

**GREEN SUPPLY CHAIN MANAGEMENT PRACTICES AND
PERFORMANCE OF FIRMS IN AUTOMOTIVE INDUSTRY IN
NAIROBI, KENYA**

BY:

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DECLARATION

Declaration by the Student

I declare that this is my original work and has not been presented in any institution for the award of any degree.

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Declaration by the University Supervisor

This project has been submitted with my authority as the University Supervisor

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DEDICATION

I dedicate this project to my family, friends, colleagues and the entire School of Business, University of Nairobi for their support.

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I thank God for giving me strength, good health and guidance throughout my studies. My sincere gratitude goes to the University of Nairobi for giving me an opportunity to pursue MBA Programme. I appreciate the efforts of my supervisor Mr. Ernest Akelo and my moderator Mr. Michael Chirchir for their support and guidance. I wish to acknowledge my loving parents Mr. & Mrs. John Korir, daughter Shamilla, my late grandfather who was the inspiration behind pursuing this course, my siblings and friends for their financial and moral support. I also wish to thank the firms in the automotive industry for giving me an opportunity to collect data for my research.

May God give me strength to apply whatever I have learnt for the benefit of the society.

TABLE OF CONTENTS

DECLARATION	ii
DEDICATION	iii
ACKNOWLEDGEMENT	iv
LIST OF TABLES.....	viii
LIST OF FIGURES.....	ix
LIST OF ABBREVIATIONS.....	x
ABSTRACT	xi
CHAPTER ONE: INTRODUCTION	1
1.1 Background of the Study.....	1
1.1.1 Green Supply Chain Management Practices.....	2
1.1.2 Firm Performance	4
1.1.3 Automotive Industry in Kenya.....	5
1.2 Research Problem.....	7
1.3 Objectives of the Study	9
1.4 Value of the Study.....	9
CHAPTER TWO: LITERATURE REVIEW	10
2.1 Introduction	10
2.2 Supply Chain Management	10
2.3 Green Supply Chain Management	11

2.4 Green Supply Chain Management Practices	13
2.4.1 Green Procurement Practices	13
2.4.2 Green Manufacturing Practices.....	14
2.4.3 Green Distribution Practices	15
2.4.4 Reverse Logistics Practices.....	16
2.5 Green Supply Chain Management Practices and Firm Performance	17
2.6 Challenges of Implementation of Green Supply Chain Management Practices	19
2.7 Summary of Literature review	21
2.8 Conceptual Framework	22
CHAPTER THREE: RESEARCH METHODOLOGY	23
3.1 Introduction	23
3.2 Research Design.....	23
3.3 Population of the Study.....	23
3.4 Data Collection.....	23
3.5 Data Analysis	24
CHAPTER FOUR: DATA ANALYSIS AND I NTERPRETATION	25
4.1 Introduction	25
4.2 Response Rate	25
4.3 Green Supply Chain Management Practices.....	27
4.4 Firm Performance.....	33

4.4 Relationship between Green Supply Chain Management Practices and Firm Performance.....	36
4.5 Challenges of using GSCM Practices	39
CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS.....	42
5.1 Introduction.....	42
5.2 Summary of Findings	42
5.3 Conclusions	44
5.4 Recommendations	44
5.5 Limitations and Suggestions for Further Research	44
REFERENCES.....	46
APPENDICES.....	53
APPENDIX 1: RESEARCH QUESTIONNAIRE.....	53

LIST OF TABLES

Table 4.1 Designation in the company.....	26
Table 4.2 Duration of Employment.....	27
Table 4.3 Extent the firm practice Green Procurement.....	28
Table 4.4 Extent the firm practice Green Manufacturing.....	29
Table 4.5 Extent the firm practice Green Distribution.....	31
Table 4.6 Extent the firm practice Reverse Logistics.....	32
Table 4.7 Economic Performance with regards to implementation of GSCM Practices.....	33
Table 4.8 Environmental Performance with regards to implementation of GSCM Practices.....	34
Table 4.9 Intangible Performance with regards to implementation of GSCM Practices.....	36
Table 4.10 T test for Coefficients.....	37
Table 4.11 Coefficient of Determination, R^2	38
Table 4.12 f test for the full model- ANOVA TABLE.....	38
Table 4.13 Challenges faced in practicing Green Supply Chain Management Practices.....	39

LIST OF FIGURES

Figure 2.1 Conceptual Framework.....	22
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LIST OF ABBREVIATIONS

GSCM: Green Supply Chain Management

EM: Environmental Management

CMC: Cooper Motor Corporation

GM: General Motors

TAM: Trans Africa Motors

AVA: Associated Vehicle Assembly

KVM: Kenya Vehicle Manufacturers

NEMA: National Environmental Management Authority

SCM: Supply Chain Management

CSR: Corporate Social Responsibility

JIT: Just In Time

TQM: Total Quality Management

ABSTRACT

This study is about the relationship between Green Supply Chain Management Practices and firm performance among firms in the automotive industry. The study had two objectives: To establish the extent of Green Supply Chain Management Practices used by firms in automotive industry in Nairobi, Kenya and the challenges faced; To establish the relationship between Green Supply Chain Management Practices and performance of firms in automotive industry in Nairobi, Kenya. The study used research design to collect data and descriptive statistics was used to analyze the data. The study focused on firms in automotive industry in Nairobi, Kenya. It found out that firms appreciate the role of Green Supply Chain Management Practices. The study also confirmed that GSCM practices are important in improving the performance of firms. The study recommends that firms should emphasize on suppliers to have ISO 14001, use life cycle assessment to evaluate environmental load, cooperate with suppliers to standardize packaging and process merchandise to improve firm performance. However, there were limitations in this study such as data collection. The firms adopt different green practices due to their structure and hence different performance of the firms. The study suggests further research to be done on how GSCM practices affect performance of firms in the services industry as well as other types of organizations such as wholesalers and retailers. In addition, the study suggests on further research on the tools and techniques required to measure the performance of firms who have adopted GSCM practices.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

