
Maximum utilization of resources as a result of inventory management					
Maximum utilization of resources as a result of logistics management					

PART G: Firm Size on SCMPs and Performance of Food Processing Firms

The following is an item intended to assess the moderating effect of firm size on the relationship between supply chain management practices and performance of food processing firms in Nairobi County. Please tick (√) where appropriate

What are the total number of employees in your firm?

1. 100 and above [ ] 2.50-99 [ ] 3. 10-49 [ ]

Thank you very much for your cooperation

Appendix III: List of Food Processing Firms in Nairobi, Kenya

1. Valentile Cake House	58. Home Oil Ltd	115. Mombasa Maize Millers (Nairobi) Ltd
2. C. Czamikow Sugar E.A Ltd	59. Candy Kenya Ltd	116. Confec Industires Ltd
3. America Bottling Co. Ltd	60. Proctor & Allan E.A	117. Global Fresh Ltd
4. Cakes And Muffin House Ltd	61. Spin Knit Dairy Ltd	118. Pembe Flour Mills Ltd
5. East Africa Food Ltd Premier Cookies Ltd	62. Aquamis Ltd	119. Corn Products Kenys Ltd
6. Belfast Millers Eastern Produce Kenya Ltd	63. UDV Kenya	120. Hail And Cotton Distillers Ltd
7. African Oasis Spring Water Ltd	64. Sunny Processor	121. Afribon (K) Limited
8. Bio Foods Ltd	65. Trufoods Ltd	122. Coca-Cola Juices (K) Ltd
9. Farmers Choice Ltd	66. Unga Group Ltd	123. Africa Spirits Ltd
10.Cadbury Kenya Ltd Breakfast Cereal Co. Ltd	67. Erdemann Co. Ltd	124. Contini Limited
11. Global Allied Industries Ltd	68. Alexandre Bakery And Pastry Ltd	125. Afrimac Nut Company
12. Coca Cola E.A Ltd	69. Galana Oil Kenya Ltd	126. Danone Baby Nutrition Africa
13. Aquamist Ltd	70. Chirag Kenya Ltd	127. Agriner Agricultural Development Overseas
14. Global Beverages Ltd	71. Kwality Candies	128. Al-Mahra Industries Ltd
15. Mombasa Maize Millers (Nairobi) Ltd	72. Brava Food Industries	129. DPL Festive Ltd
16. Confec Industries Ltd	73. Annum Trading Co. Ltd	130. Almasi Beverages Limited
17. Global Fresh Ltd	74. Art Caffee Coffee & Bakery Ltd	131. East African Breweries Ltd
18. Pembe Flour Mills Ltd	75. NAS Airport Services	132. Alpha Fine Foods Ltd
19. Corn Products Kenys Ltd	76. Promasidor Kenya	133. East African Sea Food Ltd
20. Hail And Cotton Distillers Ltd	77. Mafuko Industries	134. Alpha Grain Millers Limited
21. Pearl Industries Ltd	78. Nairobi Bottlers	135. East African Seed Co. Ltd
22. Crown Foods Ltd	79. Uzuri Foods Ltd	136. Alpine Coolers Ltd
23. Alpha Fine Foods Ltd	80. Rafiki Millers Ltd	137. Eastern Produce Kenya Ltd (Kakuzi)
24. Nestle Kenya Ltd	81. New Kenya Cooperative Creameries	138. Aquamist Ltd
25. Cake City Ltd	82. Value Pak Foods Ltd	139. Edible Oil Products
26. Alpine Coolers Ltd	83. Manji Food Industries Ltd	140. Aviano East Africa
27. Equator Bottlers Ltd	84. Malvin Marsha International	141. Elekea Limited
28. Baj Trading Ltd	85. W.E Tlly Muthaiga	142.Bakers Comer Ltd
29. Patco Industries	86. Cpice World Ltd	143.Elle Kenya Limited

