

**EFFECT OF GREEN SUPPLY CHAIN MANAGEMENT PRACTICES ON
PERFORMANCE OF MANUFACTURING FIRMS IN NAIROBI COUNTY, KENYA**

BY

CHRISTINE BAHATI NYAKUNDI

**A Research Project Submitted to Graduate School in Partial Fulfilment of the
Requirements for the Award of the Degree of Master in Business Administration of
Egerton University**

EGERTON UNIVERSITY

APRIL 2017

DECLARATION AND RECOMMENDATION

Declaration

I declare that this research project is my original work and has not been submitted for examination in this or any other university, college or institution of higher learning other than Egerton University.

Signed

Date

Christine Bahati Nyakundi

CM16/0159/12

Recommendation

This Research project has been submitted for examination with my approval as the University Supervisor.

Signed.....

Date

Dr. Justus Tari

Department of Business Administration

Egerton University

Signed.....

Date

Ms. Lydia K. Mbura

Department of Business Administration

Egerton University

COPYRIGHT

© 2016 Christine B. Nyakundi

All rights reserved. No part of this project may be reproduced, stored in a retrieval system, transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, or translated in any language, without the prior written permission of the author or Egerton University on that behalf except in the case of brief quotations embodied in reviews, articles and research papers.

DEDICATION

This work is dedicated first to God who has given me strength, wisdom and direction from the beginning of this project to the end, to Him be the Glory. It is also dedicated to my family who have always given me continuous support and encouragement during my studies.

ACKNOWLEDGMENT

My special thanks to the Almighty God the provider of the knowledge and wisdom for seeing me through my studies.

I am highly indebted to Egerton University for providing valuable information and guidance which helped me in completing this task through various stages.

I wish to express my thanks to my supervisors Ms Lydia Kwamboka and Dr. J. Tari who were very supportive. Their professional advice, corrections, guidance and encouragement throughout the time of project writing is appreciated. I would also like to thank Dr. H. Kombo for his generous advice and support.

This project would have not been possible without the kind support and help of many individuals and organizations. I would like to extend my sincere thanks to all of them.

Finally, to my family, my husband Geoffrey Omwenga, my children Ian Minara and Stacy Mora for their sacrifices and moral support during the study period. Thank you and May God bless you. There are other people who assisted me in various ways, I am unable to mention all of them here, but I am sincerely grateful for the help and encouragement they offered to make the study a success.

ABSTRACT

In today's global turbulences and increasing competition, organisations cannot do well in isolation as collaborations between different organisations have become the major input in achieving organisational goals and objectives. Green Supply Chain Management (GSCM) refers to management of activities that attempts to improve the environmental performance of purchased inputs, or of the suppliers who provide them. The purpose of the study was to determine the effect of GSCM practices on the performance of manufacturing firms in Nairobi Kenya. The specific objectives included; to establish the effect of green purchasing, green reverse logistics, green marketing, and green risk management on the performance of manufacturing firms in Nairobi Kenya. This study was carried out through a cross sectional descriptive survey. The target population of this study constituted 453 manufacturing firms in Nairobi Kenya. The study sought information from 208 procurement officers whose roles fall on the supply chain. This study made use of questionnaires which contained both structured and non-structured questions. On the other hand, the study used descriptive and inferential statistics to analyse the quantitative data. This study utilized the SPSS software to perform regression analysis on the collected data. The study revealed that adoption of GSCM practices led to improved overall quality, there is more strategic focus on reverse logistics and that efficiency, accuracy and timeliness in reverse supply chains activities are a priority. The study findings also show that manufacturing firms are able to meet customer expectations which led to new relations across the supply chain. It was clear from the study findings that the primary driving force to green risk management is an urge to meeting regulations. In conclusion, there is increased percentage of environmental innovations and green purchasing can improve a firm's economic position. On the other hand, there is a reduction in the waste of resources and promotion of environmental innovation is achieved. As a result of green marketing, manufacturing firms are able to meet customer expectations which lead to new relations across the supply chain. It is recommended that managers should embrace GSCM practices because they are designed to help organizations analyze and improve each element in their operations, from the selection of suppliers through to sales and distribution. The government needs to ensure that there is continuing coordination between the different administrative levels to implement the green supply chain.

TABLE OF CONTENTS

DECLARATION AND RECOMMENDATION	ii
COPYRIGHT	iii
DEDICATION.....	iv
ACKNOWLEDGMENT	v
ABSTRACT.....	vi
LIST OF FIGURES	x
LIST OF TABLES	xi
LIST OF ABBREVIATIONS	xii
CHAPTER ONE: INTRODUCTION	1
1.1 Background to the Study.....	1
1.1.1 The Manufacturing Sector in Kenya.....	4
1.2 Statement of the Problem.....	6
1.3 Research Objectives.....	7
1.4 Research Hypotheses	8
1.5 Justification of the Study	8
1.6 Scope of the Study	9
1.7 Limitations of the Study.....	9
1.8 Operational Definition of Terms.....	10
CHAPTER TWO: LITERATURE REVIEW.....	12
2.1 Introduction.....	12
2.2 Theoretical Perspective	12
2.3 Green Supply Chain Management Practices.....	15
2.4 Organizational Performance	17
2.5 Green Supply Chain Management Practices and Organizational Performance.....	17
2.5.1 Green Purchasing and Organizational Performance	18
2.5.2 Green Reverse Logistics and Organizational Performance	20
2.5.3 Green Marketing and Organizational Performance	22
2.5.4 Green Risk Management and Organizational Performance.....	24
2.5.5 Government Legislation and Organizational Performance.....	25
2.6 Research Gaps.....	25
2.7 Conceptual Framework.....	26

CHAPTER THREE: RESEARCH METHODOLOGY	29
3.1 Introduction.....	29
3.2 Research Design.....	29
3.3 Population of the Study.....	29
3.4 Sampling Technique and Sample Size.....	29
3.5 Data Collection	31
3.6 Pre-testing of the Data Collection Instruments	32
3.6.1 Reliability and Validity.....	32
3.7 Data Analysis and Presentation	33
CHAPTER FOUR: DATA ANALYSIS, PRESENTATION AND INTERPRETATION	34
4.1 Introduction.....	34
4.1.1 Response Rate.....	34
4.2 Demographic Information.....	35
4.2.1 Distribution of Respondents by Age.....	35
4.2.2 Level of Education.....	35
4.2.3 Number of Years in Service.....	36
4.2.4 Gender Distribution	37
4.3 Green Purchasing	38
4.4 Green Reverse Logistics	39
4.5 Green Marketing	41
4.6 Green Risk Management.....	43
4.7 Performance of Manufacturing Firms.....	44
4.8 Test of Hypotheses.....	45
4.8.1 Green Purchasing and Performance of Manufacturing Firms	45
4.8.2 Green Reverse Logistics and Performance of Manufacturing Firms.....	46
4.8.3 Green Marketing and Performance of Manufacturing Firms	47
4.8.4 Green Risk Management and Performance of Manufacturing Firms	48
4.9 GSCM Practices and Performance of Manufacturing Firms	49
CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS.....	51
5.1 Introduction.....	51
5.2 Summary of the Findings.....	51
5.3 Conclusions.....	54

5.4 Recommendations of the Study	55
5.4.1 Recommendations for Policy and Practice	55
5.4.2 Recommendations for Further Studies.....	56
REFERENCES.....	57
APPENDICES	64
Appendix I : Questionnaire.....	64
Appendix II: Manufacturing Firms in Nairobi County	68

LIST OF FIGURES

Figure 2.1: Conceptual Framework	27
Figure 4. 1: Distribution of Respondents by Age	35
Figure 4. 2: Level of education	36
Figure 4. 3: Number of years in service.....	37
Figure 4. 4: Gender distribution.....	37

LIST OF TABLES

Table 3.1: Population and Sample by Sector	31
Table 3. 2: Reliability Analysis	32
Table 4.1: Response Rate.....	34
Table 4.2: Distribution of Green Purchasing	38
Table 4.3: Distribution of Reverse Logistics.....	40
Table 4.4: Distribution of Green Marketing	42
Table 4.5: Distribution of Green Risk Management.....	43
Table 4.6: Distribution of Organizational Performance	44
Table 4.7: Effect of green purchasing on Performance of manufacturing firms in Nairobi	45
Table 4.8: Effect of Green reverse logistics on Performance of manufacturing firms	46
Table 4.9: Relationship between green marketing and performance of manufacturing firms.	47
Table 4.10: Relationship between Green risk management and performance of manufacturing firms in Nairobi.....	48
Table 4.11: Model Summary	49
Table 4.12: ANOVA Results	49
Table 4.13: Coefficients.....	50

LIST OF ABBREVIATIONS

AGOA	African Growth Opportunity Act
COMESA	Common Market for Eastern and Southern Africa
CSR	Corporate Social Responsibility
EPZ	Export Processing Zones
GDP	Gross Domestic Product
GoK	Government of Kenya
GSCM	Green Supply Chain Management
HRM	Human Resource Management
ICT	Information and communications technology
JIT	Just in Time
MNCs	Multinational Corporations
SCM	Supply Chain Management

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

In today's global turbulences and increasing competition organisations cannot do well in isolation as collaborations between different organisations have become the major input in achieving organisational goals and objectives. Supply Chain Management (SCM) was born in the manufacturing industry in the 1990's with the Just In Time (JIT) delivery system implemented in Toyota (Vrijhoef & Koskela, 2009). The main aim of SCM was reducing inventories and regulating suppliers' interaction with the production lines. Nevertheless, since its inception SCM has evolved into a full range of disciplines that involves closer customer-supplier relationships. The supply chain encompasses all activities associated with the flow and transformation of goods from raw materials (including extraction), through the end user, as well as information flows (Handfield & Nichols, 2009). Materials and information flows both up and down the supply chain. In other words, SCM can be defined as the integration of suppliers and customers into the decision-making processes, focusing on the planning, implementation and control of the logistics operations to pull materials through the supply chain (Kannan & Tan, 2005).

Green supply chain entails the use of recycled content products, energy efficient products and standby power devices, alternative fuel efficient vehicles, bio based products, non-ozone depleting substances and environmental protection, priority chemical and reduction of carbon dioxide emissions (source). Efficient production may be enhanced through suppliers' use of cleaner technologies, process innovation and waste reduction (Zhu & Sarkis, 2007).

Green Supply Chain Management (GSCM) refers to management of activities that attempts to improve the environmental performance of purchased inputs, or of the suppliers who provide them (Bowen et al., 2011). This is what gives rise to greening of product chains which in turn led to an emphasis on managing supply chains, an idea which was first postulated by Taylor (2005) in his argument that solutions to waste (environmental problem) would be found in the development of a new skill for purchasing.

Green et al., (2006) defines GSCM as the way in which innovation in supply chain management and industrial purchasing may be considered in the context of the environment. GSCM is a broader term than sustainable procurement (Bowen et al., 2001). However, this

concept is also related with GSCM practices and can be defined as the process whereby organizations meet their needs for goods, services, works and utilities in a way that achieves value for money on a whole-life basis in terms of generating benefits not only to the organization, but also to society and the economy, whilst minimizing damage to the environment (Purchasing & Supply Agency, 2006).

The supply chain processes influence the quantities and types of resources acquired and select the source of key products and suppliers. These activities are directly connected to the degree of negative impacts on the environment and indirectly connected with economic and social growth within a community (Morton et al., 2012). Conversely, GSCM is related with any attempt of improving the environmental performance of the purchased products/services or the suppliers that provide them (Bowen et al., 2001). The main aims of GSCM are to identify benefits, costs and risks associated with environmental performance (Hanfield et al., 2005). A typical starting point in considering the inclusion of the supply chain is by implementing ISO 14001, which recommends the inclusion of policies to ensure that the suppliers are aware of their environmental practices and liabilities (Rao, 2005). GSCM helps organizations look critically into the role played by each channel member in the effort to meet customer needs and at the same time meet desired environmental standards. Thus, it is not enough for a firm to be ISO14000 certified or to have NEMA certificate for the Kenyan situations, but there should be another practice for environmental sustainability (Environmental Management & Health, 2012).

The desired results of environmental performance according to Roberts (2008) is the process of minimizing the environmental impacts of ones' organization by controlling the aspects of the firms' operations that cause, or could cause, impacts to that environment. Thus, in order to meet the demand for environmental conscious products, the need for GSCM which incorporates green purchasing, green manufacturing and green marketing should be embraced as a corporate strategy (Burgess, 2007).

Environmental design has implications for industrial design of products, for example, solar-electric equipment, wind electricity generators or even innovative automobiles which would serve as alternatives for energy. A firm that employs GSCM will include in its decisions; screening of suppliers for environmental performance, working collaboratively with them on

green design initiatives and providing training and information to build suppliers environmental management capacity (Amemba, 2013).

Firm performance can be evaluated both environmentally and economically. In terms of environmental performance, Theyel (2011) identifies cleaner production, innovative approaches in design phase as well as environmental management and waste minimization as the possible benefits. In terms of economic performance, Zhu and Sarkis (2004) distinguish between positive and negative economic impacts. Positive economic impacts such as decreased costs of purchasing materials decrease in costs of energy consumption, decrease of waste treatment or decrease in fines for environmental accidents.

Finally, negative economic impacts such as investment in technology or training, increase of operational cost or increase of costs for purchasing environmentally friendly products, given the availability and relatively cheap costs of virgin materials in the construction industry. However, GSCM can be considered as a relatively new topic, so with current data sources and experiences it is difficult to assess if in practice GSCM is delivering better results to the companies involved (Zhu & Sarkis, 2004). The extent in which SMEs will respond to these requirements will depend on a case-by-case basis and the commercial benefit identified for these companies (Lamming & Hampson, 2006). This research study aims at determining the factors that influence the implementation of GSCM in manufacturing industries in Kenya.

Increasingly organizations in Africa in general and Kenya in particular have realized that environmental management is an important strategic issue to comply with mounting environmental regulations, to address the environmental concerns of their customers, and to enhance their competitiveness (Awino, 2007). In supply chain management, one of the most important corporate strategies related to environmental improvement is the adoption of green supply chain (GSC). The GSC strategy has become one of the most important initiatives for many organizations to achieve competitive advantages and corporate sustainable development. Much of the literature assumed that the GSC strategy adoption is only driven by rationalistic and deterministic orientation guided by economic and political goals. However, because supply chain management involves the cooperation and interaction among multiple stakeholders, the decision to adopt the GSC strategy may have more to do with the institutional environment in which a firm is situated (Burgess, 2007).

1.1.1 The Manufacturing Sector in Kenya

UNIDO (2012) and Awino (2007) point out that Kenya has the biggest formal manufacturing sector in East Africa and that this sector has grown over time both in terms of its contribution to the country's Gross Domestic Product (GDP) and employment. In terms of employment generation, the sector is estimated to employ an average of 13 per cent of the labour force in the Kenyan formal sector. Manufacturing is one of the key activities of the economy that accounts for about 10 per cent of the GDP. It is evident from this trend that the sector makes an important contribution to Kenya's economy (KAM, 2012). The average size of this sector for tropical Africa is 8 percent. Despite the importance and size of this sector in Kenya, it is still very small when compared to that of the industrialized nations (UNIDO, 2012; KIRDI, 2011). KAM (2012) statistics for Kenya's economic performance according to sector (Appendix III) show that the sector contributes to a lesser extent to the GDP as opposed to the other sectors, hence confirming UNIDO (2012) and KIRDI (2011).

The manufacturing sector contributes about 10 percent of the gross domestic product (GDP) (Economic Survey, 2013; UNIDO, 2012; Munyoki, 2007; KIRDI, 2009). During the year 2012, the manufacturing sector registered a growth rate of 3.1 percent which was a slower growth of 3.5 percent registered in 2011. The sector continued experiencing challenges that included high production costs, high costs of credit competition from imported goods and also uncertainties related to the 2013 general elections (Economic Survey, 2013). The total formal employment in the manufacturing sector increased by 2.3 per cent from 271.5 thousand persons in 2011 to stand at 277.9 thousand persons in 2012. The value of the output increased by 2.6 per cent to Kshs. 1,042.2 billion during the review period. Total value added on the other hand increased by 8.3 per cent from Kshs. 292.4 billion in 2011 to Kshs. 316.7 billion in 2012. Industrial credit to the sector increased from Kshs. 270.8 million to Kshs. 473.3 million (Economic Survey, 2013; UNIDO, 2012).

Further, Economic Survey (2012) shows that the overall sector posted mixed performance with majority of the sub-sectors showing positive growths. Key sub-sectors that registered positive growths included production of tobacco products; motor vehicles, trailers and semi-trailers, paper and paper products; basic pharmaceutical products; textiles; leather and related products; electrical equipment and machinery and equipment. The food industry which forms a major component of the sector registered a marginal decline. This was a result of reduced production of a number of products like processed milk and tea. Sales from Export

Processing Zones (EPZ) on the other hand rose by 12.0 per cent to Kshs. 47.5 billion in 2012 while capital investment in EPZ rose by 28.7 per cent to stand at 34.1 billion in 2012 (Economic Survey, 2013).

Kenya Association of Manufacturers (2012) and the Economic Survey, (2013), point out that the removal of price controls, foreign exchange controls and introduction of investment incentives have, however, not resulted in major changes in the overall economy. In particular, they have not improved the manufacturing performance. Therefore, it has been suggested that to build a self-sustaining industrial sector, it is necessary to establish strategic linkages within the domestic economy (Munyoki, 2007). Some efforts have to be made to promote strategic options among supply chains so as to enhance spread effects of industrial growth and to facilitate transfer of technology, skills and growth of small and medium scale sub-contractors (Awino, 2007; Kandie, 2009). Growth in the sector was, however, impeded by depressed domestic demand, increased oil prices and transport costs. Rising operating costs mainly as a result of higher power costs coupled with deteriorating road and rail networks further dampened growth in the sector. The growth in manufacturing sector was mainly attributed to the rise in output of the agro-processing industries. These included sugar, milk, grain milling, fish, tea, oils and fats processing sub-sectors. Other key sub-sectors of manufacturing that performed well in the 2009/2010 financial year were: manufacture of cigarette, cement production, battery (both motor vehicle and dry cells), motor vehicle assembly and production of galvanized sheets (KAM, 2009).