There has been increasing emphasis on environment-friendly corporate activity in today's business world and many progressive companies are embracing green supply chain management. The rise in greenhouse emissions and pollution of the environments by firms has precipitated the need for organizations to realign their supply chain operations with a view of conserving the scarce resources. Green supply Chain Management (GSCM) is an approach to improve performance of the process and products according to the requirements of the environmental regulations (Hsu & Hu, 2008). As customers begin to demand that products and services be provided without damaging the environment, managers need make decisions that support the integration and coordination of environmental practices throughout the supply chain (Vachon & Klassen, 2007). Consequently, a sudden rise of environmental movements, legislations and concerns during the past decade, consensus is forming that issues of environmental pollution accompanying industrial development should be addressed together with supply chain management, thus contributing to the initiative of Green Supply Chain Management (Sheu et al., 2005).

GSCM emerges as a new systematic environmental approach in supply chain management and has been increasingly accepted and practiced by forward thinking organizations. The current environmental requirements that influenced manufacturing activities has increased attention in developing environmental management (EM) strategies for supply chain. Thus the concept of GSCM arises and becoming an important

factor for business activities today (Seman et al., 2012). Zhu et al. (2008) also claimed that GSCM can be regarded as an environmental innovation. By integrating green concept to the supply chain concept, it has created a new research agenda where supply chain will have a direct relation to the environment.

Kenya is one of the developing countries in the world and is becoming increasingly industrialized. Despite Kenya being a major manufacturing country which brings opportunities, it faces substantial burden on the environment. The multinational organizations and developed countries are using third world countries as a point for disposal of end-of-life products and this result to environmental impact (Puckett & Smith, 2002).

1.1.1 Green Supply Chain Management Practices

According to Hsu and Hu (2008), Green supply Chain Management (GSCM) is defined as an approach to improve performance of the process and products according to the requirements of the environmental regulations.

Wang and Lin (2011) defined GSCM as the improvement in environmental impact which is achieved by the management of raw materials, parts/components and processes from suppliers to manufacturers to customers. Srivastava (2007) described GSCM as integrating environment thinking into Supply Chain Management, including product design, material sourcing and selection, manufacturing process, delivery of the final product to the consumers and end-of life management of the product after its useful life. GSCM has increased an environmentally conscious mindset to supply chain management and has been introduced into many final manufacturing processes (Aref et al., 2005).

Ninlawan et al. (2010) breaks down GSCM into four components: i) Green procurement which involves the purchase of products that are environmentally friendly, ii) Green distribution which involves environmental thinking in green design, green packaging and eco-labeling, iii) Green manufacturing; involves use of inputs with relatively low environmental impacts and iv) Reverse Logistics; the process of planning, implementing and controlling the effective flow of raw materials, in process inventory, finished goods and related information from the consumer to the point of origin for the purpose of creating value.

Green Supply Chain Management practices has emerged as an important new innovation that helps organizations develop “win-win” strategies that achieve profit and market share objectives by lowering their environmental risks and impacts, while raising their ecological efficiency (Van & Hock, 2000). Green supply chain management has numerous benefits to an organization, ranging from cost reduction, to integrating suppliers in a participative decision-making process that promotes environmental innovation (Bowen et al., 2001; Hall, 2003; Rao, 2002).

However, according to Ryder Centre of Supply Chain Management (2008), there are challenges likely to be faced when practicing GSCM. These challenges include: lack of appropriate technology to support companies and their efforts to go green and business processes needed to capture the required data in the supply chain therefore making use of the existing technology, the trade-off between green requirement and lean practices and failure to integrate supply chain optimization efforts with green supply chain efforts. In addition, other challenges highlighted are standards, awareness, business case

development, sustainability program implementation and communicating to the supply chain team (Wilkerson, 2010).

1.1.2 Firm Performance

Firm performance comprises of the total economic results undertaken by an organization. The performance of any organization is affected by the choice of strategies made by the management. Strategies determine the long term performance of a firm and it may take many forms depending on whom and what measurements are meant for. Different stake holders require different indicators to enable them make informed decisions (Bahae, 1995).

The determinants of firm performance include the quality of the firm's resources, the industry characteristics and the organization's position relative to its competitors. Therefore, managers need to focus their efforts on these factors to ensure that organization's goals and objectives are realized. The performance of an organization can be conceptualized in terms of financial and non financial measures. Financial measures include measurements like Return on Investments (ROI), Return on Equity (ROE), Return on Asset (ROA), gross profit, Return on Sales (ROS), gross profit, stock price, sales growth, market share, liquidity and operational efficiency. The non financial include job satisfaction, organizational commitment and employee turnover (Ricardo, 2001).

Kaplan and Norton (2001) argued that many organizations focus on managing intangible assets like customer relationships, innovative products and services, high quality and responsive processes which are non financial in nature as opposed to tangible assets like fixed assets and inventory. The Balanced Scorecard (BSC) was developed by Kaplan and

Norton in 1992 as a strategic performance management tool to take care of shortcomings in the previous tools. BSC has four measurement perspectives namely; Financials, Customer, Internal business processes and Learning and Growth. The organizations have embraced this tool to measure performance.