30. Grange Park Mineral Water Ltd	87. Softa Bottling Co. Ltd	144. Bdelo Ltd Erdemann Co. (K) Ltd
31. Deepa Industries Monte Kenya Ltd	88. Kevian Kenya Ltd	145.Belfast Millers Ltd
32. Kenya Sweets Ltd	89. Kabasora Mill Ltd	146.Europack Industries Limited
33. Abardare Water Ltd	90. Nairobi Flour Mills Ltd	147. Bio Food Products Limited
34. Brookmhil Springs Water Ltd	91. Koba Waters Ltd	148.Farmers Choice Ltd
35. Highland Mineral Water Ltd	92. Razco Ltd	149.Breakfast Cereal Company (K) Ltd
36. Insta Products (EPZ) Ltd	93. Wringly Company E.A	150. Frigoken Ltd (Fonnerly Weetabix)
37. Giloil Co. Ltd	94. Smash Industries Ltd Mini Bakeries Nairobi Ltd	151. Fmtarom Kenya (Ltd)
38. Mariana Estates Ltd	95. Kapa Oil Ltd	152.Britania Foods Ltd
39. Highland Mineral Water Co.	96. Martini Kenya Ltd	153.Giloil Company Limited
40. Glacier Products Ltd	97. Uniliver E.A Ltd	154.Githunguri Dairy Fanners Co-operative
41. Aquapure Mineral Water Ltd	98. Nairobi Flour Mills Ltd	155.British American Tobacco Kenya
42. Pepsi Cola (EA) Ltd	99. Kirinyaga Flour Mills Ltd	156.Glacier Products Ltd
43. Donuts World Ltd	100. America Bottling Co. Ltd	157.Global Fresh Ltd
44. Jumbo Biscuits Ltd	101. Cakes And Muffin House Ltd	158.Bulto Foods Ltd
45. Alpine Coolers Ltd	102. East Africa Food Ltd	159.Ganas Best Ltd
46. Al Mandra I. Ltd	103. Premier Cookies Ltd	160. C. Dormans Ltd
47. Supa Bakery Ltd	104. Belfast Millers	161. Green Forest Foods Ltd
48. Brookeside Diary Ltd	105. Eastern Produce Kenya Ltd	162. C.Czarnikow Sugar(EA) Ltd
49. Bakers In (Nairobi) Cake Ltd	106. African Oasis Spring Water Ltd	163.Italian Gelati & Food Products Ltd
50. Highlands Canner	107. Bio Foods Ltd	164.Cadbury Kenya Ltd
51. Mini Bakeries (Nairobi) Ltd	108. Farmers Choice Ltd	165. Jambo East Africa Ltd
52. Palm House Dairies	109. Cadbury Kenya Ltd	166. Candy Kenya Ltd
53. Capell Industries	110. Breakfast Cereal Co. Ltd	167. Kamili Packers Ltd
54. Premier Foods Industries Ltd	111. Global Allied Industries Ltd	168.Capel Food Ingredients
55. Nicola Farms Ltd	112. Coca Cola E.A Ltd	169. Kedsta Investment Limited
56. Frenchmaid Bakery Ltd	113. Aquamist Ltd	170. Chirag Kenya Limited
57. Premier Flour Mills Ltd	114. Global Beverages Ltd	171. Kenafric Industries Limited
		172.Kenchic Ltd

Source: KAM (2019) band KRA (2017)

Appendix IV: Ethics Review Letter

CHUKA UNIVERSITY

Knowledge is Wealth ***(Sapientia divitia est)*** **Akili ni Mali**
CHUKA UNIVERSITY INSTITUTION ETHICS COMMITTEE
Telephones: 0612304004 P.O. Box 109 - 60400
Fax line: 020 2310302 Chuka

31st MARCH 2022

REF: **CUIERC/ NACOSTI 254**
TO: **Mayabi Peres Linda**
Dear Sir/madam

RE: Effects of supply chain management practices on performance of food processing firms in Nairobi County, Kenya

This is to inform you that *Chuka University IERC* ***has*** reviewed and approved your above research proposal. Your application approval number is *NACOSTI/NBC/AC-0812.* ***The*** approval period is31st March 2022 to 31st March 2023

This approval is subject to compliance with the following requirements;

i. Only approved documents including (informed consents, study instruments, MTA) will be used
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by *Chuka University IERC.*
iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to *Chuka University IERC* within 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affected the safety or welfare of study participants and others or affect the integrity of the research must be reported to *Chuka University IERC* within 72 hours
v. Clearance for export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to the expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of an executive summary report within 90 days upon completion of the study to *Chuka University IERC.*

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

Yours sincerely
Dr.Benjamin Kanga

SECRETARY

Appendix V: National Commission of Science, Technology and Innovation Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: 272945

Date of Issue: 18/April/2022

RESEARCH LICENSE

This is to Certify that Miss., LINDA PERES MAYABI of Chuka University, has been licensed to conduct research in Nairobi on the topic: EFFECT OF SUPPLY CHAIN MANAGEMENT PRACTICES ON PERFORMANCE OF FOOD PROCESSING FIRMS IN NAIROBI COUNTY, KENYA for the period ending : 18/April/2023.

License No: NACOSTI/P/22/16894

272945

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

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