Awino (2007) and Kandie (2009) argue that, in 2005 the sector showed signs of recovery and that a growth of 2.7 percent in 2004 was recorded compared to 1.4 percent in 2003 (Economic Survey, 2005). The recovery is attributed to government imposing legislation to curb restructuring practices that disadvantaged local manufacturers and zero rating excise duty and related taxes. In addition, the African Growth Opportunity Act (AGOA) initiative and the Common Market for Eastern and Southern Africa (COMESA) trading arrangements continue to impact positively on the manufacturing sector (Economic Intelligent Unit, 2007). The sector grew by 6.9 percent in 2006 against 5.5 percent in 2005 and grew by 10 percent in 2007 (Economic Survey, 2010). The main components of this sector include food processing such as cereal milling, meat, dairy, sugar, fruits and vegetables; chemicals, beverages, tobacco, textile, paper, metal and electronic. The Manufacturing activities in Kenya are

mainly concentrated in the main urban centres of Nairobi, Thika, Mombasa, Nakuru, Eldoret and Kisumu due to good infrastructure and markets (Kandie, 2009; Economic Survey, 2008; KAM, 2009).

The manufacturing industry in Kenya can be classified under three main sectors, namely, the agro-based industrial sector, engineering and construction industrial sector and the chemical and mineral industrial sector (KAM, 2012; Awino, 2007; GOK Vision 2030). However, K'Obonyo and Odera, (1995) and K'Obonyo, (1999) categorize the three major classifications into two: agro-based and non-agro-based. The agro-based industrial sector had 45% of the firms in the industry while agro-based industrial sector contribute 55%. This study found that the agro-based industrial sector in Kenya consists of seven sub-sectors and provides the bulk (68 per cent) of value added from the manufacturing industry while the 32% was from the non-agro based industry. K'Obonyo (1999) argue that the agro-based industrial sector has developed on the basis of traditional domestic resource activities. The major challenges faced by this sector are related to the quantity, quality and price of raw materials mostly produced by small scale farmers (K'Obonyo & Odera, 1995; K'Obonyo, 1999). The seven sub-sectors that form the agro-based industrial sector are food processing, animal feeds, beverages and tobacco, miscellaneous food products, tanneries and leather products, woods and wood products and pulp and paper (Economic Survey, 2010; K'Obonyo and Odera, 1995; KAM, 2012; Awino, 2007; Kandie, 2009).

1.2 Statement of the Problem

The manufacturing industry is an important sector in Kenya as it makes a substantial contribution to the country's economic development (Economic Survey, 2013). Unfortunately, extractive and manufacturing firms have been cited as the leading culprits in environmental degradation since they are at the heart of the supply chain, as large volumes of products originate and flow through them. Thus, the concept of green GSCM is now gaining importance since it can help to minimize negative impact of the industrial processes while enhancing the competitive advantage of the manufacturing industries (Awino, 2007). Further, with an increasingly knowledgeable population, manufacturing companies are facing ever increasing demands for environmental accountability and quality products.

Various researchers have been done on this topic including Qinghua et al. (2007), who carried out a study on green supply chain management, pressures, practices and performance

within the Chinese automobile industry. Despite its increasing popularity in industrialized countries, GSCM is a relatively new concept in developing countries, Kenya included, although a number of manufacturing firms have already begun to implement these practices, as demonstrated by various green studies done locally (Amemba, 2013; Andebe, 2013). Preuss (2012) however observe that implementation of GSCM practices is more often in response to demand for environmentally sustainable products and services as well as to governmental environmental regulations. This observation concurs with Andebe's (2013) findings, which revealed that the textile industry in Kenya has adopted GSCM practices to a minimum extent and solely for compliance with the green regulation put forward by the government.

According to Korir (2014) green supply chain practices among manufacturing firms in Kenya are still in the early stages, lagging behind practices in developed countries. Most firms have not adopted it fully due to lack of awareness and lack of knowledge on the green supply chain management concept. The need for GSCM in Kenya calls for exploration considering the current state of affairs where the country has experienced a lot of environmental degradation due to unsustainable practices from manufacturing firms.

Although diverse literature suggests the many possible benefits of GSCM practises to firms, empirical work testing the relationship between GSCM and performance of manufacturing firms are scarce. While the above studies have touched on GSCM concept they were carried out in other countries and time has elapsed on their findings. It is also clear that there exists a knowledge gap that the current study would fill. This therefore, sets the stage for current study. Little has been done in Kenya on GSCM issues and it is in this regard that the current research sought to determine the effect of GSCM practices on the performance of manufacturing firms in Nairobi, Kenya.

1.3 Research Objectives

The overall objective of the study was to determine the effect of GSCM practices on the performance of manufacturing firms in Nairobi, Kenya. The specific objectives of this study were to:

- i. Determine the effect of green purchasing on the performance of manufacturing firms in Nairobi Kenya.

- ii. Determine the effect of green reverse logistics on the performance of manufacturing firms in Nairobi Kenya.
- iii. Determine the effect of green marketing on the performance of manufacturing firms in Nairobi Kenya.
- iv. Establish the effect of green risk management on the performance of manufacturing firms in Nairobi Kenya.
- v. Determine the combined effect of green purchasing, green reverse logistics, green marketing and green risk management practices on the performance of manufacturing firms in Nairobi Kenya.

1.4 Research Hypotheses

The studies sought to test the following hypotheses:

HA1 Green purchasing has a positive effect on the performance of manufacturing firms in Nairobi Kenya.

HA2 Green reverse logistics positively affects the performance of manufacturing firms in Nairobi Kenya.

HA3 Green marketing had a positive effect on the performance of manufacturing firms in Nairobi Kenya.

HA4 Green risk management affects the performance of manufacturing firms in Nairobi Kenya.

HA5 Green purchasing, green reverse logistics, green marketing and green risk management combined positively affect the performance of manufacturing firms in Nairobi Kenya.

1.5 Justification of the Study

The study intended to shed more light on GSCM practices by manufacturing firms and its effect on their performance. The results of this study could be used to reinforce the operations of manufacturing firms in relation to their products and the environment. It would show them how important it is to manufacture environmentally friendly products that can be recycled and not dangerous to the users of those products. This might also improve the image of manufacturing companies in the public's eye and help them be more prepared on the concept of GSCM practices. The findings of this study would help manufacturing firms' management in setting strategies that embrace GSCM in their operations which makes them have a competitive advantage on their competitors. This would in return help the industries

gain preference from their competitors hence more profitable and from possibilities of losing revenue.

The findings of this study might also be useful to consumers of manufactured goods on the selection of what to buy because of effects of harmful products. As well, the findings would be useful in informing the significance of Corporate Social Responsibility (CSR) of manufacturing firms by manufacturing environmentally friendly products. The study would assist consumers in their choice of green suppliers and their products and other benefits that may accrue from and environmentally guided decision. This study would help the formulate policies relating to green issues in the country. This study would be useful to scholars because it is expected to contribute their knowledge in the supply chain process. It would also be useful as a guide for further exploratory and confirmatory research into SCM practices in Kenya's chemical and mining firms.

1.6 Scope of the Study

This study was limited to an assessment of the effect of GSCM practices on the performance of manufacturing firms in Nairobi Kenya. This specifically focused on material sourcing, processing, packaging, storage and selling. The study covered 453 manufacturing firms in Nairobi and its environments targeting 208 officers whose roles fall on the supply chain. The study lasted for a period of six months.

1.7 Limitations of the Study

While this study was expected to produce critical findings, it did, however, have certain limitations. The study findings were limited to the sample size of the population selected. The research was conducted in manufacturing firms within Nairobi. As a result, it was doubtful whether or not the findings could be applied more broadly to other firms outside Nairobi. Another limitation was that the study was based on a cross-section survey, and the study contained the typical limitations associated with this kind of methodology (Inability to uncover the exact nature of the theoretical linkages being investigated). To access information from the organization and respondents targeted the researcher the respondents were not willing to engage in this study due to related reasons such as privacy and busy schedules at work place. However, the researcher liaised with the Human Resource Management (HRM) to facilitate the study. Another limitation was that some respondents

were unwilling to participate due to fear of victimization in the event the findings displayed a negative image of their organizations. However, the study emphasized that the research was purely academic and that the responses were treated with utmost confidentiality.

1.8 Operational Definition of Terms

Green Marketing: Refers to activities aimed at promoting the taking advantage of the changing consumer attitudes towards a brand. The firm's policies and practices influence the said changes affecting the quality of the environment and hence, reflect the level of its concern for community. Efforts companies use, including corporate social responsibility plans and sustainability efforts (Shane, 2013)

Green Purchase: Refers to the procurement of products and services that have a reduced effect on human health and environment when compared with competing products or services that serve the same purpose. It is also known as environmentally preferred purchasing (Rao, 2012).

Green Reverse Logistic: It is all operations related to the reuse of products and materials. It is the process of planning, implementing and controlling the efficient, cost effective flow of raw materials, in-process inventory, finished goods and related information from point of consumption to the point of origin for the purpose of recapturing value or proper disposal. It includes the management and the sale of surplus as well as returned equipment and machines (Preuss, 2005).

Green Risk Management: this is a way of managing the risks and capturing the opportunities associated with climate change and other environmental issues by identifying environmentally focused investments and risk mitigation strategies intended to enhance the risk-adjusted returns of the overall company portfolio (Min & Galle, 1997).

Supply Chain Management: This is defined as the integration of suppliers and customers into the decision-making processes, focusing on the planning, implementation and control of the logistics operations to pull materials through the supply chain (Mentzer, 2001).

Green Supply Chain Management: this refers to management of activities that attempts to improve the environmental performance of purchased inputs, or of the suppliers who provide them (Stonebraker& Liao, 2006).

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The literature reviewed various studies and theories in support of the adoption of GSCM by manufacturing chemical industries by exploring practices employed by organizations in an attempt to overcome environmental challenges.

2.2 Theoretical Perspective

This study is guided by stakeholder theory of organizational management and business ethics that addresses morals and values in managing an organization. It was originally detailed by Freeman (1994) in the book *Strategic Management: A Stakeholder Approach*, and identifies and models the groups which are stakeholders of a corporation, and both describes and recommends methods by which management can give due regard to the interests of those groups. In short, it attempts to address the “Principle of Who or What Really Counts.”

In the traditional view of the firm, the shareholder MH (Majority Holder) view (the only one recognized in business law in most countries), the shareholders or stockholders are the owners of the company, and the firm has a binding fiduciary duty to put their needs first, to increase value for them. In older input-output models of the corporation, the firm converts the inputs of investors, employees, and suppliers into usable (salable) outputs which customers buy, thereby returning some capital benefit to the firm. By this model, firms only address the needs and wishes of those four parties: investors, employees, suppliers, and customers. However, stakeholder theory argues that there are other parties involved, including governmental bodies, political groups, trade associations, trade unions, communities, associated corporations, prospective employees, prospective customers, and the public at large. Sometimes even competitors are counted as stakeholders.

The stakeholder view of strategy is an instrumental theory of the corporation, integrating both the resource-based view as well as the market-based view, and adding a socio-political level. This view of the firm is used to define the specific stakeholders of a corporation (the normative theory (Donaldson) of stakeholder identification) as well as examine the conditions under which these parties should be treated as stakeholders (the descriptive theory of stakeholder salience). These two questions make up the modern treatment of Stakeholder Theory (Hassan, 2013).

There have been numerous articles and books written on stakeholder theory. Recent scholarly works on the topic of stakeholder theory that exemplify research and theorizing in this area include Donaldson and Preston and Mitchell, Agle and Wood (2007), Friedman and Miles (2002) and Phillips (2003).

Donaldson and Preston (2003) argue that the normative base of the theory, including the identification of moral or philosophical guidelines for the operation and management of the corporation, is the core of the theory. Mitchell et al.,(2007) derive a typology of stakeholders based on the attributes of power (the extent a party has means to impose its will in a relationship), legitimacy (socially accepted and expected structures or behaviors), and urgency (time sensitivity or criticality of the stakeholder's claims).

The political philosopher Charles Blattberg has criticized stakeholder theory for assuming that the interests of the various stakeholders can be, at best, compromised or balanced against each other. Blattberg argues that this is a product of its emphasis on negotiation as the chief mode of dialogue for dealing with conflicts between stakeholder interests. GSCM is increasingly becoming critical for success in manufacturing industries. Yet, like the management of any other input, process and output, SCM requires configuration with business strategy and structure, without which the organization is unlikely to be competitive. The stakeholder theory will be important for this study because the theory emphasises on organizational management and business ethics that addresses morals and values in managing an organization.

The theoretical underpinnings for this study are grounded in the coordination-theoretic perspective in SCM. Research has separately investigated internal and external characteristics when investigating the supply chain and inter-organizational performance (Wong et al., 2009). In a survey of 100 randomly selected supply chain management research articles, it was found that inter-organizational construct investigations were well represented in the literature, but studies in intra-organizational construct relationships and SCM were the subject of 'very few studies' (Burgess, 2007, Singh et al.,2007). Only one publication was found that investigated both inter-and intra-organizational constructs (McAdam & Brown, 2001).

Coordination theory argues that enterprises should integrate activities along their supply chain (Malone & Crowston, 1994). Coordination theory states that dependencies exist among

activities and need to be managed properly. The theory has been used to analyze inter-organizational dependencies (Gosain et al., 2004), coordination of product information in the supply chain (Legner & Schemm, 2008), and bundling of digitized logistics activities (Lai et al., 2010). Organizational practices such as GSCM are coordinated through the networks of communications and relationships that exist among organizational actors, and the strength of those networks predicts superior performance (Shah et al., 2008).

In the 1990's, strategic supply chain management grew out of the recognition that increased reliance on improved relationships, collaborations, and information exchange with supply chain partners (Gunasekaran et al., 2008), was needed with the aim to operate as cooperative value chains rather than as independent organizations seeking individualized pecuniary goals (Koufteros et al., 2007). Both internal and external organizational changes were required for successful supply chain management (Lai & Cheng, 2009). Greater cooperation and coordination across the supply chain, both intra- and inter-organizational, through long-term and strategic relationships have led to improved financial and organizational performance (da Silveira and Arkader 2007, Lai et al., 2005).

Investigation of internal and external coordinating mechanisms collectively amongst organizational and inter-organizational networks has rarely been studied. External cooperation amongst organizations may not provide significant performance nor be successful without proper internal cooperation. It has been found that manufacturers with well-developed internal and external interfaces perform better than their counter parts only with sound internal interfaces (Koufteros et al., 2005). Innovation (GSCM practices can be viewed as environmental organizational innovations) is typically an outcome of interaction between a firm and various outside entities (Yeung et al., 2007). Both, internal and external issues and relationships come into play in this type of innovation development (Yeung et al., 2007).

Although both intra- and inter-organizational coordination are researched in the management literature, they are typically addressed using distinct analytical frameworks. Organization design, extended from internal units to external organizations, can strengthen inter-organizational coordination networks and align them with those for intra-organizational coordination (Mota & de Castro, 2004). Failure to carefully coordinate between the inter- and intra-organizational levels can cause poor performance as well as high coordination cost (e.g.,

delay, re-handling). Organizational change without considering the dependency among the coordination elements can lead to inferior performance than the expected outcomes.

The impact of external relationships with suppliers and customers on performance is often mediated by internal coordination (Wong et al., 2009). This one way relationship was extended to and investigated as a possible two way mediation between customer coordination investments, supplier coordination investments, and delivery performance (da Silveira & Arkader, 2007). Such two-way mediation theoretical supposition argues that the relationship between customer coordination investments and delivery performance were mediated by supplier coordination investments, and that the relationship between supplier coordination investments and delivery performance were mediated by customer coordination investments. These supply chain mediation investigations focused on external investments and coordination. None considered the joint internal coordination mechanisms and their relationships to external mechanisms.

It has been found that manufacturers with well-developed internal and external interfaces perform better than their counter parts only with sound internal interfaces. Innovation GSCM practices can be viewed as environmental organizational innovations thus typically an outcome of interaction between a firm and various outside entities. This being the case the current study will benefit from this theory for coordinated networks of communications and relationships that exist among organizational actors, and the strength of those networks predicts superior performance by the firm.

2.3 Green Supply Chain Management Practices

According to Azzorne et al. (2007), environmental practices within profit organizations may be considered as a set of guidelines that the firm define to respond to the current internal and/or external pressures and /or to anticipate future evolution of the competitive environment, of regulators and of the customer's needs. Thus each firm according to its own strategic orientation decides whether to include environmental factors into the overall process of strategy formation. Consequently the company's environmental strategies, which depends on the company's history, the fields where it operates and the country in which it has the headquarters or it plants.

Pun (2006) posits that there are various tools and methods practitioners and researchers use to implement environmentally responsible operations with environmental management in

industry. The tools and methods were developed to help understand what and how to address environmental concerns and for practitioners to identify opportunities and translate understandings into unambiguous strategies directed to improve and sustain eco-performance of products and operations. Some of them include green supply chain (which is the main area of concern in this study), green purchasing, life cycle assessment, green quality function deployment and recycling and remanufacturing.

Green et al. (2008) indicated that GSC is a method to design and/or redesign the supply chain that incorporates recycling and remanufacturing into the production process and it involves minimization of the firm's total environmental impact from start of the supply chain and also from beginning to end of the product life cycle.

The Brundtland Report 'Our Common Future' (WCED, 2007) clearly spelled out that sustainable development would only be achieved if society in general, and industry in particular, learned to produce more goods and services with less of the world's resources (including energy) and less pollution and waste (White et al., 2005). Further research by Octavio BarrerioTrigos (2007) established the adoption of Green Supply Management and the performance of companies in the construction industry in the United Kingdom. Octavio BarrerioTrigos found that companies that had embraced GSCM in their operations were found to perform better than those which had not (source). He concluded that the adoption of GSCM by a company is more likely to generate benefits to it.