Richard et al. (2009) indicated that performance encompasses three specific areas of firm outcome; financial performance, product performance and shareholders return. For this study, we shall adopt the definition that firm performance involves both financial and non-financial performance (economic) including both environmental and intangible performance.

1.1.3 Automotive Industry in Kenya

The automotive industry in Kenya contributes a lot towards the economic growth of the country and provision of employment opportunities among the Kenyan citizens. Kenya's automotive retail and distribution sector is rapidly expanding due to infrastructure development, increasing incomes and access to credit facilities (Njoroge, 2007)

The Automotive industry in Kenya is primarily involved in the retail and distribution of motor vehicles. There are a number of motor vehicle dealers operating in the country, with the most established being Toyota (East Africa), Cooper Motor Corporation (CMC), General Motors (GM), Simba Colt and DT Dobie with Honda Motors which established its operations in Kenya in January 2013 as Division of Trans Africa Motors (TAM). There are also four vehicle assembly plants in the country (i) Associated Vehicle Assemblers Ltd (AVA), Kenya (ii) Kenya Vehicle Manufacturers (KVM) (iii) General Motors East Africa (GMEA) (iv) Honda Motorcycle Kenya Ltd. They concentrate on the

assembly of pick-ups and heavy commercial vehicles. 98% of all goods imported into Kenya through the Port of Mombasa and major International Airports in the country are transported by road. The growing middle class is also driving this sector with demand for small cars and major franchises' have been set up to meet the demand.

However, the automotive industry in Kenya is facing major competition from imported vehicles from Europe and far East countries by second hand car dealers. The established dealers face intense competition from imported second-hand vehicles, mainly from Japan and United Arab Emirates. These imports account for about 70% of the market. In the last decade, there was a significant decline in the number of new vehicles sold in the country. Despite a steady recovery in the last four years, the numbers achieved still fall far short of the numbers recorded a decade ago. There has been slump in the volume of new cars sold and this has been attributed to depressed economic environment and increased competition from the second hand vehicles. The slump in the volume of new cars sold is attributable to the increased competition from second hand vehicles (opentoexport.com/article/automotive-sector-in-Kenya).

The Kenya Motor Industry Association (KMI), the representative body of the corporate participants in the motor industry, has been lobbying hard to reverse this trend. Some of the measures adopted by KMI that has helped the industry recover from its lowest point in 2000 include: implementation of strict criteria on the implementation of second hand vehicles, promoting local assembling of commercial vehicles and encouraging car manufacturers to expand their operations (www.pwc.com/ke/cn/industries/automotive.jhtml)

1.2 Research Problem

Green supply-chain management (GSCM) is gaining increasing interest among researchers and practitioners of operations and supply chain management. The growing importance of GSCM and its practices is driven mainly by the escalating deterioration of the environment, e.g. diminishing raw material resources, overflowing waste sites and increasing levels of pollution. However, it is not just about being environment friendly; it is about good business sense and higher profits. This therefore requires companies to integrate their economic and the environment.

There are a number of studies that have examined this concept of green supply chain management. For instance, Holt and Ghobadian (2009) conducted study on the GSCM practices among the UK manufacturers; Trigos (2007) focused on GSCM in the UK construction companies.

Zhu et al. (2005) observed that increasing pressures have caused the Chinese automobile supply managers consider implementation of various GSCM practices. Zhu et al. (2004) recommended that both environmental and Economic Performances are the basis for organizational performance. Lee et al. (2012) found out that, there is a direct link between GSCM practice implementation and business performance. The results indicated that business performance will be improved when GSCM enhances operational efficiency, does this also apply in Kenya in that GSCM Practices are implemented by firms.

Mohamed (2012) found out that GSCM has a positive impact on manufacturing firms in Mombasa. She recommended further research to be done in manufacturing firms in other

parts of the country as well as service sector. Obiso (2011) found out that adoption of the practices had a positive relationship with the environmental performance of oil companies in Kenya. Omonge (2012) indicated that GSCM practices had a positive relationship with the environmental performance of banks. Also Mwirigi (2007) found out that attempts to overcome environmental challenges through practicing some aspects of GSCM were evident but not indicative of full adoption of the strategy. However, these studies have not focused on the GSCM practices and their impact on overall firm performance.

In Kenya, most industries are still growing and the concept of GSCM has not been fully adopted because of the complex environmental challenges. According to NEMA, Kenya lacks infrastructure and the capacity to recycle and manage the wastes. Environmental considerations and public opinion are driving manufacturers decisions around the mix of materials used in manufacturing, the types of engine and the end of vehicle life. Automotive industry in Kenya is a sector that contributes to carbon emissions; therefore it is their responsibility to offset such emissions. The aspect of sustainability has now become an integral part of the standards that define automotive industry. It is however clear that studies of have not focused on the GSCM practices and overall firm performance that is, economical, environmental and intangible performance, also studies on performance evaluation are few. Hence there is need to conduct a study to determine how performance of the firms in the automotive industry is affected by the implementation of GSCM practices. The research will be guided by the following questions: What is the extent of GSCM practices used by firms in the automotive industry

in Nairobi, Kenya and the challenges faced? What is the relationship between GSCM practices and performance of firms in the automotive industry in Nairobi, Kenya?

1.3 Objectives of the Study

- (i) To establish the extent of GSCM practices used by firms in the Automotive industry in Kenya and the challenges faced.
- (ii) To establish the relationship between GSCM practices and performance of firms in the Automotive industry in Kenya

1.4 Value of the Study

This research project will assist the automotive industry to become more aware of integrating GSCM concept with their business processes. The management will be in a position to identify the GSCM practices that will improve the company's business performance and even mobilize their R&D department to research on production of environmentally sustainable vehicles

This study will assist the government to identify the loopholes in the existing environmental laws and regulations hence making better policies on environmental concern .The government will also come up with infrastructure to handle the disposal of wastes.

The society at large will be sensitized on the importance of conserving the environment for future. This will enable them to have more concern on buying products that are environmentally friendly.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter discusses literature on various studies in support of GSCM practices. It gives several definitions of Supply Chain Management, the concept of GSCM and its practices such as green procurement, green manufacturing, green distribution, and reverse logistics. The challenges encountered when adopting GSCM practices, organizational performance and GSCM practices has also been covered.

2.2 Supply Chain Management

Supply chain management (SCM) is a wide and new field and various authors have come up with different definitions.

SCM is the management of a network of interconnected business involved in the ultimate provision of product and service packages required by end customers. SCM spans all movement and storage of raw materials, work in progress and finished goods from point of origin to point of consumption (Hines, 2004). SCM is a set of synchronized decisions and activities utilized to efficiently integrate suppliers, manufacturers, warehouses, transporters, retailers and customers so that the right product or service is distributed at the right quantities, to the right locations and at the right time, to minimize system-wide costs while satisfying customer service level requirements. The objective of SCM is to achieve sustainable competitive advantage (Chan, 2003)

Another definition by Sarika (2004) is that SCM focuses on increasing sales, reducing expenses and making full potential of organizational resources by involving team work

and sharing of information along the supply chain. Christopher (2005) defines SCM as the management of upstream and downstream relationships with suppliers and customers to deliver superior customer value at less cost to the supply chain as a whole. SCM involves the planning and management of all activities that are involved in getting the product, processing it, creating demand, and being able to fulfill that demand and all logistic management activities (Gibson et al., 2005).

2.3 Green Supply Chain Management

The concept of Green Supply Chain Management (GSCM) has been observed as a recent and novel managerial principle. GSCM is an environmental concept that is gaining popularity in the world. For many businesses in the world, adopting GSCM is a way to demonstrate their sincere commitment to sustainability.

The lack of consensus in literature is demonstrated by the several definitions of GSCM. GSCM is a fundamental part of sustainable supply chain management, which is defined by Carter and Rogers (2008) as the strategic, transparent integration and achievement of an organization's social, environmental, and economic goals in the systemic coordination of key inter-organizational business processes for improving the long-term economic performance of the individual company and its supply chains. GSCM as a form of environmental improvement is an operational initiative that many businesses are adopting to address environmental issues (Rao & Holt, 2005). According to Zhu and Sarkis (2004), GSCM is an integrated supply chain system consisting of suppliers, manufacturers, customers and reverse logistics management. Srivastava (2007) integrates environmental thinking into supply chain management, including product design, material sourcing and selection, manufacturing processes, delivery of the final product to the consumers as well

as end-of-life management of the product after its useful life. Muller and Seurling (2008) on the other hand defined GSCM as the management of material, information and capital flows as well as cooperation among companies along the supply chain while taking goals from all three dimensions of sustainable development, that is, economic, environmental and social, into account which is derived from customer and stakeholder requirements.

GSCM has become an important issue for all types and sizes of organization rather than just conducting research for academic purposes, for example, the idea of Corporate Social Responsibility (CSR) is now fully adopted in many organizations (Emmett et al., 2010). Brown et al. (2001) suggests two main types of GSCM process: greening the supply process and product-based GSC. Greening the supply process stands for accommodations made to the firm's supplier management activities for considering environmental perspectives. On the other hand, Product based GSC focuses on changes to the product supplied and attempts to manage the by- products of supplied inputs. Whichever of the two an organization decides to consider, it is necessary that leaders of logistics and supply chain department balance low cost and innovation process while maintaining good environmental performance (Pagell et al., 2004). As a process, greening the supply process appears more reasonable since a firm extends its environmental responsibility beyond its boundaries and tries to reduce sources of waste and pollution throughout its entire supply chain. However, the product based approach does not eliminate pollutants, but merely transforms them from one medium to another. Through supply chain analysis, organizations are able to check whether environmental issues can be incorporated into industrial transformation process (Green et al., 1996).

2.4 Green Supply Chain Management Practices

According to Awaysheh and Klassen (2010), GSCM refers to a variety of activities and initiatives implemented by organization in an attempt to reduce their impact on the natural environment. These include; green procurement practices, green distribution practices, green distribution practices and reverse logistics practices.

2.4.1 Green Procurement Practices

Green procurement (GP) is defined as an environmental purchasing consisting of involvement in activities that include the reduction, reuse and recycling of materials in the process of purchasing. Besides green procurement is a solution for environmentally concerned and economically conservative business, and a concept of acquiring a selection of products and services that minimizes environmental impact (Salam, 2008). According to Holbrook (2004), GP refers to the practice of preventing waste and pollution by taking into consideration environmental impact such as price, performance and other factors when making purchasing decisions. Carter et al. (1998) defined green purchasing as: in order to facilitate reusing and recycling resource reduction, the purchasing department should participate in every activities 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 (2001) defined that green purchasing is a set of principles, methods under premise of full considering the impact on the environment.

Green procurement is the selection of goods and services that minimizes environmental impact where organizations are required to carry out an analysis of the environmental impact of a product over lifecycle (<http://www.buy-environmental.co.za/index.php/home>).