Harris (2012) observed that green organizational culture values upon which firms may be positioned include; the need for firms to incorporate environmental considerations throughout the entire organization, such concerns should be considered throughout the value chain, economic goals should be tempered, spirituality, morality, smallness and futurity should be embraced and the environment should be afforded intrinsic valuation and respect. The U.S environmental protection agency for example offers assistance within their green supplier's network- aiming at suppliers and manufacturers to help them eliminate waste, save money and reduce their eco-impact. Thus, the increasing consciousness of sustainable development and reconciling of production with ecosystem conservation have fostered the adoption and implementation of GSCM (Pun et al., 2012).

2.4 Organizational Performance

The key operational variables for performance evaluation are sales and profitability. The extent to which you achieved the sales volume predicted in your planning and how it changes in your sales volume as compared to the changes at your competitors are the accurate measures of Organizational Performance. The percent profit margin indicates how much of each dollar earned from sales your company keeps as profit and is a good indicator of overall performance. The business world will always require management to be creative in an effort to improve their performance; they should have the ability and can take advantage of any opportunities to improve Organizational Performance. It is important to improve the Organizational Performance is to create strategies, techniques and business tools are appropriate and suitable for the company. Accounting statements provide different measurements to measure the firm performance, such as net income, return on assets or return on equity. The firm performance as a barometer of the success of the company will be seen as a benchmark for investors to invest their funds. High the firm performance will push the company's stock market price increases, as investors will respond positively as a signal to invest funds (Murphy, 2003).

2.5 Green Supply Chain Management Practices and Organizational Performance

Green Supply Chain Management (GSCM) is a kind of sustainable strategic development for enterprises in today's competitive workplace, which has emerged as a new innovative approach to achieve both financial and environmental benefits simultaneously, by reducing environmental risk and impact (Vrijhoef & Koskela, 2009). Due to increasing flow of environmental degradation in recent decades, organizations have been forced to pay more attention to their ecological footprint by changing their strategic viewpoints and adopting green initiatives in their production line. With increasing competition in today's global market, the firms have to look to the modern strategic manners, in order to gain sustainable organization and competitive advantage.

GSCM is a highly important element of organizational success. The economic growth increases the level of energy and material consumption, which contribute to the environmental issues and resource depletion problems. It has become increasingly significant for organizations facing competitive, regulatory, and community pressures to balance economic and environmental performance. Nowadays, most organizations are starting to go

green in their business as a concern to environmental sustainability. They have realized the greater benefit of the green technology adoption in business operation, which also affect suppliers and customers (Morton et al., 2012). This section will focus on the effect of green purchasing, green reverse logistics, green marketing and green risk management practices on the performance of manufacturing firms.

2.5.1 Green Purchasing and Organizational Performance

Green purchasing is defining as environmentally conscious purchasing practice that reduces sources of waste and promotes recycling and reclamation of purchased materials without adversely affecting performance requirements of such materials (Pun, 2006). It is being argued that purchasing professionals in the buying firms need to understand their recycling policy involving collection, separation, storage, transportation, reprocessing, and remanufacturing as part of supplier selection procession which ultimately affects performance of the organisation (Min & Galle, 2006). From an environmental lifecycle and quality perspective, it is important to consider the sources of materials from which products are made. From the inbound perspective of the supply chain it is argued that greening the supply chain has numerous benefits to an organization, ranging from cost reduction, to integrating suppliers in a participative decision-making process that promotes environmental innovation (Rao, 2012). This is to say that a large part of the inbound function essentially comprises of green purchasing strategies adopted by organizations in response to the increasing global concerns of environmental sustainability.

Purchasing activity is the key starting point of eliminating waste, so a key factor of the successful green purchasing is the condition of company recycling and reusing waste. Hokey et al., (2001) proposed that reducing the emissions of exhaust and sewage and so on, not only is the premise of ensuring the implementation of green procurement system, but also is the important way to promote the development of green procurement. The type of companies' resources can influence both the purchasing practice, the technology, equipment and facilities of separating waste can impact the purchasing practice. Stock (1992) thought that green purchasing can improve a firm's economic position, by reducing disposal and liability costs, conserving resources, and improving an organization's public image. Min and Galle, (2001) found that the two most highly rated obstacles to effective implementing green purchasing was cost and revenue. In the process of implementing green procurement, the enterprise is

bound to increase investment, training staff costs and the communication costs with suppliers which hence cause the loss of other investment opportunities (Liu, 2009).

Qinghai et al. (2004) found the suppliers stress had greater impact on the implementation of green supply chain through research. Hou (2007) pointed out that the close cooperation of suppliers and buyers would promote the successful completion of green purchasing activities. Carter et al. (1996) defined green purchasing as: in order to facilitate reusing and recycling resource reduction, the purchasing department should participate in every activity of supply chain management and should more concretely purchase reused, recycled materials so as to reduce the use of resources as much as possible. Zsidisin and Siferd defined that green purchasing is a set of principles, methods under premise of full considering the impact on the environment. Qinghua et al. (2002) considered green purchasing as: every department in the enterprise consults decision-making to improve business performance by decreasing the using materials cost and end treatment cost, protecting resources and enhancing the enterprise reputation, among others.

Turner (2010) pointed out the potential aim of green procurement is to eliminate waste, and purchasing department will focus on value by comprehensive considering the total cost in the process of eliminating waste, which should focus on the business of waste disposal activities. Usually, it can save more cost in the source of supply chain to prevent waste than at the end of supply chain. The availability, characteristics, knowledge, ambitions, equipment and actions of the suppliers can have an impact on purchasing (Knudsen, 2003) and green purchasing. To achieve an effective environmental performance, the purchaser must take, and be given, the responsibility and resources for educating suppliers and demonstrate ongoing commitment (Murray, 2000).

Drumwright (1994) classified the enterprise according to the company leader's different view on environment responsibility through the research of 10 enterprises, provided a framework for the design of business organizational structure and the implementation of green procurement, and but also found the environmental awareness of senior leaders had a great influence on the success of the enterprise green purchasing. The relationship formed with customers described in terms of communication patterns, cooperation and dependency is addressed in the purchasing literature, and in the environmental purchasing literature. Carter et al (1998) describe customers as having a direct impact on firms' environmental purchasing

activities and Walker et al (2008) investigates how customers' influence drives green supply chain management. The priorities of the customers can influence the environmental management and environmental purchasing.

Companies can greatly improve business performance by working with suppliers, shippers, distributors, and customers to better coordinate logistics activities. Green purchasing enables better compliance with existing norms, improvement of brand image for consumers and better ranking by non-financial notation organizations. Large and Thomsen (2011) study on drivers of GSCM Performance found that the degree of green supplier assessment and green collaboration has direct influence on environmental performance.

Zhu and Sarkis (2011) further observed that under rigorous green purchasing quality control, organizations can improve their environmental practice by learning from experiences of their quality management programs. By receiving "green" certificates such as the ISO series of environmental management systems and standards, organizations are able to create structured mechanisms for continuous improvement in environmental performance.

2.5.2 Green Reverse Logistics and Organizational Performance

According to Preuss (2005), the link between supply chain management and environmental protection also needs to be considered from the opposite perspective. Whereas design for environment technique is dependent on the availability of materials and technical capabilities of the supply chain, product take-up requires well-honed logistics operations. Managing the reverse flow of product is an important ability for any company, since the product lifecycle offers a valuable source of insight about the changing needs of marketing and logistics over the life of a product. Recycling is a technique that is used to reduce the solid waste stream volume, though the reverse logistics channels used seem to have received minimal attention (Lembke, 2012).

Efficiency, accuracy and timeliness in reverse supply chains activities are a priority for leading manufacturers (www.suppl-chainservices.com). Products that are traded –in are usually of value. Failure to address the reverse supply chain can lead to lost revenues and additional expenses. Helms (2012) asserts that, with all the attention to the forward action of the supply chain, manufacturers are now considering how this supply chain can work in reverse to reclaim products at the end of their life cycle and return them through the supply chain for decomposition, disposal, or re-use of key components. Strategic factors to consider in

reverse logistics include costs, overall quality, customer service, environmental concerns and legislative concerns.

More companies have increasingly altered their company policies with more strategic focus on reverse logistics (Janse et al., 2009). Reverse logistics has played an increasingly critical role in overall corporate business (Daugherty et al., 2002) and been examined strategically within broader supply chain strategy. The more powerful customers, the increasing multichannel retailers, and the growing enforcement of laws have direct impacts on the movement of goods throughout supply chain of European electronics industry, and particularly on the reverse flows (Verweij et al., 2008). Reverse logistics activities require adequate knowledge management in all phases of returning the product to help solve the problems it faces in these processes (Wadhwa & Madaan, 2007). In this sense, it will be essential for the organization to have the ability to generate new knowledge to reduce the high uncertainty of reverse logistics activities (Arrow, 1962; Galbraith & Kazanjian, 1986) giving it greater flexibility to expand its capacity to respond to the continuous changes that occur in these activities.

Reverse Logistics is the opposite of traditional or forward logistics (Beamon, 1999). Dowlatshahi (2000) and Carter and Ellram (1998) define reverse logistics as a process where a manufacturer accepts previously shipped products from the point for consumption for possible recycling and re-manufacturing. Sorting and Recycling are also an important mechanism when sorting reusable products. Cairncross (1992) and Srivastava (2007) suggest that collection schemes should be classified according to materials whether separated by the consumer (separation at source) or centralized (mixed waste). The goal is to sort products that can be reused to reduce costs of making new products.

The importance of reverse logistics programmes and the process of their development and implementation have also been described in the literature (Poist, 2000). Redesigning logistics networks to accommodate product returns and remanufacturing and re-use of such parts and components can often be profitable (Tibben- Lembke, 2002). The physical location of facilities and transportation links need to be chosen to convey used products from their former users to a producer and to future markets again to enhance efficiency and performance (Fleischmann et al., 2001).

Companies need to realize the hidden value in reverse logistics and start to focus in this area (Mollenkopf & Closs, 2005). They need to understand the financial impact of reverse logistics strategies. Srivastava and Srivastava (2005) develop a hierarchical decision-making framework to find the feasibility of profit-driven reverse logistics networks. They find reverse logistics activities profitable for their select category of products. Nowadays, information and communication technologies (ICT) are likely to play a key role in the coordination and integration of GSCM activities (Dekker et al., 2004). Problems related to the integration of reverse logistics activities within an organization have been dealt by Chouinard et al. (2005), while Daugherty et al. (2002) find that resource commitment to information technology leads to superior reverse logistics which subsequently improve performance.

2.5.3 Green Marketing and Organizational Performance

Green marketing supports green manufacturing since it is customer or demand focused as opposed to product oriented manufacturing strategy. Through green marketing initiatives firms are able to develop their own positive efforts to be more socially responsible and to meet customer expectations for more environmentally conscious products (Shane, 2013). According to Iles (2006), chemical manufacturers can green chemistry as a sustainable tool to reduce toxicity, resource and energy use, and pollution of chemicals. To market green chemistry companies, need to generate more information internally, build new relations across the supply chain and provide more information externally.

Without green marketing initiatives, manufacturers of products that have negative impact on the health of the consumers, like tobacco and beer would render such producers out of business since even the adverts are restricted and retail prices are regulated by the government. For Kenyan East, African Breweries and BAT are some of the most profitable firms in the country despite the challenges. Thus, green marketing may be viewed as a means by which producers respond in meeting the requirements to become a sustainable market with the potential to grow and gain competitive advantage.

Fox (2007) argues that firms are recognizing that outputs from the production process should be viewed under scrutiny of climate change as well. Savvy management recognizes that everything coming out of a production facility is a product, by-product, or waste. Green products are recognized nationally or internationally through certification and eco-labeling. They conclude that business firms need to change their mind set from traditional marketing

practices to green marketing practices with a huge investment in technology, R and D and through Green marketing elements such as eco-design of a product, eco-labeling, eco-packaging, green logo in order to survive in the green competitive world and to have a positive impact on the environment.

According to Ottaman (1993) and Ken Peattie (1993), the concept of green marketing is in and the concept of conventional marketing is out. Azhagaiah and Ilangovan (2006) found out that the environmental issues have a significant impact on the modern society and observed the impact of green marketing and the environment protection. Thakur (2009) in his study on customer awareness with reference to green marketing of automobiles concluded that green marketing of automobiles is attracting both from urban and rural people. This clearly indicates that people are shifting to the eco-friendly products to have a positive impact on the natural environment rather than traditional products. Welling and Chavan (2010), while analyzing the feasibility of green marketing in small and medium enterprises in Suburban Mumbai, concluded that both the State and Central governments should take necessary steps and encourage the SME`s to manufacture green products.

Brady (2010) argues that due to the diminishing availability of natural resources, such as water, oil, this green interest is also creating a concern for conservation. With the viability of the planet a growing concern many consumers are willing to do their part. Ramakrishna (2012), in his study on green marketing in India, the researcher analysed the eco-issues in green marketing through the 4p`s of green marketing mix and concluded that awareness to be created among the people about green marketing benefits and eco-friendly products and also concluded that the firms need to give more attention towards the green culture in order to survive in the tough market.

According to Hall (2003), greening the marketing process has numerous benefits to an organization, ranging from cost reduction, to integrating suppliers in a participative decision-making process that promotes environmental innovation. Korir (2014) study on green supply chain implementation practices and supply chain performance of battery manufacturing firms in Kenya found that that green marketing practices are important in the supply chain performance. Likewise, Chege (2012) study on green supply chain management practices and performance of private hospitals in Nairobi, Kenya found that green marketing practices revealed a significantly positive relationship with the performance parameters. Since GSCM

practices affected performance in this regard, implementing GSCM practices improves organizations' capacity to handle the supply chain disruption.

2.5.4 Green Risk Management and Organizational Performance

Walton et al. (1998), examined the integration of supply chain risk management team into environmental management processes, and observed two evolving trends. They firstly suggest that environmental issues are becoming an intrinsic part of supply chain risk management as it is in strategic planning in organisations due to stricter regulations and the demands of environmental accountability. They also observe a second trend amongst their case examples, that organisations are integrating their supply chains risk management department to reduce operating costs and improve their customer service.

The concepts pertaining to supply chain environmental management (SCEM) or greening the supply chain are usually understood by industry as screening suppliers for environmental performance and then doing business with only those that meet regulatory standards through effective supply chain risk management practices (2002). The driving forces for introducing and implementing the concept into the company operations are numerous and comprise a range of reactive regulatory reasons to proactive strategies and competitive advantage reasons. Approaches such as cleaner production, environmental management systems and eco-efficiency have been implemented for green management practices. The factors driving the competitive advantage through environmental performance have been identified as market expectations, risk management, regulatory compliance and business efficiency.

Min and Galle (1997) conducted an empirical survey of US risk management managers with regard to green supply chain risk management and have found that that the primary driving force to green risk management is an urge to meeting regulations rather than environmental monitoring or partner- ships. The effectiveness of green purchasing also depends on whether the firm has centralised or decentralised decision-making, which determines the extent of flexibility in the green purchasing process. Environmentally sustainable (green) supply chain management (GSCM) has emerged as an important organizational philosophy to achieve corporate profit and market share objectives by reducing environmental risks and impacts while improving ecological efficiency of these organizations and their partners (van Hock & Erasmus, 2000).

Stevens (2002) demonstrated the benefits of green risk management to different roles of supply chain including environment and society in terms of different categories: material, immaterial, and emotion. For material, green risk management helps lower environmental load for environment, lower cost prices for supplier, lower cost for producer, lower cost for ownership for customer, and less consumption of resources for society. In terms of immaterial, green risk management helps overcome prejudice and cynicism for environment, less rejects for supplier, easier to manufacture for producer, convenience and fun for customer, and better compliance for society. For emotion, green risk management helps motivation of stakeholder for environment, better image for supplier and producer, feel good and quality of life for customer, and make industry on the right track for society

2.5.5 Government Legislation and Organizational Performance

Government legislation is law which has been promulgated by a legislature or other governing body or the process of making it. Before an item of legislation becomes law it may be known as a bill, and may be broadly referred to as legislation, while it remains under consideration to distinguish it from other business. Legislation can have many purposes: to regulate, to authorize, to proscribe, to provide (funds), to sanction, to grant, to declare or to restrict. It may be contrasted with a non-legislative act which is adopted by an executive or administrative body under the authority of a legislative act or for implementing a legislative act (Wim, 2009).

According to Wim (2009), the policy and legislative actions of any government, at national, state, and local levels, have significant impacts on the management and how various industries operate. Some of these impacts do not arise through actions directed toward the individual industry itself, but through actions directed toward associated or competing industries, such as agriculture, tourism, or recreation. Whether a given bill will be proposed and is generally a matter of the legislative priorities of government. Legislation is regarded as one of the three main functions of government, which are often distinguished under the doctrine of the separation of powers.

2.6 Research Gaps

GSCM is increasingly becoming critical for success in manufacturing industries. Yet, like the management of any other input, process and output, SCM requires configuration with business strategy and structure, without which the organization is unlikely to be competitive.

Various other researchers have been done on the this topic including Qinghua et al. (2007) who carried out a study on green supply chain management, pressures, practices and performance within the Chinese automobile industry. They found out that the enterprises have experienced high and increasing regulatory and market pressures and at the same time have strong internal drivers for GSCM practice adoption. Hamner (2012) studied and proposed the involvement of senior leaders can strengthen cooperation with its suppliers and promote the implementation of green supply chain.

Hokey et al. (2011) proposed that reducing the emissions of exhaust and sewage and so on, not only is the premise of ensuring the implementation of green procurement system, but also is the important way to promote the development of green procurement. Zhu et al. (2009) found that external GSCM practice has grown in importance, an argument also supported by Zsidisin and Hendrick (2008) who investigated purchasing managers in Germany, the UK and the USA. This study found out that for effective environmental purchasing there needs to be design specifications for suppliers that include environmental requirements for purchased items, cooperation with suppliers that include environmental objectives, environmental audit for suppliers' internal management and suppliers ISO14001 certification.

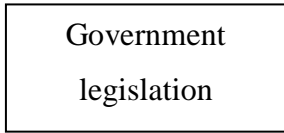
While the above studies have touched on GSCM concept they were carried out in other countries and time has elapsed on their findings. It is also clear that there exists a knowledge gap that the current study would fill. This therefore, set the stage for current study. What then was the effect of GSCM Practices on the performance of manufacturing firms in Nairobi Kenya?

2.7 Conceptual Framework

In this study, the independent variables are green purchasing, green reverse logistics, green marketing and green risk management while the dependent variable is organizational Performance. These variables are related as shown in Figure 2.1.

Independent Variable

Moderating Variable



Dependent Variable

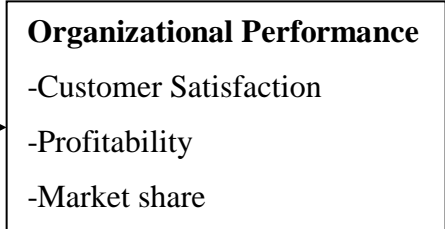


Figure 2.1: Relationship between GSCM Practices Government Legislation and Organizational Performance

The study sought to establish the relationship that exists between the independent variables, moderating and the dependent variable. In the current study the independent variables include green purchasing, reverse logistics, green marketing and green risk management. These variables were considered against Organizational Performance as the dependent variable. On the other hand, the study sought to establish the relationship that exists when a moderating variable of government legislation is added to the relationship. As shown in Figure 2.1 above, there exists a relationship between independent and dependent variables in the study. Application of GSCM practices is expected to have an impact on organizational performance.

Green Purchasing will lead to reduced short procurement distance and inventory costs ultimately leading to timely delivery of materials, products and improved service to customers. Green Purchasing ensures that purchased items possess desirable ecological attributes such as reusability, recyclability and non-toxic materials. Additionally, green purchasing can also address issues of waste reduction, material substitution through proper sourcing of raw materials and waste minimization of hazardous materials. Supplier involvement is crucial to achieving environmental goals.

Green Reverse logistics will reduce space and time; this is expected to have an impact in

reliability and responsiveness. Green Reverse Logistics is the task of recovering discarded products and may also include packaging and shipping materials and backhauling them to a central collection point for either recycling or remanufacturing. Handling the mechanics of reverse logistics require significant attention by logistics professionals. Product recall requires organization to be able to reverse the normal logistics flow from suppliers to customers so that inventory deemed unsuitable can be located by customers and returned to suppliers in a timely and cost effective manner.

Green marketing involves all the activities required to deliver the final product to the consumer. It may involve packaging, transportation, location analysis, and warehousing and inventory management. The firms have to consider a mode of transport with less carbon print, better packaging methods like recyclable containers, well designed warehouses and improved inventory management skills. Green marketing focuses on the green products like hybrid vehicles and the greening of processes like reducing carbon prints. These practices are geared towards reducing the impact of the product to the environment

Green risk management networks have some generic characteristics related to the coordination requirement of two markets, improved risk management, reduced payment of fines, supply uncertainty, returns disposition decisions, postponement and speculation. While the emphasis was initially on technical improvements that can be undertaken to both products and processes with an aim of reducing environmental costs, environmentally proactive organizations adopting green risk management have now recognized that it is critical to develop a healthy working relationship with consumers, suppliers and government authorities in order for design for environment to truly become an integral part of Green Supply Chain initiatives.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter briefly explained the design of the study, target population and sample design, data collection methods, data processing, analysis, interpretation and reporting procedures that were used in the study.

3.2 Research Design

Across sectional survey design was used to study the relationship between Green Supply Chain Management Practices and firm performance at a single point in time. According to Cooper and Schindler (2003), a cross sectional survey is done at only one point in time or over a short period, collecting of data pertaining to the variables in a population or sample is done at a point in time. For this study a cross sectional design was appropriate so as to determine the effect of GSCM practices on the performance of manufacturing firms in Nairobi Kenya. Cross-sectional research design uses different groups of respondents to study a variable at various levels and its effects on another variable that can be divided into various levels as given in factorial design (KIM, 2000). The design has the ability to allow for data collection, analysis and reporting within the prescribed duration for academic purposes. Similar studies have successfully used this design. A common goal of survey research was to collect data representative of a population. The researcher uses information gathered from the survey to generalize findings from a drawn sample back to a population, within the limits of random error.

3.3 Population of the Study

The population of this study constituted all manufacturing firms in Nairobi Kenya. There were 453 manufacturing firms in Nairobi area which the study targeted (Kenya Association of Manufacturers, 2013). The population under study have homogeneous characteristics. Homogeneity has been described as the complete set of individuals, organizations or items with the same common observable characteristics (Mugenda & Mugenda, 2003).

3.4 Sampling Technique and Sample Size

Owing to the fact the number of firms in Nairobi was large and the time and resources available were not sufficient to collect data from all of them a representative sample was therefore needed for this study. A probability sampling technique was employed where a

sample size of 208 firms were selected from each sector. The firms were clustered according to sector and a proportionate stratified random sample of the firms were picked from each cluster according to the sectors or their area of specialization such as those dealing energy, food, beverages and chemical formed same clusters. The respondents were chosen based on proportionate sampling where each cluster or sector is further subdivided into sub population and then using a simple random sampling to get the actual respondents from each sector.

To determine the sample size, the following formula suggested by Kothari (2003) was used.

$$N = \frac{X^2 N p q}{\{d^2(N-1) + X^2 p q\}}$$

Where

n=Desired sample size

N=Target population

P=population proportion

q =1-p

d = corresponding to significance level which was the degree of accuracy reflected by amount of error that was associated with the sample size of the population

X^2 = chi square value for one degree of freedom relative confidence at 95% confidence level $X=1.96$

$$n = \frac{1.96^2 \times 453 \times 0.5 \times 0.5}{\{0.05^2(453-1) + 1.96^2 \times 0.5 \times 0.5\}}$$

$$= 435.0612 / 2.0904$$

n =208 respondents

The manufacturing firms in Nairobi were divided into different sector depending on the product or service they dealt with as shown in Table 3.1.

Table 3.1: Population and Sample by Sector

Sector	Population	Sample
Energy Sector	42	19
Chemical Sector	60	27
Food and Beverage Sector	102	46
Plastic and Rubber	51	24
Building Sector	6	3
Paper Sector	48	22
Textile Sector	39	18
Timber and Wood Products Sector	22	10
Metals and Allied Sector	38	18
Pharmaceutical and Medical Equipment	20	9
Leather Products and Footware	8	4
Motor Vehicle Assembly and Accessories	17	8
Total	453	208

Source: KAM (2013)

3.5 Data Collection

The study used primary data. Primary data consists of original data gathered by the researcher for specific purpose study at hand (Mugenda and Mugenda, 1999). Data was collected by the use of questionnaires administered by the researcher. As the name suggests, questionnaires are a set of questions that have been structured down for the respondent either to be structured or semi-structured, to be used by the interviewer while interviewing the respondent (Mugenda & Mugenda, 1999).

The questionnaires contained both structured and non-structured questions, designed to gather maximum data to achieve each objective of the study. Both quantitative and qualitative data was collected by the use of the mentioned instrument. Section one of the questionnaire capture the general information about the selected manufacturing industries while section two focused on the GSCM practices comprising of green purchasing, green risk management, reverses logistics and green marketing. Subsequent sections focused on performance measures of the firms. One questionnaire was used to collect data from each firm and the respondents was Procurement Officers in Supply Chain Management because they are directly involved in the subject of study.

3.6 Pre-testing of the Data Collection Instruments

Pre-testing is a small-scale trial of a particular research component (Cooper & Schindler, 2003). The researcher subjected the draft questionnaire to a pilot test on ten manufacturing firms in Nairobi that were not part of the selected sample. One questionnaire was administered to each of the organizations in some sectors of the manufacturing industry. The purpose was to test for validity and reliability.

3.6.1 Reliability and Validity

The study used content validity which draws an inference from test scores to a large domain of items similar to those on the test. Content validity was concerned with sample-population representativeness. Robson (2002) stated that the knowledge and skills covered by the test items should be representative to the larger domain of knowledge and skills. Expert opinion was requested to comment on the representativeness and suitability of questions and gave suggestions of corrections to be made to the structure of the research tools. This helped to improve the content validity of the data that was collected. Content validity was obtained by asking for the opinion of the supervisor, lecturers and other professionals on whether the questionnaire was adequate.

Reliability focuses on the degree of consistency in assignment of similar words, phrases or other kinds of data to the same pattern or theme by different researchers (Hussey & Collis, 2009). It also means the degree of consistency that the same researcher assigns similar observations and interpretations at different points in time. The study used the Cronbach's Alpha that is widely used to assess internal consistency reliability and was used for three, four, or five point likert scale items with 0.7 being the cut-off point (Oncu, 1994). The results are as shown in the Table 3.2.

Table 3. 2: Reliability Analysis

Variable	Cronbach's Alpha	Number of Items	Comment
Green purchasing	0.846	5	Reliable
Green reverse logistics	0.785	5	Reliable
Green marketing	0.831	5	Reliable
Green risk management	0.962	5	Reliable

According to Oncu (1994), an Alpha value greater than 0.7 is a desirable threshold for benchmarking the internal consistency of the data collection tool. A Cronbach Alpha was determined for every objective which formed a scale in the research. Table 3.2 shows that green risk management had the highest reliability ($\alpha=0.962$), followed by green purchasing ($\alpha=0.846$), then green marketing ($\alpha=0.831$) and finally reverse logistics ($\alpha=0.785$) evidently, all the four variables were reliable and their reliability values exceeded the prescribed threshold of 0.7.

3.7 Data Analysis and Presentation

Once data had been collected it was recorded, edited and cleaned before analysis for both quantitative and qualitative data using the appropriate tools. On the other hand, the study used descriptive and inferential statistics to analyse the quantitative data. This study utilized the SPSS software to perform correlation and regression analysis on the collected data.

The following multivariate regression analysis model on the effect of green supply chain management on performance of manufacturing firms was adopted and analysed using the SPSS software. The prediction equation was as shown below:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where Y= performance of selected manufacturing firms at time (t).

X_1 = Green purchasing

X_2 =Green Reverse logistics

X_3 = Green marketing

X_4 = Green risk management

β_0 : Y intercept; and reflects the constant of the equation.

$\beta_1 - \beta_4$ = Regression coefficients.

ε = error term.

The analysed data was presented using statistical and graphical techniques. Statistical techniques used involved measures of central tendency including the mean, median and mode. The study also used measures of dispersion such as standard deviation and variance. Graphical techniques involved the diagrammatic representation by use of tables and charts.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This chapter presents data analysis of the findings obtained from the field. It presents the background information of the respondents, findings of the analysis based on the objectives of the study. Descriptive statistics have been used to discuss the findings of the study.

4.1.1 Response Rate

The study targeted a sample size of 208 respondents from which 180 responded which constituted 86.5%. This response rate was satisfactory to make conclusions for the study. The response rate was representative. According to Mugenda and Mugenda (2003), a response rate of 50% is adequate for analysis and reporting; a rate of 60% is good and a response rate of 70% and over is excellent. Based on the assertion, the response rate was considered to excellent.

Table 4.1: Response Rate

Sector	Questionnaires Administered	Questionnaires filled & Returned	Percentage
Energy Sector	19	16	84.2
Chemical Sector	27	23	85.2
Food and Beverage Sector	46	42	91.3
Plastic and Rubber	24	21	87.5
Building Sector	3	2	66.7
Paper Sector	22	19	86.4
Textile Sector	18	17	94.4
Timber and Wood Products Sector	10	9	90.0
Metals and Allied Sector	18	14	77.8
Pharmaceutical and Medical Equipment	9	8	88.9
Leather Products and Footware	4	3	75.0
Motor Vehicle Assembly and Accessories	8	6	75.0
Total	208	180	86.5

As illustrated in the Table 4.1 majority of the respondents were from the food and beverage sector in line with the number of respondents targeted.

4.2 Demographic Information

This section investigated the respondent's demographic data. Specifically, the areas researched on include gender distribution highest level of education attained and period of service in the enterprise.

4.2.1 Distribution of Respondents by Age

Respondents of different age set are perceived to hold dissimilar opinion of various issues. To ensure that opinions from all age groups were encapsulated in this study, respondents were requested to specify their age group. Results are analysed in figure 4.1.

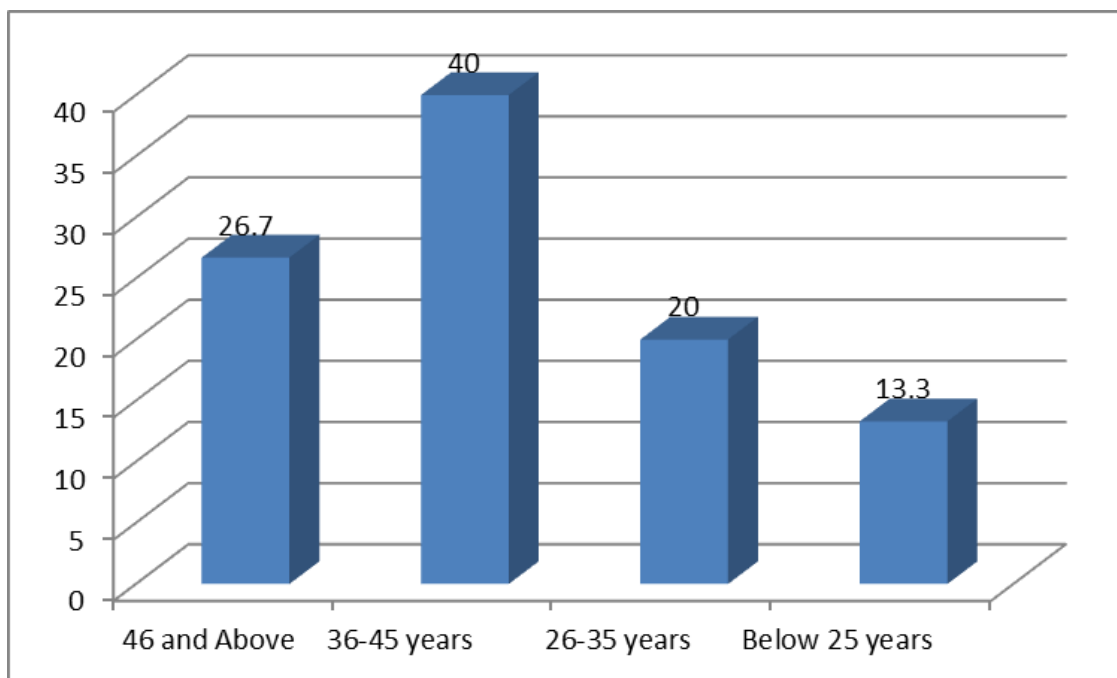


Figure 4. 1: Distribution of Respondents by Age

The results in figure 4.1 show that most of the respondents as shown by 40.0% were aged between 36-45 years, 26.7% of the respondents were aged 46 and above, 20.0% of the respondents were aged between 26-35 years while 13.3% the respondents were aged Below 25 year this shows that respondents were fairly distributed in terms of their gender thus the findings of this study did not suffer from gender biasness.

4.2.2 Level of Education

Personal level of education is associated with individual ability to respond to various issues or challenges and redress of the same. In view of ascertaining respondents' ability to respond

to research questions and responders were requested to indicate their highest level of education achieved. Results are analysed in figure 4.2.

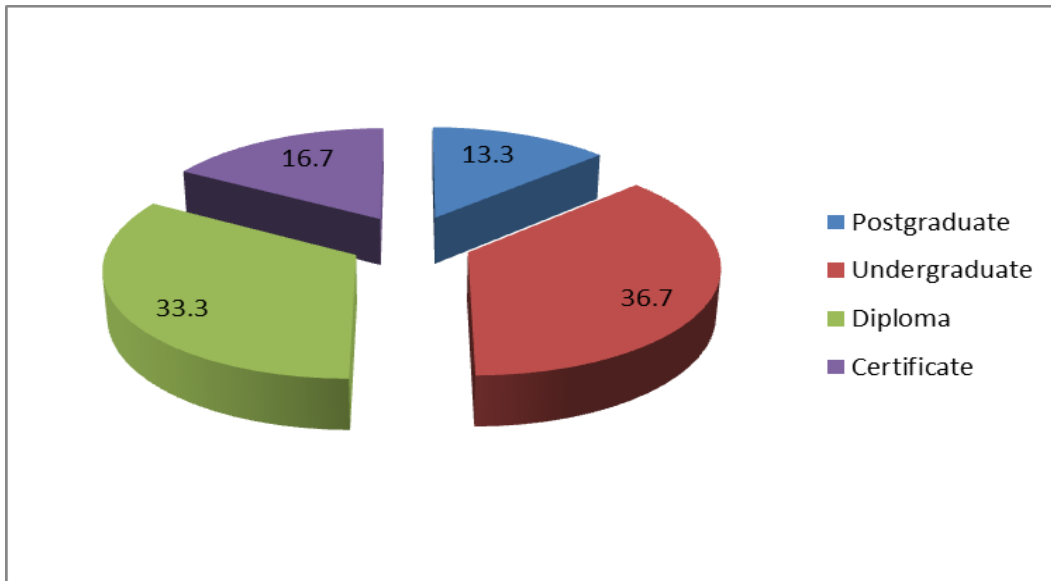


Figure 4. 2: Level of education

Figure 4.2 shows that most of the respondents as shown by 36.7 % held undergraduate level 33.3% of the respondents indicated diploma, 16.7 % of the respondents indicated certificate while 13.3% of the respondents indicated certificate. This implies that respondents were well educated which means that they were in a position to respond to research questions with ease.

4.2.3 Number of Years in Service

Employee period of service is highly associated with employee knowledge on organisational internal operations. Therefore, to gauge the quality of information that respondents were likely to offer, respondents were requested to specify the Number of years they had served for in manufacturing industry. Results are analysed in Figure 4.3.