GP is also known as Affirmative Procurement. This is referred to as the purchase of products and services which are environmentally friendly. The products or services purchased should have a lower impact on the environment over their whole life cycle than the standard equivalent (Mulwa, 2010).

Zhu 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, etc. Martha and Houston (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. Hokey et al. (2001) proposed that reducing the emissions of exhaust and sewage and so on, not only is the promise 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.

2.4.2 Green Manufacturing Practices

Green Manufacturing (GM), is the system that integrates product and product design issues with issues of manufacturing, planning and control in such a manner to identify, quantify, access and manage the flow of environmental waste with the goal of reducing and ultimately minimizing environmental impact while also trying to maximize resources efficiency (Melnyk et al., 2009). Green manufacturing is defined as production process

which use inputs with relatively low environmental impacts, which are highly efficient and which generate little or no waste or no pollution. It can lead to lower raw material costs, production efficiency gains, reduced environmental and occupational safety expenses and improved corporate image (Ninlawan et al., 2010).

Green technology and Eco- innovation is one the Green manufacturing practices. It is the driver in the move towards green and low carbon economy. Many organizations view the application of green manufacturing technologies as the corner stone for their policies for economic growth (Defra, 2008).

2.4.3 Green Distribution Practices

Green distribution consists of green packaging and green logistics. Packaging characteristics such as size, shape and materials have an impact on the distribution. Better packaging along with rearranging loading patterns can reduce materials usage, increase space utilization both in the warehouse and trailer and reduce amount of handling required.

Some of the Green Distribution Practices are: Green design which is the use of Environmentally Conscious Design (ECD) and Life Cycle Assessment analysis (LCA) with the aim of developing and understanding how design decisions affect the product environmental compatibility (Glantsching, 1994; Chandra, 1991) and also waste minimization (Johnson, 1998; Sarkis & Cordeiro, 2001). Environmental labeling/ Eco-labeling is another practice of Green Distribution. It entails describing the information of a product about the environmental impact associated with the production or use of the product (Rotherman, 1999).

According to Gungor and Gupta (1999), Life Cycle Assessment is also another practice of Green distribution. It is the process of assessing and evaluating the environmental, occupational health and resource related consequences of a product through all phases of its life. It involves tracking all material and energy flows of a product from the retrieval of its raw materials out of the environment with the disposal of the product to the environment (Arena et al., 2003).

2.4.4 Reverse Logistics Practices

According to Xie and Breen (2012), reverse logistics is basically the process of planning, implementing and controlling the efficient, cost-effective flow of raw materials, in process inventory, finished goods and related information from the point of consumption to the point of origin for the purpose of recapturing or creating value or proper disposal. It 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. Reverse logistics involves forward and backward information flow that may enable the company to initiate green logistics and lean logistics, which would be of immense competitive advantage (Lyons & Farrington, 2006).

According to Smith (2005), reverse logistics aid a company to identify problem areas and patterns of defects, thereby reducing the number of returned items. Lambert (2008); Wisner and Stanley (2007) asserted that reverse logistics activities includes seasonal inventory, processing returned merchandise, restock, salvage recalls, screening defective merchandise. Other practices of reverse logistics are product returns, remanufacturing recovery, reuse and redistribution.

2.5 Green Supply Chain Management Practices and Firm Performance

According to Zhu et al. (2004), there are two ways of looking performance in relation to GSCM practices: environmental performance and Economic Performance. The environmental performance deals with reducing substances that pollute the environment while Economic Performance emphasizes more on the element of cost.

There are several studies that have attempted to link practices of GSCM with firm performance. While some studies such as Zhu and Sarkis (2004); Rao and Holt (2005); Green et al. (2005) found positive relationships, Giovanni and Vinzi (2012); Huang et al. (2012) showed there is no significant relationship between such practices and organizational performance. However, Azevedo et al.(2011); Wu and Pagell (2011) found a combination of positive and other relationships while Zhu and Sarkis (2007) recommended that economic performance remains the top priority for manufacturers.

Madsen and Ulhui (2003) argue that corporate adoption of environmental management is to harmonize an environmental strategy with other strategic issues such as corporate goals and product positioning. According to them, result of proactive pollution prevention programs could actually reduce production cost and improve product value or the image of the company. Monera and Oritas (2010) also discovered that environmental performance has a positive correlation with financial performance of the firm. Khanna and Anton (2002) believe that corporate environmental management is a self regulatory business approach not only to protect the environment, but also strategically integrate environmental considerations into corporate strategic decisions.

Beamon (1999) suggested that the structure of traditional performance being implemented in the entire supply chain must now include new techniques such as reverse logistics so as to embrace new performance measurement systems. GSCM may include both local and global aspects, therefore, this would allow interaction of customers and supplier staff, partnership agreements and joint research which would eventually lead to improvements in environmental performance. Geffen and Rothenberg (2000) recommended that this can be greatly achieved through adoption of environmental technologies.

Strategy researchers have recommended that companies need to adopt production performance and financial performance so as to improve the organizational performance (Im and Workman, 2004; Paladino, 2007). Production performance involves green product innovation which is defined as the performance of product innovation that is related to green concept. Such product innovations include eliminating pollution, conservation of energy, waste recycling and green product designs (Chen et al., 2006). Financial performance relates to the level of firms' profitability to that of its competitors (Clemens, 2006; Judge & Douglas, 1998). However, Wagner et al. (2001) argues that there has been contradiction in the relationship between firm's financial performance and environmental management because of corporate environmental practices which have contributed to both positive and negative economic performance.