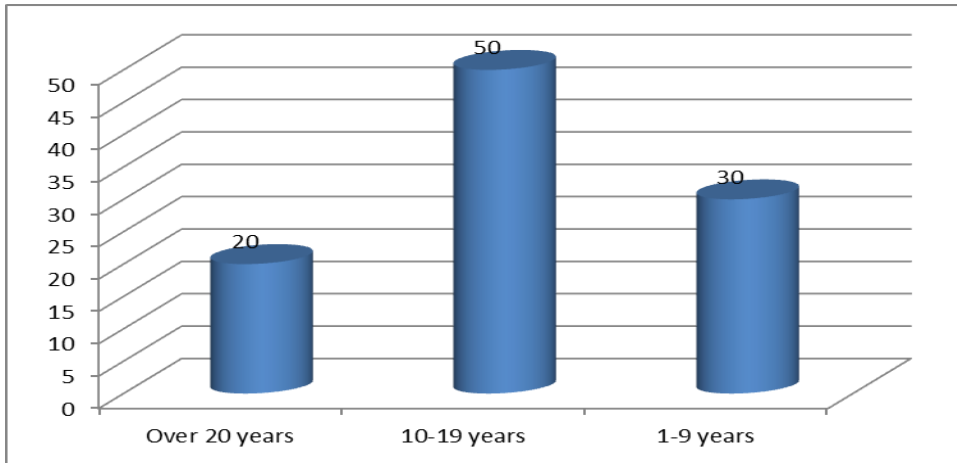


Figure 4. 3: Number of Years in Service

The results in figure 4.3 show that majority of the respondents as shown by 50.0% have worked with manufacturing firms for a period of 10 to 19 years 30.0% have worked with manufacturing firms for a period of 1 to 9 years while 20.0% have worked with manufacturing firms for a period of over 20 years. This implies that majority of the respondents had worked with manufacturing firms for a considerable period of time which mean that they were in a position to give credible information relating to this study.

4.2.4 Gender Distribution

Respondents were requested to indicate their gender category. This was sought in view of ensuring gender involvement in this study. Results are analysed in figure 4.4.

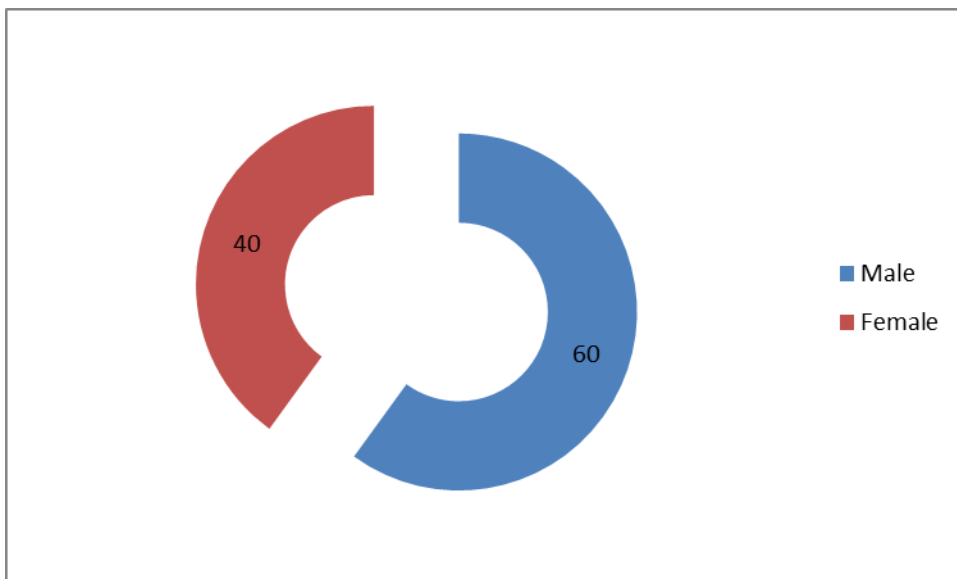


Figure 4. 4: Gender Distribution

As shown in Figure 4.4, majority of the respondents as shown by 60.0% were males whereas 40.0% were females. This implies that both male and female respondents were well evolved in this study. And thus, the findings of this study did not suffer from gender biasness.

4.3 Green Purchasing

This section investigates the effect of green purchasing on performance of manufacturing firms in Nairobi Kenya. The study sought to determine the extent to which respondents agreed with the following statements investigating the effect of green purchasing adoption on performance of manufacturing firms. The analysis was done using percentages, means and standard deviations. Results are analysed in Table 4.2.

Table 4.2: Distribution of Green Purchasing

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std Deviation
There is a reduction in the waste of resources	3.3%	6.7%	6.7%	50%	33.3%	4.03	0.99
The firm is able to minimize cost	6.1%	0%	0%	65.6%	28.3%	4.10	0.91
There is increased percentage of environmental innovations	10.0%	3.3	0%	50.0%	36.7	4.00	1.19
This practice promotes recycling and reclamation of purchased materials	9.4%	6.7%	0%	51.1%	32.8%	3.91	1.20
The practice integrates suppliers in a participative decision-making process	3.9%	0%	0%	63.9%	32.2%	4.21	0.80
The practice integrates suppliers in a participative decision-making process	3.9%	3.9%	0%	58.3%	33.9%	4.14	0.91
Promotion of environmental innovation is achieved	6.7%	0%	0%	59.4%	33.9%	4.14	0.96
This is an important way to promote the development of green procurement	0%	2.2%	13.9%	50.0%	33.9%	3.88	1.29
Green purchasing can improve a firm's economic position	2.8%	3.9%	0%	62.2%	31.1%	4.14	0.87
There is improved organization's public image	0%	0%	0%	66.7%	33.3%	4.33	0.47

As shown in Table 4.2, majority of the respondents agreed that green purchasing practice integrates suppliers in a participative decision-making process (Mean = 4.21 std deviation = 0.80) green purchasing has resulted to improved organization's public image (Mean = 4.33, std deviation = 0.47), green purchasing integrates suppliers in a participative decision-making process, Promotion of environmental innovation is achieved through green purchasing, Green purchasing improves a firm's economic position (Mean = 4.14 std deviation = 0.91), through green purchasing, the firm is able to minimize operational cost (Mean = 4.10 std deviation = 0.91) and that There is a reduction in the waste of resources (Mean = 4.03 std deviation = 0.99). The finding is in line with the research by Pun, (2006). These findings concur with that of Jumadi and Zailani (2010) who depicts that a reduction in the product environmental impact may be achieved not only through an appropriate product design, but also a proper use by consumers.

The study also revealed that green purchasing has resulted to increased environmental innovations (mean = 4.00 std deviation = 1.19) green purchasing promotes recycling and reclamation of purchased materials (mean = 3.91, std deviation = 1.20), this is an important way to promote the development of green procurement (mean = 3.88, std deviation = 1.29). These findings correspond with those of Colicchia *et al*, (2011) who states that initiatives to minimize environmental impact in inbound supply chain, according to the "green procurement" approach include eco-labeled product purchase, adoption of environmental criteria into the supplier assessment system environmental and collaboration with suppliers.

4.4 Green Reverse Logistics

This section investigates the effect of reverse logistics on performance of manufacturing firms in Nairobi Kenya. The study sought to determine the extent to which respondents agreed with the following statements investigating the effect of reverse logistic adoption on performance of manufacturing firms. Results are presented in Table 4.3.

Table 4.3: Distribution of Reverse Logistics

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std Deviation
There is improved overall quality	0%	0%	3.3%	63.3%	33.3%	4.30	0.53
The organization has management of reverse flow	0%	0%	56.7%	56.7%	43.3%	4.43	0.50
Product lifecycle offers a valuable source of insight about the changing needs	0%	6.7%	0%	60.0%	33.3%	4.27	0.58
There are more powerful customers	0%	0%	10%	60.0%	20%	4.40	0.49
There is increased multichannel retailers	0%	0%	3.3%	53.3%	43.3%	4.40	0.56
The reverse logistics channels used seem to have received minimal attention	3.3%	3.3%	0%	56.7%	36.7	4.27	0.68
Efficiency, accuracy and timeliness in reverse supply chains activities are a priority	0%	0%	0%	66.7%	33.3%	4.33	0.47
There is more strategic focus on reverse logistics	0.1%	3.3%	3.3%	63.3%	30%	4.20	0.66
Sorting and Recycling are an important mechanism	0%	3.3%	6.7%	50.0%	40.0%	4.27	0.73
Ccollection schemes should be classified according to materials	3.3%	3.3%	0%	60.0	33.3	4.23	0.67

As shown in Table 4.3, majority of the respondents agreed that reverse logistic adoption resulted to better organisation management of reverse flow (mean = 4.43 std deviation =0.50), escalation of more powerful customers, there is increased multichannel retailers (mean = 4.40 std deviation = 0.56), reverse logistic adoption has promoted efficiency, accuracy and timeliness in reverse supply chains activities are a priority(mean = 4.33 std deviation = 0.47), and that reverse logistic adoption resulted to improved overall quality in supply operations (mean = 4.30 std deviation =0.53). the study also revealed that reverse logistics allows a manufacturing to receive products back from the consumer or send unsold merchandise back to the manufacturer to be taken apart, sorted, reassembled or recycled; minimising overall costs for an organisation. These findings are in line with the research by

Lembke (2012) that reverse logistics can be valuable in increasing product lifecycles, supply chain complexity, maintainable practices and consumer preferences; which have to be improved on to maintain productivity and growth.

The study also revealed that product lifecycle offers a valuable source of insight about the changing needs, the reverse logistics channels used seem to have received minimal attention, sorting and recycling are an important mechanism (mean = 4.27 std deviation = 0.73), collection schemes should be classified according to materials (mean = 4.23 std deviation = 0.67), there is more strategic focus on reverse logistics (mean = 4.20 std deviation = 0.66). The finding is in line with the research by Helms, (2012) reverse logistic gains include; increasing speed of production, reducing costs (transportation, administrative, and aftermarket maintenance, repair and replacement), retaining customers by improving service goals and meeting sustainability goals. Reverse logistics can include gaining feedback to make improvements and to improve the understanding of real reasons for product returns. More value can be extracted from used/returned goods instead of wasting manpower, time and costs of raw materials involved in the original supply chain and that improved customer satisfaction and loyalty by paying more attention to faulty goods, and repairs of merchandise.

4.5 Green Marketing

This section investigates the effect of green marketing on performance of manufacturing firms in Nairobi Kenya. The study sought to determine the extent to which respondents agreed with the following statements investigating the effect of green marketing adoption on performance of manufacturing firms. The results are Presented in Table 4.4.

Table 4.4: Distribution of Green Marketing

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std Deviation
The organization has a social responsibility	0%	6.7%	0%	56.7%	36.7%	4.23	0.76
The firm is able to meet customer expectations	6.7%	20.0%	8.9%	34.4%	30.0%	3.61	1.28
The practice provides more information externally	0%	0%	0%	66.7%	33.3%	4.33	0.47
The practice builds new relations across the supply chain	3.3%	8.3%	8.9%	44.4%	35.0	3.99	1.04
The firm is able to survive in the green competitive world	3.9%	15.0%	2.8%	49.4%	28.9%	3.84	1.12
Green marketing supports green manufacturing since it is customer/demand focused	1.7%	10.6%	0%	43.3%	44.4%	4.18	0.99
Firms are able to develop their own positive efforts to be more socially responsible	3.3%	20%	5%	38.3%	3.3%	3.78	1.20
The firm is able to meet customer expectations for more environmentally conscious products	1.7%	13.9%	3.3%	47.8	33.3%	3.97	1.04
This practice has led to new relations across the supply chain	1.7%	7.2%	5.6%	58.9%	26.7%	4.02	0.87
Government should take necessary steps and encourage the manufacture of green products.	1.7%	11.1%	3.3%	65%	18.9%	3.88	0.90

As shown in Table 4.4, majority of the respondents agreed that green marketing provides more information externally (mean = 4.33 std deviation = 0.47), the organization has a social responsibility (mean = 4.23 std deviation = 0.76), green marketing supports green manufacturing since it is customer or demand focused (mean = 4.18 std deviation = 0.99), green marketing has led to new relations across the supply chain (mean =4.02, std deviation =0.87), green marketing practice builds new relations across the supply chain (mean = 3.99, std deviation =1.04). The findings are in line with the research by Iles (2006), that green marketing can help companies reduce operating and production costs, specifically by lowering energy usage.

The study also revealed that through green marketing manufacturing firms have developed new relations across the supply chain (mean = 3.99, std deviation =1.04) manufacturing firms are able to meet customer expectations for more environmentally conscious products (mean =

3.97 std deviation = 1.04) governments should take necessary steps and encourage the manufacture of green products. (Mean = 3.88 std deviation =0.90) through green marketing manufacturing firms are able to survive in the green competitive world (mean = 3.84 std deviation = 1.12) manufacturing firms have developed their own positive efforts to be more socially responsible (mean = 3.78 std deviation = 1.20) and that manufacturing firms are able to meet customer expectations (mean = 3.61 std deviation =1.28). The findings concur with the research by Fox (2007) that environmentally sensitive companies are more attractive to potential employees who seek to become part of a positive corporate culture.

4.6 Green Risk Management

This section investigates the effect of green risk management on performance of manufacturing firms in Nairobi. The study sought to determine the extent to which respondents agreed with statements investigating the effect of green risk management adoption on performance of manufacturing firms. Results are analysed in Table 4.5.

Table 4.5: Distribution of Green Risk Management

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std Deviation
The firm is able to survive in the green competitive world	7.8%	7.8%	10.6%	36.7%	37.2%	3.88	1.22
Environmental issues are becoming an intrinsic part of supply chain risk management	2.2%	0%	8.3%	60.6%	28.9%	4.14	0.75
Organizations are integrating their supply chains risk management department to reduce operating costs	7.8%	10.0%	5.0%	36.7%	40.6%	3.92	1.25
Organizations are integrating their supply chains risk management department to improve their customer service.	2.2%	5%	8.9%	51.1%	32.8%	4.07	0.90
The primary driving force to green risk management is an urge to meeting regulations	5.6%	6.1%	2.8%	45.6%	40%	4.08	1.08
The effectiveness of green purchasing depends on whether the firm has centralized or decentralized decision-making.	7.8%	2.8%	0.6%	43.3%	45.6%	4.16	1.12

The results in Table 4.5 show that, majority of the respondents agreed that effectiveness of green purchasing depends on whether the manufacturing firm has centralized or decentralized decision-making, (mean = 4.16 std deviation = 1.12), environmental issues are becoming an intrinsic part of supply chain risk management (mean =4.14 std deviation =0.75), the primary driving force to green risk management is an urge to meeting regulations (mean = 4.08 std deviation = 1.08). The finding is in line with the research by Min and Galle (2007) that green risk management provides framework for identifying, evaluating and mitigating the challenges arising at the intersection of risk and sustainability.

The study also revealed that organizations are integrating their supply chains risk management department to improve their customer service, (mean = 4.07 std deviation =0.90) organizations are integrating their supply chains risk management department to reduce operating costs (mean = 3.92 std deviation =1.25), the firm is able to survive in the green competitive world (mean = 3.88 std deviation =1.22). The findings concur with the research by Hock and Erasmus (2000) that green building green risk management in supply chain design and operations directly mitigate risks and provide significant protection against exposure for enterprises of all types

4.7 Performance of Manufacturing Firms

The study sought to establish the firm’s performance in the following aspects of performance. Results are analysed in Table 4.6.

Table 4.6: Distribution of Organizational Performance

Statement	Highly Decreased	Decreased	Not changed	Increased	Very much increased	Mean	Std Deviation
Customer satisfaction	0%	3.3%	6.7%	46.7%	43.3%	4.30	0.74
Profitability	0%	0%	3.3%	50.0%	46.7%	4.43	0.56
Market share	0%	0%	3.3%	60.0%	36.7%	4.33	0.54
Sales volume	3.3%	20%	5%	38.3%	3.3%	3.78	0.42

As shown in table 4.6, majority of the respondents agreed that most of the manufacturing the firm’s performance had realised great improvement on profitability (mean =4.43 std deviation =0.56), customer satisfaction (mean = 4.30 std deviation =0.74), market share (Mean = 4.33

std deviation = 0.54) and sales volume (Mean = 3.78, std deviation = 0.42). The study also found that inventory control and Security of stocks in most of the manufacturing companies was up to standard. Companies ensure quality products are produced and distributed to the customers there is flexibility in the ordering process supply chain decisions in the company are always made in time, in case of a complaint from the customer, the appropriate actions are taken in time, deliveries to customers are always made in time, accuracy of orders delivered is highly maintained and that there is accurate and timely information dissemination within the company and the customers. The findings concur with the research findings by Ayodele (2011) that adoptions of GSCM practices are key to achieving positive performance in profitability.

4.8 Test of Hypotheses

This section presents analysis and results of the tests of hypotheses using inferential statistics. The section presents the results of statistical analyses and interpretations of the results in relation to the research hypotheses.

4.8.1 Green Purchasing and Performance of Manufacturing Firms

The focus of hypothesis one was to determine the relationship between green purchasing and performance of manufacturing firms in Nairobi. It was hypothesised that green purchasing has a positive effect on the performance of manufacturing firms in Nairobi Kenya. This hypothesis was tested using Pearson’s Moment Correlation. To test the first hypothesis, the index of performance of manufacturing firms in Nairobi as index of dependent variable was correlated upon green purchasing as a composite of independent variable. The results were shown in Table 4.7.

Table 4.7: Effect of green purchasing on Performance of manufacturing firms in Nairobi

Variable		Performance of manufacturing firms	Green purchasing
Performance of manufacturing firms	Pearson Correlation	1	.598
	Sig. (1-tailed)		.046
	N	180	180
Green purchasing	Pearson Correlation	.598	1
	Sig. (1-tailed)	.046	
	N	180	180

Table 4.7 displays the results of correlation test analysis between the dependent variable (performance of manufacturing firms in Nairobi) and the independent variable (green purchasing). The study found a strong correlation coefficient between performance of manufacturing firms in Nairobi and green purchasing as shown by correlation factor of 0.598. This strong relationship was found to be statistically significant as the significant value was 0.046 which is less than 0.05 thus the null hypothesis one, which stated that there is no relationship between green purchasing and performance of manufacturing firms in Nairobi, is not accepted. The implication is that there exists a significant positive relationship between green purchasing and performance of manufacturing firms in Nairobi. This reveals that any positive change in green purchasing would enhance performance of manufacturing firms in Nairobi. This corresponds with Colicchia *et al*, (2011) who indicated that initiatives to minimize environmental impact in inbound supply chain, according to the “green procurement” approach include eco-labeled product purchase, adoption of environmental criteria into the supplier assessment system environmental and collaboration with suppliers.