According to Bititci et al. (2000) Balanced Score Card (BSC) and SCOR model are some of metrics that can be used to measure the performance of a firm. BSC developed by Kaplan and Norton (2001) consist of four perspective as a set of measures which include; (i) how do we look to our stakeholder (financial perspective) (ii) what must we excel at

(internal business perspective) (iii) how do our customers see us (the customer perspective) and (iv) how can we continue to improve and create value that is innovation learning perspective (Tangen, 2004). The SCOR model was developed by the Supply Chain Council to assist firms in increasing the effectiveness of their SCs, and to provide a process-based approach to SCM. The SCOR model provides a common process oriented language for communicating among supply-chain partners in the following decision areas: plan, source, make, and deliver. The four performance matrices as part of the SCOR model to measure process performance includes delivery reliability, flexibility, responsiveness, costs, and assets (Huan et al., 2004).

2.6 Challenges of Implementation of Green Supply Chain Management Practices

A number of challenges have been associated to the process of adopting GSCM and its practices and The Ryder Centre of Supply Chain Management (2008) identified three challenges: Lack of technology and business processes needed to capture data; Information Technology can make Supply Chain greener by optimizing the resources required to support business .It also enable more effective planning, execution and collaboration of supply chain thereby resulting to reduction in resource requirement (Cognizant, 2008). The green supply chain and supply chain are complement of one another and therefore Green Supply Chain technologies cannot work independent of the business process.

Trade off between green requirements and lean practices; green requirements share a common focus on waste reduction. Leanness emphasizes on the reduced amount of inventory going through supply chain hence minimizing environmental impact. However, according to Mollenkopf et al. (2010) asserts that lean strategies that employ Just In Time

(JIT) delivery of small batch sizes which improves efficiency, can require increased transportation, packaging and handling hence increasing emission and this contradicts green approach. Failure to integrate supply chain optimization efforts with green supply chain efforts is the third challenge. Most firms that implement green supply chain practices fail to integrate environmental considerations into the supply chain management process. They are often driven by the need to green an existing process or a piece of the chain. Although this has a positive impact on the environment, the environmental aspects are frequently not considered when reviewing the business overall supply chain performance and making changes to the supply chain (Cash & Wilkerson, 2003).

In addition, Wilkerson (2010) came up with five major challenges that companies face when adopting GSCM practices. These include: Standards; companies have to comply with certain number of standards when adopting the concept of GSCM and most of them find it hard to comply. Such standards include; ISO 140065, ISO Standards, Environmental Protection Agency Greenhouse Gas Reporting Rule etc and for a company which is newly implementing GSCM practices might find it challenging on what standard to go after.

The second challenge is awareness; creating awareness among the supply chain team members is a challenge. Although Green awareness has been improving, there is still a lot people need to know about GSCM. For instance, vendors will have to show evidence that they have measured their greenhouse gas emissions and have water optimization plans in place and this shows how awareness is changing. Business Case Development is another challenge identified. In the future, corporate social responsibility, competitive pressures as well as using limited capital will be a challenge to the multi-national supply chains.

Strategic planners will struggle to develop business cases since the best practices are shared.

Communication is the fourth challenge; environmental sustainability encompasses everything from renewable energy to various employee commute emissions and industry specific operational definitions. It therefore requires organizations to develop communication strategy in the early stages of green supply chain process. The other challenge being associated with implementation of green supply chain management practices is Sustainability Program Implementation. When organization does not know which standards are to be followed, implementation of green supply chain management becomes a challenge.

2.7 Summary of Literature review

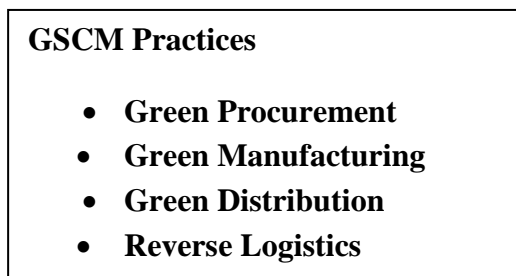
This study aims to establish the relationship between GSCM practices and performance of firms in the Automotive industry in Kenya. In summary, the concept of GSCM is evident however in Kenya, few researches have been done. The performance measurements in the aspect of GSCM have not been fully explored. The literature has discussed the major four practices of GSCM adopted by organizations though different organizations implement different practices, hence lack of universally acceptable practices. Moreover, there is lack of consensus on the impact of GSCM practices on firms' performance since, a given type of practice have a different impact, there are variety of performance measurements and implementation of different settings result in different performance. The literature has also reviewed the challenges of implementing GSCM practices, the relationship between GSCM practices and firm performance.

2.8 Conceptual Framework

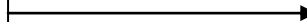
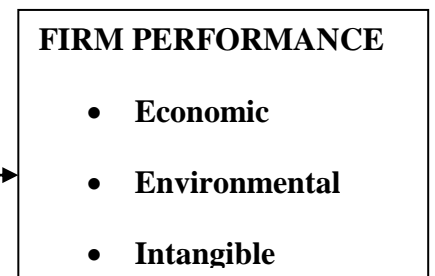
Figure 2.1: Conceptual Framework to link GSCM Practices and Firm Performance

In the study, the dependent variable is the firm performance while GSCM practices are the independent variable. GSCM practices are expected to have impact on performance of the firms in the automotive industry in Kenya.

INDEPENDENT VARIABLES



DEPENDENT VARIABLE



Source: Researcher (2014)

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter gives the methodology that was used to obtain answers to the research questions in chapter one. This section include: research design, target population, data collection and data analysis.