4.8.2 Green Reverse Logistics and Performance of Manufacturing Firms

The aim of hypothesis two was to establish the relationship between green reverse logistics and performance of manufacturing firms in Nairobi. To test the second hypothesis, the index of Performance of manufacturing firms in Nairobi as index of dependent variable was correlated upon green reverse logistics a composite of independent variable using Pearson’s Moment Correlation. The results were shown in Table 4.8.

Table 4.8: Effect of Green reverse logistics on Performance of manufacturing firms

Variable		Performance of manufacturing firms	Green reverse logistics
Performance of manufacturing firms	Pearson Correlation	1	.843
	Sig. (2-tailed)		.016
	N	180	180
Green reverse logistics	Pearson Correlation	.843	1
	Sig. (2-tailed)	.016	

Table 4.8 displays the results of correlation test analysis between the dependent variable (performance of manufacturing firms in Nairobi) and the independent variable (green reverse logistics). The study found a strong positive correlation coefficient between Performance of

manufacturing firms in Nairobi and green reverse logistics as shown by correlation factor of 0.843. The P- value was 0.016 which is less than 0.05 and therefore the null hypothesis two which stated that there is no relationship between green reverse logistics and performance of manufacturing firms in Nairobi, is not accepted. The implication is that there exists a significant positive relationship between green reverse logistics and performance of manufacturing firms in Nairobi. This reveals that any positive change in green reverse logistics practices would enhance performance of manufacturing firms in Nairobi. The findings are in line with the research by Lembke (2012) that reverse logistics can be valuable in increasing product lifecycles, supply chain complexity, maintainable practices and consumer preferences; which have to be improved on to maintain productivity and growth.

4.8.3 Green Marketing and Performance of Manufacturing Firms

The main objective of hypothesis three was to establish the relationship between green marketing and performance of manufacturing firms in Nairobi. To test the third hypothesis Karl Pearson’s Moment Correlation was used with performance of manufacturing firms in Nairobi being the dependent variable while green marketing was the independent variable. The findings are displayed in Table 4.9.

Table 4.9: Relationship between green marketing and performance of manufacturing firms

Variable		Performance of manufacturing firms	Green marketing
Performance of manufacturing firms	Pearson Correlation	1	.802
	Sig. (1-tailed)		.001
	N	180	180
Green marketing	Pearson Correlation	.802	1
	Sig. (1-tailed)	.001	
	N	180	180

The results in Table 4.9 shows a positive correlation coefficient between Performance of manufacturing firms in Nairobi and green marketing as shown by correlation factor of 0.802. This relationship was found to be statistically significant as the probability value was 0.001 which is less than 0.05, thus we reject the null hypothesis three which stated that there is no relationship between top green marketing and performance of manufacturing firms in Nairobi. This implies that any positive change in green marketing practice would enhance

performance of manufacturing firms in Nairobi. The findings further concur with Iles (2006) who indicated that green marketing can help companies reduce operating and production costs, specifically by lowering energy usage. In addition, Fox (2007) observed that environmentally sensitive companies are more attractive to potential employees who seek to become part of a positive corporate culture.

4.8.4 Green Risk Management and Performance of Manufacturing Firms

The fourth objective sought to find out the effect of green risk management on performance of manufacturing firms in Nairobi. It was then hypothesized that green risk management had a positive significant effect on performance of manufacturing firms in Nairobi. The hypothesis was tested using Pearson’s moment correlation. This test was used to establish whether there was a positive relationship between the independent variable (green risk management) and the dependent variable (performance of manufacturing firms in Nairobi). The results are shown in Table 4.10.

Table 4.10: Relationship between Green risk management and performance of manufacturing firms in Nairobi

Variable		Performance of manufacturing firms	green risk management
Performance of manufacturing firms	Pearson Correlation	1	.722
	Sig. (2-tailed)		.008
	N	180	180
Green risk management	Pearson Correlation	.722	1
	Sig. (2-tailed)	.008	
	N	180	180

Table 4.10 shows that there was a positive correlation (0.722) between green risk management and performance of manufacturing firms in Nairobi. The p-value was 0.008 and thus, less than the alpha level of 0.05 hence establishing a positive significant relationship between these variables. This implies that green risk management had a positive significant effect on performance of manufacturing firms in Nairobi. Therefore, based on these findings, the null hypothesis that there is no relationship between green risk management and performance of the firm is therefore rejected. This depicts that any positive change in green risk management practices would enhance performance of manufacturing firms in Nairobi. The findings are consistent with Min and Galle (2007) findings that green risk management

provides framework for identifying, evaluating and mitigating the challenges arising at the intersection of risk and sustainability. The findings also concur with the research by Hock and Erasmus (2000) that green building green risk management in supply chain design and operations directly mitigate risks and provide significant protection against exposure for enterprises of all types.

4.9 GSCM Practices and Performance of Manufacturing Firms

In this study, a multiple regression analysis was conducted to test the influence among predictor variables. The research used statistical package for social sciences (SPSS V 22.0) to code, enter and compute the measurements of the multiple regressions. The model summary is presented in the Table 4.11.

Table 4.11: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.818 ^a	.669	.652	.37290

The study used coefficient of determination to evaluate the model fit. The adjusted R², also called the coefficient of multiple determinations, is the percent of the variance in the dependent explained uniquely or jointly by the independent variables. The model had an average adjusted coefficient of determination (R²) of 0.652 and which implied that 65.2% of the variations on performance of manufacturing firms in Nairobi are explained by the independent variables under study (green purchasing, reverse logistics, green marketing and green risk management).

The study further tested the significance of the model by use of ANOVA technique. The findings are tabulated in Table 4.12.

Table 4.12: ANOVA Results

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	8.552	4	2.138	5.717	.000 ^b
1	Residual	65.45	175	0.374		
	Total	74.002	179			

From the ANOVA statics, the regression model was found to be valid (F = 5.717, P < 0.05). This implies that the variables green purchasing, reverse logistics, green marketing and green risk management are good predictors of performance of manufacturing firms in Nairobi.

In addition, the study used the coefficient table to determine the study model. The findings are presented in the Table 4.13.

Table 4.13: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	0.176	0.067		2.627	.0121
Green purchasing	0.571	0.166	0.532	3.442	.0013
1 Green reverse logistics	0.817	0.238	0.767	3.431	.0014
Green marketing	0.782	0.301	0.694	2.590	.0132
Green risk management	0.674	0.202	0.613	3.337	.0018

As per the SPSS generated output as presented in table above, the equation becomes:

$$Y = 0.176 + 0.571X_1 + 0.817X_2 + 0.782X_3 + 0.674X_4$$

From the regression model obtained above, a unit change in green purchasing holding the other factors constant would positively change performance of manufacturing firms in Nairobi by a factor of 0.571; a unit change in reverse logistics while holding the other factors constant would positively change performance of manufacturing firms in Nairobi by a factor of 0.817, a unit change in green marketing while holding the other factors constant would positively change performance of manufacturing firms in Nairobi by a factor of 0.782 while a unit change in green risk management while holding the other factors constant would positively change performance of manufacturing firms in Nairobi by a factor of 0.674.

The findings above conform to findings by March (2011), that green purchasing strategies are directly related to performance of organisations. The findings also concur with the research by Hock and Erasmus (2000) that green building green risk management in supply chain design and operations directly mitigate risks and provide significant protection against exposure for enterprises of all types. The findings concur with Franks and Curswoth (2003) who found out that green risk management is positive relationship with performance of organisations. The findings further agree with Ayodele (2011) that reverse logistics was key to achieving positive performance in profitability.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presented the discussion of key data findings, conclusion drawn from the findings highlighted and recommendation made there-to, the conclusions and recommendations drawn were focused on addressing the objectives of the study. Finally, the chapter discusses implications of the study to the management theory and directions for further studies.

5.2 Summary of the Findings

In line with the first objective the study investigated the relationship between green purchasing and performance of manufacturing firms in Nairobi Kenya. Prediction results obtained from the regression showed that a unit change in green purchasing holding the other factors constant would positively change performance of manufacturing firms in Nairobi. The study also noted that green purchasing practice integrates suppliers in a participative decision-making process green purchasing has resulted to improved organization's public image green purchasing integrates suppliers in a participative decision-making process, Promotion of environmental innovation is achieved through green purchasing, Green purchasing improves a firm's economic position through green purchasing, the firm is able to minimize operational cost and that There is a reduction in the waste of resources The finding is in line with the research by Pun (2006). These findings concur with that of Jumadi and Zailani (2010) who depicts that a reduction in the product environmental impact may be achieved not only through an appropriate product design, but also a proper use by consumers

The study also revealed that green purchasing has resulted to increased environmental innovations green purchasing promotes recycling and reclamation of purchased materials this is an important way to promote the development of green procurement. These findings correspond with those of Colicchia *et al.* (2011) who states that initiatives to minimize environmental impact in inbound supply chain, according to the "green procurement" approach include eco-labeled product purchase, adoption of environmental criteria into the supplier assessment system environmental and collaboration with suppliers. The findings further concur with the study findings by Bowen *et al.* (2011) who argued that Green Supply Chain Management practices attempts to improve the environmental performance of purchased inputs, or of the suppliers who provide them.

The second objective of the study was to determine the effect of Green reverse logistics adoption on performance of manufacturing firms. Results obtained show that a unit change in green reverse logistics while holding the other factors constant would positively change performance of manufacturing firms in Nairobi , further the study revealed that that reverse logistic adoption resulted to better organisation management of reverse flow, escalation of more powerful customers, there is increased multichannel retailers, reverse logistic adoption has promoted efficiency, accuracy and timeliness in reverse supply chains activities are a priority, and that green reverse logistic adoption resulted to improved overall quality in supply operations. The study also revealed that green reverse logistics allows a manufacturing to receive products back from the consumer or send unsold merchandise back to the manufacturer to be taken apart, sorted, reassembled or recycled; minimising overall costs for an organisation. The findings are in line with the research by Lembke (2012) that reverse logistics can be valuable in increasing product lifecycles, supply chain complexity, maintainable practices and consumer preferences; which have to be improved on to maintain productivity and growth.

The study also revealed that product lifecycle offers a valuable source of insight about the changing needs, the reverse logistics channels used seem to have received minimal attention, sorting and recycling are an important mechanism collection schemes should be classified according to materials, there is more strategic focus on reverse logistics. The finding is in line with the research by Helms (2012) reverse logistic Gains include; increasing speed of production, reducing costs (transportation, administrative, and aftermarket maintenance, repair and replacement), retaining customers by improving service goals and meeting sustainability goals. Reverse logistics can include gaining feedback to make improvements and to improve the understanding of real reasons for product returns. More value can be extracted from used/returned goods instead of wasting manpower, time and costs of raw materials involved in the original supply chain and that improved customer satisfaction and loyalty by paying more attention to faulty goods, and repairs of merchandise.

The third objectives were to determine the effect of green marketing on performance of manufacturing firms and the results show that unit change in green marketing while holding the other factors constant would positively change performance of manufacturing firms in Nairobi. Green marketing provides more information, the organization has a social responsibility, green marketing supports green manufacturing since it is customer or demand

focused, green marketing has led to new relations across the supply chain, green marketing practice builds new relations across the supply chain. The findings are in line with the research by Iles (2006), that green marketing can help companies reduce operating and production costs, specifically by lowering energy usage.

The study also revealed that through green marketing manufacturing firms have developed new relations across the supply chain, manufacturing firms are able to meet customer expectations for more environmentally conscious products, governments should take necessary steps and encourage the manufacture of green products, through green marketing manufacturing firms are able to survive in the green competitive world, manufacturing firms have developed their own positive efforts to be more socially responsible, and that manufacturing firms are able to meet customer expectations, The findings concurs with the research by Fox (2007) that Environmentally sensitive companies are more attractive to potential employees who seek to become part of a positive corporate culture.

The fourth objective of the study was to determine the effect of Green risk management on performance of manufacturing firms. The regression results revealed a unit change in green risk management while holding the other factors constant would positively change performance of manufacturing firms in Nairobi. Further the study noted that effectiveness of green purchasing depends on whether the manufacturing firm has centralized or decentralized decision-making, environmental issues are becoming an intrinsic part of supply chain risk management, the primary driving force to green risk management is an urge to meeting regulations. The finding is in line with the research by Min and Galle (2007) that green risk management provides framework for identifying, evaluating and mitigating the challenges arising at the intersection of risk and sustainability.

The study also revealed that organizations are integrating their supply chains risk management department to improve their customer service, organizations are integrating their supply chains risk management department to reduce operating costs, the firm is able to survive in the green competitive world. The findings concurs with the research by Hock and Erasmus (2000) that green building green risk management in supply chain design and operations directly mitigate risks and provide significant protection against exposure for enterprises of all types

The fifth objective of the study was to determine the combined effect of green purchasing, green reverse logistics, green marketing, and green risk management on the performance of manufacturing firms in Nairobi. The regression analysis established that the combination of the objectives had a positive effect on the performance of manufacturing firms. Most of the manufacturing the firm's performance had realised great improvement on profitability, customer satisfaction, market share and sales volume. Companies ensure quality products are produced and distributed to the customers there is flexibility in the ordering process supply chain decisions in the company are always made in time, in case of a complaint from the customer, the appropriate actions are taken in time, deliveries to customers are always made in time, accuracy of orders delivered is highly maintained and that there is accurate and timely information dissemination within the company and the customers.

5.3 Conclusions

The study concludes that green procurement affects supply chain performance to a great extent. Green procurement affects the supply chain performance by ensuring production with low environmental impacts, products which are using environmental friendly processes, environmental collaboration with the suppliers, eco-labelled products and adoption of environmental criteria into the supplier assessment systems.

The study also concludes that implementation of green reverse logistics promoted the performance of manufacturing firms in Nairobi Kenya. Among the benefits realised include reduced administrative, transportation and aftermarket support costs, increased velocity, increased service market share, higher achievement of sustainability goals, greater customer service, higher retention levels and recovery of capital investments in assets.

The study further concludes that green marketing supports performance of manufacturing firms since it is customer or demand focused as opposed to product oriented manufacturing strategy. Through green marketing initiatives firms are able to develop their own positive efforts to be more socially responsible and to meet customer expectations for more environmentally conscious products. Without green marketing initiatives, manufacturers of products that have negative impact on the health of the consumers.

The study concludes that the green risk management practice enables firms to build new relations across the supply chain and that the primary driving force to green risk management is an urge to meeting regulations and that green risk management provides framework for

identifying, evaluating and mitigating the challenges arising at the intersection of risk and sustainability.

5.4 Recommendations of the Study

This study was based on the determination the effect of green purchasing, green reverse logistics, green marketing and green risk management. The findings of this study which were conducted in manufacturing firms in Nairobi County have implications for strategic management theory and management policy and practice as explained below.

5.4.1 Recommendations for Policy and Practice

It is recommended that continuous studies on the GSCM practices on the performance of manufacturing firms should be carried out. This is necessitated by today's business environment that requires organizations to meet the requirements of various standards which provide quality environmental observance systems that are of real benefit to them to help manage their business effectively and put in place best practice methodology. Knowledge on this topic is important in that in today's volatile environment, with the rate of change accelerating, organizations that successfully implement such practices save more money and are poised to gain an advantage over their competitors through continuous research.

Managers must embrace GSCM practices because they are designed to help organizations analyze and improve each element in their operations, from the selection of suppliers through to sales and distribution. The standard will also come in handy in that it helps organizations to improve customer satisfaction levels, internal efficiency and employee involvement.

In the light of this research it is recommended that manufacturing firms need to strive to implement GSCM practices so as to improve on their performance. Reducing the emissions of exhaust and sewage and so on, not only is the premise of ensuring the implementation of green procurement system, but also is the important way to promote the development of green procurement. With this in place organizations can competitively participate in the market place.

Manufacturing firm leaders need embrace GSCM practices fully because for effective environmental purchasing there needs to be design specifications for suppliers that include environmental requirements for purchased items, cooperation with suppliers that include

environmental objectives, environmental audit for suppliers' internal management and suppliers ISO:14001 certification.

The government needs to ensure that there is continuing coordination between the different administrative levels to implement the green supply chain, in order to achieving the highest level of quality in this area, trying to find the friendliest for environmental raw materials which its used in the manufacturing industry. It should also ensure that there is continues safety environmental design and packaging, create an annual training plan according to the workers training needs related to the green supply chain, increased the budget allocated for scientific research in the field of green supply chain, and finally activated the governmental rules and regulations to be more careful about the safety of the environment.

5.4.2 Recommendations for Further Studies

The study sought to establish the effect of GSCM practices on the performance of manufacturing firms in Nairobi Kenya. A study should be conducted on the challenges in using green supply chain management practices at manufacturing firms. Further studies should be conducted on the effect of green supply chain management practices on performance of manufacturing companies in other counties to allow for generalization of results. Another study should be conducted on effect of green supply chain management practices in the service sector such as in banks and insurance companies for comparison purposes.

REFERENCES

- Amemba, C. S. (2013). Green Supply Chain Best Practices in Hospitality Industry in Kenya. *Global Journal of Commerce and Management Perspective*, 2(3),7-18.
- Andebe, E. O. (2013). *Green supply chain management practices of the textile industry in Kenya*. Unpublished MBA project, University of Nairobi.
- Arrow, K. J. (1962). The Economic Implications of Learning by Doing. *Review of Economic Studies*, 29(6), 155-73.
- Bowen, F. E., Cousins, P. D., Lamming, R. C & Faruk, A. C. (2001). The role of supply management capabilities in green supply, *Production and Operations Management*, 10, 2, 174-189.
- Burgess, K., Singh, J. & Koroglu, R., (2006). Supply chain management: a structured literature review and implications for future research. *International Journal of Operations & Production Management*, 26(7),703-729.
- Burt, D. N., Dobler, D. W. & Starling, S. L. (2003). *World Class Supply Management: The Key to Supply Chain Management*, 7th Edition, McGraw-Hill Irwin, New York.
- Cagno, E., Guido, M. J. L., Perotti, S & Zorzini, M. (2011). The impact of green supply chain practices on company performance: the case of 3PLs, *Lancaster University Management School Working Paper*, pp 1-31.
- Carter, C. R. & Ellram, L. M. (1998). Reverse Logistics: A review of the literature and framework for future investigation, *Journal of Business Logistics*, 19(1),85-102.
- Cavinato, J. L. (1992). A total cost/value model for supply chain competitiveness, *Journal of Business Logistics*, 13, 2, 285-301.
- Chege, T. (2012). The effect of environmental impact consideration on Procurement Decisions of Kenya Electricity Generating Company. *International Journal of Social Sciences and Entrepreneurship*, 1 (12) 317-339.
- Chouinard, M., D., Amours, S. & Ait-Kadi, D. (2005). Integration of reverse logistics activities within a supply chain information system. *Computers in Industry*, 56, 105–124.
- Cooper, R. K. (1997). Applying emotional intelligence in the workplace. *Training and Development Journal* 51, 31-3

- Da Silveira, G. J. C. & Arkader, R. (2007). The direct and mediated relationships between supply chain coordination investments and delivery performance. *International Journal of Operations & Production Management*, 27(2),140-158.
- Daugherty, P., Matthew B. M. & Richey, R. G. (2002). Information Support for Reverse Logistics: The influence of Relationship Commitment. *Journal of Business Logistics*, 23, 85-106.
- Dekker, R., Fleischmann, M., Inderfurth, K. & Van Wassenhove, L. N. (2004). *Reverse Logistics: Quantitative Models for Closed-Loop Supply Chains*. Berlin: Springer.
- DiMaggio, P. J. & Powell, W. W. (2011). The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields, *American Sociological Review* 48(2): 147-60.
- Donaldson, T. & Preston, L. E. (2003). The Stakeholder Theory of the Corporation: Concepts, Evidence, and Implications. *Academy of Management Review* 20(1): 65-91.
- Drumwright, M. (1994). Socially Responsible Organisational Buying: Environmental Concern as a Noneconomic Buying Criterion, *Journal of Marketing* 58.8: 1-19.
- Fleischmann, M., Beullens, P., Bloemhof-Ruwaard, J. M. & Van Wassenhove, L. N. (2001). The impact of product recovery on logistics network design. *Production & Operations Management*, 2(3),7-18.
- Friedman, A. L. & Miles, S. (2002). Developing Stakeholder Theory. *Journal of Management Studies*, 39(1), 1-21.
- Gosain, S., Malhotra, A. & El Sawy, O. A., (2004). Coordinating for flexibility in eBusiness supply chains, *Journal of Management Information Systems*, 21(3), 7-45.
- Government of Kenya (2007). *The Kenya Vision 2030*. Nairobi: Government Printer.
- Green, K., Morton, B & New, S. (2006). Purchasing and environmental management: interactions, policies and opportunities. *Business Strategy and the Environment*, 5(3), 188-197
- Gunasekaran, A., Lai, K. H. & Cheng, T. C. E. (2008). Responsive supply chain: a competitive strategy in the networked economy, *Omega*, 36 (4), 549-564.
- Hall, J. (2003). *Environmental supply chain innovation*, Greening of the Supply Chain, Greenleaf.

- Hamner, R., Oremus, M., Constantine, R. & Baker, C.S. (2012). *Estimating the abundance and effective population size of Maui's dolphins using microsatellite genotypes: 2010–11*. Report to Auckland Conservancy, Department of Conservation.
- Handfield, R., Sroufe, R. & Walton, S. (2005). Integrating environmental management and supply chain strategies business strategy and environment. *Journal of Business Logistics*, 14(1),1 -19.
- Handfield, R. B. & Nichols, E. L. (2009). *Supply chain redesign: transforming supply chains into integrated value systems*. Upper Saddle River, NJ: Financial Times Prentice Hall.
- Helms, J. E., Lewis, R., Mobilio, L., Perry, D. & Raman, N. (2002). Viral marketing or electronic word-of-mouth advertising: Examining consumer responses and motivations to pass along email. *Journal of Advertising Research*, 44(2), 333–348.
- Hokey, M. & William, G. (2011). Green purchasing practices of US firms International, *Journal of Operations & Production Management*, 21(9), :1222-1238.
- Jansen, B. J., Booth, D., & Spink, A. (2009). Determining the informational, navigational, and transactional intent of Web queries. *Information Processing & Management Journal*, 44(3), 1251–1266.
- K'obonyo, P. (1999). *Complying with Business Regulation in Kenya*. University of Nairobi: Institute for Development Studies Occasional Paper No. 64.
- KIM. (2000). *Fundamental of Management Research Methods*. Nairobi: Moran (E.A) Publishers Limited
- Knudsen, H. K. (2003). *Absorptive capacity and organizational innovation: Results from the National Treatment Center Study*. Presentation at the annual meeting of the Southern Sociological Society. New Orleans, LA, March 28.
- Korir, T. (2014). International Tourism in Kenya: Development, Problems and Challenges. *Eastern Africa Social Science Research Review*, 16 (2): 49-70.
- Kothari C. R. (2008). *Research Methodology. Methods and Techniques* (2nd ed.). NewDelhi: New Age International.
- Koufteros, X., Cheng, T. C. E. & Lai, K. H. (2007). Black-box and gray box supplier integration in product development; antecedents, consequences and the moderating role of firm size, *Journal of Operations Management*, 25 (4), 847-870.
- Koufteros, X., Vonderembse, M. & Jayaram, J., (2005). Internal and external integration for product development: *Journal of Operations Management*, 25 (4), 847-870.

- Kruger, D. J. (2003). Integrating quantitative and qualitative methods in community Research, *The Community Psychologist*, 36,18-19.
- Lai, K. H., Wong, C. W. Y. & Cheng, T. C. E. (2010). Bundling digitized logistics activities and its performance implications, *Journal Industrial Marketing Management*, 39 (2), 273-286.
- Lai, K. H. & Cheng, T. C. E. (2009). *Just-in-Time Logistics*, Gower Publishing, Farnham, England.
- Lamming, R & Hampson, J. (2006). The environment as a supply chain management issue, *British Journal Management*, 7(2), 45-62.
- Large, O. & Thomsen, G., (2011). Drivers of green supply management performance: Evidence from Germany, *Journal of Purchasing & Supply Management*, Vol. 17, No.3, pp. 176- 184.
- Legner, C. & Schemm, J. (2008). Toward the inter-organizational product information supply chain –evidence from the retail and consumer goods industries. *Journal of the Association for Information Systems*, 9(3/4), 119-150.
- Lembke, B., Hu, M. & Cheng, J. (2012). *Opinion observer: Analyzing and comparing opinions on the Web*. In A. Ellis & T. Hagino (Chairs), Proceedings of the 14th International Conference on World Wide Web (WWW '05)(342–351). New York: ACM Press
- Malone, T. W. & Crowston, K. (1994). The interdisciplinary study of coordination. *ACM Computing Surveys*,26(1),87-120.
- Mentzer, J. T. (2001). Managing Channel Relations in the 21st Century, *Journal of Business Logistics*, Vol. 14, No. 1, 27-42.
- Meyer, J. W. & Rowan, B. (2007). Institutionalized organizations: Formal structure as myth and ceremony. *American Journal of Sociology*, 83, 340–363.
- Min, H. & Galle, P. W. (2006). Green Purchasing Strategies :Trends and Implications, *International Journal of Purchasing and Materials Management*, 33(2),11-17.
- Mollenkopf, D. A. & Closs, D. J. (2005). The hidden value in reverse logistics. *Supply Chain Management Review*, 9, 34–43.
- Morton, J., Meehan, K. & Richards, A. (2012). Corporate social responsibility: the 3C-SR model, *International Journal of Social Economics*, 33 (5/6), 386-98.

- Mota, J. & de Castro, L. M. (2004). A capabilities perspective on the evolution of firm boundaries: a comparative case example from the Portuguese moulds industry. *Journal of Management Studies*, 41(2), 295-316
- Mugenda, O. M. & Mugenda A. G. (1999). *Research methods and quantitative and qualitative approaches*. Nairobi: African Center for Technology studies (ACTS) press.
- Obong'o S. O. (2009). Implementation of Performance Contracting in Kenya. *International Public Management Review*, 10(2), 19-45.
- Octavio, B. T. (2007). *An investigation of green supply chain management in the construction industry in the UK*. School of Environmental Sciences University of East Anglia.
- Oncu, H. (1994). *Egitimde ölçme ve değerlendirme (Measurement and evaluation in education)*. Ankara: Matser Basım
- Orodho, A. J. & Kombo D. K. (2002). *Research Methods*. Nairobi: Kenyatta University, Institute of Open Learning.
- Ottaman, J. A. (1993). *Green Marketing: Challenges and Opportunities*. NTC: Lincolnwood.
- Phillips, R. & Freeman, R. E. (2003). *Stakeholder Theory and Organizational Ethics*: Berrett-Koehler Publishers.
- Poist, R. F. (2000). Development and implementation of reverse logistics programs. *Transportation Journal*, 39, 54
- Preuss, L. L. (2012). Green light for greener supply, *Business Ethics: A European Review*, 11 (4), 308-17.
- Qu X. D., Tang, T., Xie, Z. C. Ye, L. Li D. F. & Cai, Q. H. (2007). Distribution of the macro-invertebrate communities in the Xiangxi River system and relationships with environmental factors. *Journal of Freshwater Ecology*, 20(2): 233-238.
- Rao, P & Holt, D. (2005). Do green supply chains lead to competitiveness and economic performance? *Journal of Operations & Production Management*. 25, 9 898 –916.
- Robert, K. (2008). Rede ning innovation: Eco-innovation research and the contribution from ecological economic. *Ecological Economics*, 32, 319 332.
- Robson, C. (2002). *Real World Research*. Blackwell, 2nd edition
- Scott, W. R. (2001). *Institutions and Organizations*. Thousand Oaks, CA: Sage.

- Simchi-Levi, D., Kaminsky, P. & Simchi-Levi, E. (2009). *Designing and managing the supply chain: concepts, strategies, and case studies*. 3rd ed. Mc Graw Hill, New York. 498 p.
- Singh, N., Lai, K. H. & Cheng, T. C. E., (2007). Intra-organizational perspective on IT-enabled supply chains, *Journal on Communications of the ACM*, 50 (1), 59-65
- Srivastava, S. K. & Srivastava, R. K. (2005). Profit driven reverse logistics. *International Journal of Business Research*, 4, 53–61.
- Stevens, M. (2002). An integrated logistics operational model for green supply chain management. *Transportation Research*, 41 (4), 287-313.
- Stock, J. R. (1998). Development and Implementation of Reverse Logistics Programs. *Council of Logistics Management Journal*, 4(1),295-316.
- Stonebraker, P. W. & Liao, J. (2006). Supply chain integration: exploring product and environmental contingencies, *Supply Chain Management: An International Journal*, 11(1), 34-43.
- Tan, K. C., & Kannan, J. D. (2005). A study of operations management constructs and their relationships. *International Journal of Operations & Production Management*, 23(12), 1300-1325.
- Theyel, G. (2011). Management practices for environmental innovation and performance. *International Journal of Operations & Production Management*, 20(2), 249-266.
- Thierry, M., Salomon, M., Nunnen, J. & Wassenhove, L. (1995). Strategic issues in Product Recovery Management. *California Management review*, 37(2), 114-135.
- Tibben-Lembke, R. S. (2002). Life after death: reverse logistics and the product life cycle. *International Journal of Physical Distribution & Logistics Management*, 32, 223–244.
- United Nations Development Programme – UNDP (2008). Country Programme Action Plan of the Government of Kenya 2006 Annual Work Plan
- Wadhwa, S., & Madaan, J. (2004). Role of Quality Management Self-Assessment Model to Promote Reverse Logistics Operations. Bangkok: *International Conventions on Quality Control Circles*, 9, 34–43.
- Welling, B. & Chavan, A. S. (2010). Analyzing the Feasibility of Green Marketing in SME`s, *Asia-Pacific Journal of Research in Business Management*, 1, (2).

- Wong, C. W. Y., Lai, K. H. & Cheng, T. C. E. (2009). Complementarities and alignment of information systems management and supply chain management, *International Journal of Shipping and Transport Logistics*, 1 (2), 156-171.
- Yeung, A. C. L., Lai, K. H. & Yee, R. W. Y. (2007). Organizational learning, innovativeness and organizational performance: a qualitative study, *International Journal of Production Research*, 45 (11), 2459-2477.
- Zhu, Q. & Sarkis, J. (2011). An inter-sectorial comparison of green supply chain management in China: drivers and practices. *Journal of Cleaner Production*, 14(5), 472-86.
- Zhu, Q., Sarkis, J., & Geng, Y. (2009). Green supply chain management in China: pressures, practices and performance, *International Journal of Operations and Production Management*, 25, pp 449–468.
- Zsidisin, G. A. and Hendrick, T. E. (1998). Purchasing's involvement in environmental issues: a multi-country perspective. *Industrial Management & Data Systems*, 7, 313-320

APPENDICES

Appendix I : Questionnaire

Introduction

I am an MBA (Strategic Management) student at Egerton University. The purpose of this questionnaire is to gather the information on the Effect of Green Supply Chain Management on Manufacturing Firms in Nairobi County. The information provided for this research will be purely for academic purposes and will be treated with utmost confidentiality. The reaserch will be carried out from March 2014 to March 2015.

Part A: Background Information

1. Name of the organization.....
2. Sector
3. Designation
4. Age (Yrs.)

46 and Above	<input type="checkbox"/>	36-45	<input type="checkbox"/>
26-35	<input type="checkbox"/>	Below 25	<input type="checkbox"/>
5. Level of education

Postgraduate	<input type="checkbox"/>	Undergraduate	<input type="checkbox"/>
Diploma	<input type="checkbox"/>	Certificate	<input type="checkbox"/>

Any other, specify.....
6. Number of years in service (specifically in manufacturing firms)

Over 20	<input type="checkbox"/>	10-19	<input type="checkbox"/>
1-9	<input type="checkbox"/>	Below 1	<input type="checkbox"/>
7. Gender

Male	<input type="checkbox"/>	Female	<input type="checkbox"/>
------	--------------------------	--------	--------------------------

Part B: Green Purchasing

1. Please indicate the extent to which you agree that each of the statements describes your Firm by ticking (√) in the appropriate box from 1-5 where, 1=Strongly disagree, 2= Disagree, 3= Neutral, 4= Agree and 5= Strongly agree

		1	2	3	4	5
i	There is a reduction in the waste of resources					
ii	The firm is able to minimize cost					
iii	There is increased percentage of environmental innovations					
iv	This practice promotes recycling and reclamation of purchased materials					
v	The practice integrates suppliers in a participative decision-making process					
vi	The practice integrates suppliers in a participative decision-making process					
vii	Promotion of environmental innovation is achieved					
viii	This is an important way to promote the development of green procurement					
ix	Green purchasing can improve a firm's economic position					
x	There is improved organizational public image					

Part C: Green Reverse Logistics

1. Please indicate the extent to which you agree that each of the statements describes your Firm by ticking (√) in the appropriate box from 1-5 where, 1=Strongly disagree, 2= Disagree, 3= Neutral, 4= Agree and 5= Strongly agree

		1	2	3	4	5
i	There is improved overall quality					
ii	The organization has management of green reverse flow					
iii	Product lifecycle offers a valuable source of insight about the changing needs					
iv	There are more powerful customers					
v	There is increased multichannel retailers					
vi	The reverse logistics channels used seem to have received minimal attention					
vii	Efficiency, accuracy and timeliness in reverse supply chains activities are a priority					

viii	There is more strategic focus on reverse logistics					
ix	Sorting and Recycling are an important mechanism					
x	Collection schemes should be classified according to materials					

Part D: Green Marketing

4. Please indicate the extent to which you agree that each of the statements describes your Firm by ticking (√) in the appropriate box from 1-5 where, 1=Strongly disagree, 2= Disagree, 3= Neutral, 4= Agree and 5= Strongly agree

		1	2	3	4	5
i	The organization has a social responsibility					
ii	The firm is able to meet customer expectations					
iii	The practice provides more information externally					
iv	The practice builds new relations across the supply chain					
v	The firm is able to survive in the green competitive world					
vi	Green marketing supports green manufacturing since it is customer or demand focused					
vii	Firms are able to develop their own positive efforts to be more socially responsible					
viii	The firm is able to meet customer expectations for more environmentally conscious products					
ix	This practice has led to new relations across the supply chain					
x	Governments should take necessary steps and encourage the manufacture of green products.					

Part E: Green Risk Management

1. Please indicate the extent to which you agree that each of the statements describes your Firm by ticking (√) in the appropriate box from 1-5 where, 1= Strongly disagree, 2= Disagree, 3= Neutral, 4= Agree and 5= Strongly agree

		1	2	3	4	5
i	The organization has a social responsibility					
ii	The firm is able to meet customer expectations					

iii	The practice provides more information externally					
iv	The practice builds new relations across the supply chain					
v	The firm is able to survive in the green competitive world					
vi	Environmental issues are becoming an intrinsic part of supply chain risk management					
vii	Organizations are integrating their supply chains risk management department to reduce operating costs					
viii	Organizations are integrating their supply chains risk management department to improve their customer service.					
Ix	The primary driving force to green risk management is an urge to meeting regulations					
x	The effectiveness of green purchasing depends on whether the firm has centralized or decentralized decision-making,					

Part F: Organizational Performance

Please indicate how each of the following aspects of performance have changed in your organization by ticking (√) in the appropriate box from 1-5 where, 1= Very much decreased, 2= Decreased, 3= Not changed, 4= Increased 5= Very much increased

		1	2	3	4	5
i	Customer satisfaction					
ii	Profitability					
iii	Market share					
Iv	Sales volume					

Thank you for your participation.