3.2 Research Design

The study used descriptive research design. It allowed the researcher to gather information about prevailing conditions for the purpose of description and interpretation (Salaria, 2012). Descriptive research design assisted to explain the relationship between the GSCM practices and performance of firms in the automotive in Kenya.

3.3 Population of the Study

The study targeted all dealers and assemblers in the automotive industry in Kenya. According to Price Water Coopers (2012), there are five major motor vehicle dealers and four assembly plants in Kenya, who formed the population of this study. There was no need of sampling because the population is small. A census of all the dealers and assemblers in the automotive industry was conducted.

3.4 Data Collection

The researcher involved four respondents from each manufacturer, namely: Procurement and or Supply Chain Manager, Operations Manager, Marketing Manager and Logistics Manager. The respondents were chosen because they have complete information about the operations and practices of the firm. Structured questionnaire was used as the main

tool for collecting data and was guided by the objectives of the study, data to be collected and time available. The questionnaire was in form of likert scale where respondents were required to indicate their views on a scale of 1 to 5. This tool was chosen by the researcher because allowed the respondents to express their views more clearly and openly. The questionnaire was administered through a drop and pick method and it consisted of four sections: Section A included general information, section B: practices of GSCM, section C: relationship between GSCM practices and firm's performance and section D: challenges of adopting GSCM practices.

3.5 Data Analysis

In this study, Statistical Package for Social Sciences (SPSS) was used to capture data and analyze it. Objective 1 was to establish the extent to which GSCM Practices was used by firms in the automotive industry in Kenya and challenges faced. The data for this objective was analyzed through use of description statistics such as mean and standard deviation. Objective 2 was to establish the relationship between GSCM Practices and performance of firms in automotive industry in Kenya. The data was analyzed through use of multiple regression equation given as $P = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + e$ where; P= Firm performance, a= is the P intercept, e= error term, b_1, b_2, b_3, b_4 , = regression weights for each variable, x_1 = Green Procurement Practices, x_2 = Green manufacturing Practices, x_3 = Green distribution Practices and x_4 = Reverse Logistics Practices.

For understanding and interpretation of findings, tables were used to show the relationship between GSCM practices and Performance of the firms in the Automotive industry in Nairobi, Kenya.

CHAPTER FOUR: DATA ANALYSIS, PRESENTATION AND DISCUSSION

4.1 Introduction

This study was carried out to establish the Relationship between Green Supply Chain Management practices and performance of the firms in Automotive industry in Nairobi, Kenya. Data was collected from the managers of the departments or equivalent who were in charge of firms in the automotive industry

4.2 Response Rate

A total of 36 questionnaires were distributed to firms in the automotive industry in Nairobi, Kenya. Out of the 36 questionnaires, only 28 questionnaires were returned to the researcher. This represents a response rate of 78% and hence was considered sufficient for this study. The 22% who never returned the questionnaires cited that they were too busy.

Table 4.1 Designation in the company

The researcher sought to establish the positions the respondents held in the company. The results are presented on the table 4.1.

Designation of the respondent	Frequency	Percent
Procurement / Supply Chain Manager	7	25
Operations Manager	5	17.9
Marketing Manager	3	10.7
Logistics Manager	6	21.4
Others	7	25
Total	28	100

Source; Research Data (2014)

According to the Table 4.1, 25% of the respondents were procurement managers, 17.9% of the respondents were operations managers, 10.7% of the respondents were marketing managers, and 21.4% respondents were logistics managers while 25% of the respondents represented the respondents whom titles were not equivalent to the designations in the questionnaire. The results indicated that most of the questionnaires were filled by respondents who are well versed with the activities and therefore an assurance that required information was obtained.

Table 4.2 Duration of Employment

The respondents were asked to indicate the number of years they have worked in the company and were provided with options to choose from. The results are presented on the table 4.2.

Duration of Employment	Frequency	Percent
Less than 2 years	7	25
2-5 years	18	64.3
6-10 years	2	7.1
10-15 years	1	3.6
More than 15 years	0	0
Total	28	100

Source; Research Data (2014)

From Table 4.2 above, 64.3% of the respondents have worked between 2-5 years; this indicates that the respondents are familiar with the operations of the firm. 25% of the respondents have worked for less than two years, 7.1 % of the respondents have worked for their companies between 6-10 years while 3.6% of the respondents have worked between 10-15 years. None of the respondents had worked for more than 15 years.

4.3 Role of Green Supply Chain Management Practices

The respondents were asked to indicate whether their firms appreciate the Role of Green Supply Chain Management Practices. They were provided with two options to choose from. The respondent agreed that their firms appreciate role of Green Supply Chain Management Practices. This indicates that firms use green supply chain management practices in their operations.

4.3 Green Supply Chain Management Practices

Different researchers have defined GSCM from different perspectives. Sarkes (1999) refers to the GSCM as a structure which includes Green Procurement, Green Manufacturing, Green Distribution and Reverse Logistics. In this study, GSCM include

Green Procurement practices, Green Manufacturing practices, Green Distribution practices and Reverse Logistics practices. The study sought to know the extent to which Green Supply Chain Management Practices is used by the firms in the automotive industry.

Table 4.3 Extent the firm practice Green Procurement

The study sought to establish the extent to which green procurement practices was used by firms in the automotive industry using a five point likert scale, where; 1= very large extent, 2= large extent, 3= moderate, 4= small extent and 5= not at all. The results are presented on the table below.