Appendix II: Manufacturing Companies in Nairobi County

Energy Sector

1. East Africa Cables
2. Kenwest Cables Ltd
3. Virtual City Ltd
4. Miesec Ltd
5. International Energy Technik Ltd
6. Tea Vac Machinery Ltd
7. Mecer East Africa Ltd
8. Holman Brothers (E.A) Ltd
9. Specialized Power
10. Systems Ltd
11. Metlex Industries Ltd
12. IberaAfrica Power (E. A) Ltd
13. Synergy-pro
14. Marshall Fowler
15. (Engineers) Ltd
16. Frigorex East Africa Ltd
17. Sollatec Electronics Ltd
18. Manufacturers and
19. suppliers Ltd
20. Eveready East Africa Ltd
21. Socabelec E. A
22. Digitech East Africa Ltd
23. Power Engineering
24. International Ltd
25. Sanyo Armo K Ltd
26. Centurion Systems Ltd
27. Pentagon Agencies
28. Reliable Electricals
29. Engineers Ltd
30. Assabloy E.A Ltd
31. PCTL Automation Ltd
32. Power Technics Ltd
33. A.I Records Kenya Ltd
34. Optimum Lubricants
35. Libya Oil Kenya Ltd
36. Amedo Centre Kenya Ltd
37. nationwide Electricals
39. Kenya Shell Ltd
38. Industries Ltd
40. Aucma Digital Technology Ltd
41. Mustek East Africa
42. Kenya Scale Co. Ltd
43. Avery (EA) Ltd
44. Modulec Engineering Systems Ltd
45. Kenya Power
46. Baumann Engineering Ltd
47. Kenwestal Works Ltd
48. Assabloy East Africa Ltd

Chemical Sector

1. Anffi Kenya Ltd
2. Maroo Polymers ltd
3. Imaging solutions ltd
4. Basco Products Ltd
5. Match masters ltd
6. Interconsumer products
7. Bayer E.A Ltd
8. United chemicals Industries ltd
9. Odex chemicals
10. Continental Products Ltd
11. Oasis Ltd
12. Osho Chemicals
13. industries ltd
14. Cooper Brands Ltd
15. Romorth E.A ltd
16. Polychem E.A ltd
17. Cooper Kenya Ltd
18. Sadolin Paints E.A ltd
19. Procter and gamble E. A
20. Beiersdorf E.A Ltd
21. Sara Lee Kenya ltd
22. PZ Cussons ltd
23. Blue ring products ltd
24. Saroc ltd
25. Rayal trading co.ltd
26. BOC Kenya ltd
27. Superform ltd
28. Reckitt Benckiser E. A
29. Buyline industries ltd
30. Henkel Kenya Ltd
31. Reolutions stores co. ltd

- | | | |
|---------------------------------------|---|---|
| 32. Carbacid (CO2) Ltd | 33. Crown berger Kenya Ltd | 34. Strategic Industries Ltd |
| 35. Chemicals and solvent E. A | 36. Crown gases ltd | 37. SupaBrite Ltd |
| 38. Coates and brothers E. A | 39. Decase chemicals ltd | 40. Unilever Kenya Ltd |
| 41. Magadi soda co.ltd | 42. Deluxe inks ltd | 43. Murphy chemicals E. A |
| 44. Coils product K Ltd | 45. E.A heavy chemicals ltd | 46. Syngenta E.A Ltd |
| 47. Colgate Palmolive E. A | 48. Elex products ltd | 49. Synresins Ltd |
| 50. Johnsons Diversy E. A | 51. European perfumes and | 53. Tri- Clover Industries K |
| 55. Keel chemicals ltd | 52. cosmetics | 54. Ltd |
| 58. Kemia international ltd | 56. Galaxy paints and coatings ltd | 57. Twiga chemicals industries ltd |
| 61. Kennat Ink &chemicals ltd | 59. Grand paints | 60. Vita form products Ltd |
| | 62. Desbro Kenya Ltd | 63. Soilex chemicals Ltd |

Food and Beverage Sector

- | | | |
|--|------------------------------------|---|
| 1. Africa spirits ltd | 2. Annum trading company | 3. Premier Flour mills ltd |
| 4. Agriners Agricultural Devt Ltd | 5. Aquamist Ltd | 6. Premier foods industries |
| 8. Belfast Millers | 9. Brookside Diary ltd | 7. ltd |
| 11. Bidco Oil refineries | 12. Candy Kenya ltd | 10. Proctor & Allan E. A |
| 14. Bio foods products ltd | 15. Capwell industries | 13. Promasidor Kenya ltd |
| 17. Breakfast cereal co. ltd | 18. Carlton products E. A | 16. Trufoods ltd |
| 20. British American tobacco | 21. Chirag Kenya ltd | 19. UDV Kenya ltd |
| 23. Broadways Bakery | 24. E & A industries | 22. Unga group ltd |
| 26. C. Czarnikow Sugar E.A | 27. Kakuzi ltd | 25. Usafi services ltd |
| 29. Cadbury Kenya ltd | 30. Erdemann co. ltd | 28. Uzuri foods ltd |
| 32. Centro Food industries | 33. Excel chemicals | 31. Value pak foods ltd |
| 35. Coca cola E.A Ltd | 36. Kenya wine agencies ltd | 34. W.E Tilly Muthaiga ltd |
| 38. Confec industries Ltd | 39. Highlands canners | 37. Kevian Kenya ltd |
| 41. Corn products Kenya ltd | 42. Supa bakery ltd | 40. Koba waters ltd |
| 44. Crown foods ltd | 45. Sunny processor ltd | 43. Kwality candies & sweets ltd |
| | | 46. Lari dairies alliance ltd |

- | | | |
|--|---|---|
| 47. Cut tobacco ltd | 48. Spin knit dairy ltd | 49. London distillers
Kenya ltd |
| 50. Deepa industries | 51. Highlands mineral
water co. Ltd | 52. Mafuko industries |
| 53. Deepa industries
Monte | 55. Home oil | 56. Manji food industries
ltd |
| 54. Kenya ltd | 58. Insta products (EPZ)
Ltd | 59. Melvin Marsha
international |
| 57. East Africa breweries
ltd | 61. Jumbo biscuits K ltd | 62. Kenya tea
development |
| 60. East Africa food ltd | 65. Jetlag foods ltd | 63. Agency |
| 64. Eastern produce
Kenya ltd | 68. Mariana estates ltd | 66. Mini bakeries Nbi ltd |
| 67. Farmers choice ltd | 71. Kenafric industries
Ltd | 69. Martini Kenya ltd |
| 70. Frigorex ltd | 74. Kenblest Ltd | 72. Mount Kenya bottlers |
| 73. Giloil co. ltd | 77. Kenya breweries ltd | 75. Nairobi bottlers |
| 76. Glacier products ltd | 80. Kenya nut co. ltd | 78. NAS airport services |
| 79. Global allied
industries ltd | 83. Kenya sweets ltd | 81. Rafiki millers |
| 82. Global beverages ltd | 86. Nestle Kenya | 84. Razco Ltd |
| 85. Global fresh ltd | 89. Nicola farms ltd | 87. Re- sun spices ltd |
| 88. Gonas best ltd | 92. Palm house dairies | 90. Smash industries |
| 91. Hail & cotton
distillers ltd | 95. Patco industries | 93. Softa bottling co. ltd |
| 94. Al- mahra industries
ltd | 98. Pearl industries | 96. Spice world ltd |
| 97. Alliance one tobacco
ltd | 101. Pembe Flour
mills ltd | 99. Nairobi flour mills |
| 100. Alpha fine
foods ltd | | 102. Wrigley
company E. A |
| 103. Alpine
coolers ltd | | |

Plastic and Rubber

- | | | |
|--|---------------------------------------|---|
| 1. Betatrad K ltd | 2. Prestige Packaging
ltd | 3. Haco industries ltd |
| 4. Blowpost Ltd | 5. Prosel Ltd | 6. Hi- plast ltd |
| 7. Bobmil industries ltd | 8. Qplast Industries | 9. Jamlam industries ltd |
| 10. Complast industries
ltd | 11. Sumaria industries
ltd | 12. Kamba manufacturing
Ltd |
| 13. kentainers ltd | 14. Treadsetters tyres ltd | 15. Nairobi plastics
industries |
| 16. King plastic
industries | 17. Super manufacturers
ltd | 18. Nav plastics |
| 19. Kings way tyres &
Automart ltd | 20. Uni-plastics ltd | 21. Ombi rubber |

- | | | |
|---------------------------------|---------------------------------|----------------------------|
| 22. L.G Harris & co. Ltd | 23. Wonderpac industries ltd | 24. Packaging masters ltd |
| 25. Laneeb plastics industries | 27. ACME containers ltd | 28. Plastics electronics |
| 26. ltd | | |
| 29. Metro plastics ltd | 30. Afro plastics Kenya ltd | 31. Raffia bags k ltd |
| 32. Ombi rubber rollers ltd | 33. Alanker industries ltd | 34. Rubber products ltd |
| 35. Packaging industries ltd | 36. Dune packaging ltd | 37. Safepak ltd |
| 38. Plastic & rubber industries | 40. Elgitread Kenya ltd | 41. Sameer Africa ltd |
| 39. ltd | | |
| 42. Polyblend ltd | 43. Elgon Kenya ltd | 44. Sanpac Africa ltd |
| 45. Poly flex industries ltd | 46. Eslon plastics of Kenya Ltd | 47. Silpack industries ltd |
| 48. Polythene industries ltd | 49. Five star industries ltd | 50. Solvochem E. A |
| 51. Premier industries ltd | 52. General plastics ltd | 53. Springbox Kenya ltd |

Building Sector

- | | | |
|---------------------------------|----------------------------------|--------------------------|
| 1. Central Glass Industries Ltd | 2. Kenbro Industries Ltd | 3. Manson Hart Kenya Ltd |
| 4. Karsanmurji & Co Ltd | 5. Kenya Builders & Concrete Ltd | 6. Mombasa Cement Ltd |

Paper Sector

- | | | |
|--------------------------------------|--|-----------------------------------|
| 1. Ajit Clothing Factory Ltd | 2. Paper House of Kenya Ltd | 3. Green Printers Ltd |
| 4. Associated Paper & Stationery Ltd | 6. Paper Bags Ltd | 7. Graphics & Allied Ltd |
| 8. Autolitho Ltd | 9. Primex Printers Ltd | 10. Guaca Stationers |
| 11. Bag & Envelop Converters | 12. Print Exchange Ltd | 13. Icon Printers |
| 14. Bags & Balers | 16. Printpak Multi Packaging Ltd | 17. Interlabels Ltd |
| 15. Manufacturers | 19. Printwell Industries | 20. Jomokenyatta Foundation |
| 18. Brand Printers | | 24. Karatasi Industries |
| 21. Business Forms And Systems Ltd | 23. Prudential Printers | |
| 25. Carton Manufacturers | 26. Punchline Ltd | 27. Kenafic Diaries Manufacturers |
| 28. Cempack Ltd | 29. Conventional Franciscan Friars Kolbe Press | 30. Kitabu Industries |
| 31. Chandaria Industries | 32. Creative Print House | 33. Kul Graphics Ltd |

- | | | |
|----------------------------|---------------------------------|-------------------------------|
| 34. Colour Labels | 35. D.L Patel Press K Ltd | 36. Modern Lithographic Ltd |
| 37. Colour Packaging Ltd | 38. Dodhia Packaging | 39. Pan African Paper Millers |
| 40. Colour Print Ltd | 41. EA Packaging Industries Ltd | 42. Ramco Printing Works |
| 43. Kenya Stationers Ltd | 44. Elite Offset Ltd | 45. Regal Press Ltd |
| 46. Kim Fay E. A | 47. Ellams Products Ltd | 48. Sig Combiblocsobeikan |
| 50. Paper Converters K Ltd | 51. English Press Ltd | 49. Kenya |
| | | 52. Label Converters |

Textile Sector

- | | | |
|--------------------------------|-------------------------------|------------------------------|
| 1. Africa Apparels Epz | 2. Kenya Trading Epz Ltd | 3. Spinners and Spinners Ltd |
| 4. Fulchandmanek& Bros | 6. Kikoy Co Ltd | 7. Storm Apparel |
| 5. Ltd | | 8. Manufacturers |
| 9. Image Apparels | 10. Le Stud Ltd | 11. Straightlineentrprises |
| 12. Alltex Epz Ltd | 13. Metro Impex Ltd | 14. Sunfalg Textile & |
| | | 15. Knitwear Mills Ld |
| 16. Alpha Knits Ltd | 17. Midco Textiles E.A Ltd | 18. Tarpo Industries Ltd |
| 19. Apex Apparels Epz | 20. Mirage Fashion Ware Epz | 21. Teita Estates Ltd |
| 22. Baraka Apparels Epz | 23. Mrc Nairobi Epz | 24. Thika Cloth Mills |
| 25. Bhupco Textiles Mills Ltd | 26. Ngeecha Industries | 27. United Aryan Epz |
| 28. Blue Plus Ltd | 29. Premier Knit Wear | 30. Upanwasana Epz |
| 31. Bogani Industries Ltd | 32. Protex Kenya Epz | 33. Vaja Manufacturers Ltd |
| 34. Brother Shirts Factory Ltd | 35. Riziki Manufacturers Ltd | 36. Yoohan Kenya Epz |
| 37. Embellishments Ltd | 38. Rolex Garments Epz Ltd | 39. Yu-Un Kenya Epz Ltd |
| 40. Jar Kenya Epz | 41. Silver Star Manufacturers | |

Timber and Wood Products Sector

- | | | |
|---------------------------|--------------------------------------|------------------------------------|
| 1. Economic Housing Group | 3. Tran Paper Kenya Ltd | 4. Wood Makers Kenya Ltd |
| 2. Ltd | | |
| 5. Eldema Kenya Ltd | 6. Twiga Stationers and Printers Ltd | 7. Woodtex Kenya Ltd |
| 8. Fine Wood Works Ltd | 9. Uchumi Quick Suppliers | 10. United Bags Manufacturers' Ltd |

- | | | |
|---|---|----------------------------------|
| 11. Furniture
International Ltd | 12. Rosewood Office
Systems Ltd | 13. Statpack Industries |
| 14. Hwan Sung
Industries | 15. Shah Timber Mart
Ltd | 16. Taws Ltd |
| 17. Kenya Wood Ltd | 18. Slumber Land Kenya
Ltd | 19. Tetrapak Ltd |
| 20. Newline Ltd | 21. Timsales Ltd | 22. Shamco Industries Ltd |
| 23. PG Bison Ltd | | |

Metals and Allied Sector

- | | | |
|--|---|--|
| 1. Allied and Metal
Services | 3. Morris & Co Ltd | 4. Khetshidharamshi & Co
5. Ltd |
| 2. Ltd | 7. Nail and Steel
Products | 8. Nampak Kenya Ltd |
| 6. Alloy Street Castings
Ltd | 11. Orbit Engineering
Ltd | 12. Napro Industries Ltd |
| 9. Apex Street Ltd-
Rolling | 14. Rolmil Kenya Ltd | 15. Specialized Engineers
EA Ltd |
| 10. Mill Division | 17. Sandvik Kenya Ltd | 18. Steel Structures Ltd |
| 13. ASL Ltd | 20. Sheffield Steel
Systems Ltd | 21. Steel Makers Ltd |
| 16. ASP Company Ltd | 23. Booth Extrusions Ltd | 24. Steel Wool Africa Ltd |
| 19. E.A Foundary Works
Ltd | 27. City Engineering
Works Ltd | 28. Tononoka Steel Ltd |
| 22. Elite Tools Ltd | 31. Crystal Industries
Ltd | 32. Welding Alloys Ltd |
| 25. Friendship Container | 34. Davis & Shirliff Ltd | 35. Wire Products Ltd |
| 26. Manufacturers | 37. Devki Steel Mills | 38. Vikings Industries Ltd |
| 29. General Aluminum | 40. East Africa Spectre
Ltd | 41. Warren Enterprises Ltd |
| 30. Fabricators Ltd | 43. Kens Metals
Industries Ltd | |
| 33. Gopitech Kenya Ltd | | |
| 36. Heavy Engineering
Ltd | | |
| 39. Insteel Ltd | | |
| 42. Metal Crown Ltd | | |

Pharmaceutical and Medical Equipment

- | | | |
|--|--|---|
| 1. Alpha Medical
Manufacturers | 2. Madivets Products
Ltd | 3. KAM Industries |
| 4. Beta Healthcare | 6. Novelty
Manufacturing Ltd | 7. KAM Pharmacy Ltd |
| 5. International Ltd | 9. Oss Chemie K | 10. Pharmaceutical |
| 8. Biodeal Laboratories
Ltd | 13. Dawa Ltd | 11. Manufacturing Co |
| 12. Bulks Medical
Equipment | 16. Elys Chemical
Industries | 14. Regals Pharmaceutical |
| 15. Cosmos Ltd | | 17. Universal Corporation
Ltd |

18. Laboratory & Allied
Ltd
21. Manhar Brothers K
Ltd

19. Gesto
Pharmaceuticals
22. GlaxoSmithKline
Kenya Ltd

20. Pham Access Africa
Ltd

Leather Products and Footwear

1. Alpharama Ltd
4. Bata Shoe Co. Ltd
8. New Market Leather
9. Factory

2. C & P Shoe
Industries Ltd
5. CP Shoes
10. Dogbobs Ltd

3. East Africa Tanners K
Ltd
6. Leather Industries Of
7. Kenya Ltd

Motor Vehicle Assembly and Accessories

1. Auto Ancillary Ltd
4. Varsanibrakeling Ltd
7. Bhachu Industries
10. Chui Auto Springs
11. Industries Ltd
14. Toyota East Africa
17. Unifilters

2. General Motors' East
Africa
5. Impal Glass
Industries
8. Kenya Grange
Vehicle Industries
12. Kenya Vehicle
Manufactures Ltd
15. Labh Singh Harman
Singh
18. Mann Manufacturing

3. Megh Cushion
Industries
6. Mutsimoto Motor Co.
Ltd
9. Pipe Manufacturers
Ltd
13. Sohansons Ltd
16. Theevan Enterprises
Ltd
19.