Green Procurement practices	Mean	Std. Dev
Ensure suppliers meet their environmental objectives	2.07	0.02
Require suppliers to have ISO 14001	1.96	0.04
Purchasing materials that contain green attributes	2.04	0.03
Purchasing energy saving equipment	2.18	0.00
Evaluate Suppliers on specific environmental criteria	2.25	0.01
Use paperless methods to order materials	2.61	0.08
Procure products that are made using recycled packages	2.21	0.00
Total	15.32	0.19
Average	2.19	0.03

Source; Research Data (2014)

From the results in Table 4.3, the most used Green procurement practices by firms in the automotive industry include: ensure suppliers meet their environmental objectives ($M=2.07$, $SD=.02$); require suppliers to have ISO 14001 ($M=1.96$, $SD=.04$); purchasing

materials that contain green attributes ($M=2.04$, $SD=.03$); purchasing energy saving equipment ($M=2.18$, $SD=.00$); evaluate suppliers on specific environmental criteria ($M=2.25$, $SD=.01$); procure products that are made using recycled packages ($M=2.21$, $SD=.00$). It is evident that the firms in the automotive industry have largely used the green procurement practices however use of paperless methods to order materials is moderately used ($M=2.61$, $SD=0.08$). The average mean score was 2.19 which imply that firms in the automotive industry have adopted green procurement practices.

The results indicated that green procurement is practiced by automotive industries to a large extent. In relation to study conducted by Lee (2008), a buying organization with a green supply chain initiative will pay attention to green practices of their suppliers. The adoption of green procurement is one of the commonly accepted dimensions of Green Supply Chain Management practices.

Table 4.4 Extent the firm practice Green Manufacturing

The study sought to establish the extent to which green manufacturing practices was used by firms using a five point likert scale, where; 1= very large extent, 2= large extent, 3= moderate, 4= small extent and 5= not at all. The results are presented on the table 4.4 below.

Green manufacturing practices	Mean	Std. Dev
Produce products that have packages which can be recycled	2.25	0.00
Control power consumption in the products	2.04	0.04
Use Life Cycle Assessment to evaluate environmental load	1.89	0.06

Replacing hazardous substances with that are environmentally friendly	2.54	0.06
Ensure products have recyclable contents	2.29	0.01
Minimize the use of materials in packaging	2.39	0.03
Encourage reuse of products and recycled materials	2.18	0.01
Total	15.57	0.22
Average	2.22	0.03

Source; Research Data (2014)

According to the table 4.4 above, replacing hazardous substances with that are environmentally friendly ($M=2.54, SD=.06$); minimize the use of materials in packaging ($M=2.39, SD=.03$); ensure products have a recyclable contents ($M=2.29, SD=.01$); produce products that have packages which can be recycled ($M= 2.25, SD=.00$); encourage reuse of products and recycled materials ($M=2.18, SD=.01$); control power consumption in the products ($M=2.04, SD=.04$); use of life cycle assessment to evaluate environmental load ($M=1.89, SD=.06$). The average mean score is 2.22 and implied that most firms in the automotive industry have implemented green manufacturing practices.

The results above indicate that the firms in the automotive industry practice green manufacturing practices to a large extent. Therefore, firms have integrated their product with issues of manufacturing, planning and control in such manner to identify, quantify, access and manage the flow of environmental waste. It was observed that the industry have a goal of reducing and ultimately minimizing environmental impact while also trying to maximize resources efficiency (Melnik et al., 2009).

Table 4.5 Extent the firm practice Green Distribution

The study sought to establish the extent to which green distribution practices was used by firms, where; 1= very large extent, 2= large extent, 3= moderate, 4= small extent and 5= not at all. The results are presented on the table 4.5.

Green distribution practices	Mean	Std. Dev
Promoting recycling and reuse programs among the employees	2.29	0.03
Use of alternative fuels	2.89	0.08
Reducing the size of packaging	2.61	0.03
Cooperating with suppliers to standardize packaging	2.07	0.08
Total	9.86	0.22
Average	2.46	0.06

Source; Research Data (2014)

According to the table 4.5 above, the most used green distribution practices were: promoting recycling and reuse programs among employees ($M=2.29$, $SD=.03$); cooperating with suppliers to standardize packaging ($M=2.07$, $SD=.08$). The result shows that the firms in the automotive least implement these practices: use of alternative fuels ($M= 2.89$, $SD=.08$); reducing the size of packaging ($M=2.60$, $SD=.03$). The average mean score is 2.46 which indicate that firms practice green distribution.

The firms in the automotive industry practice green distribution to a large extent. According to Arena et al. (2003) tracking all materials and energy flows of a product from the retrieval of its raw materials out of the environment with the disposal of the product to the environment should be done.

Table 4.6 Extent the firm practice Reverse Logistics

The study sought to establish the extent to which reverse logistics practices was used by firms, where; 1= very large extent, 2= large extent, 3= moderate, 4= small extent and 5= not at all. The results are presented on the table 4.6.

Reverse Logistics	Mean	Std. Dev
Seasonal inventory	2.00	0.00
Processing returned merchandise	1.79	0.04
Restocking	1.86	0.03
Recalling salvage	2.21	0.04
Screening defective merchandise	2.04	0.01
Redistribution	2.14	0.03
Total	12.04	0.14
Average	2.01	0.02

Source; Research Data (2014)

Table 4.7 above shows the extent to which reverse logistics has been used by firms in the automotive industry: recalling salvage ($M=2.21$, $SD=.04$); redistribution ($M=2.14$, $SD=.03$); screening defective merchandise ($M=2.04$, $SD=.01$); seasonal inventory ($M=2.00$, $SD=.00$); restocking ($M=1.86$, $SD=.03$); processing returned merchandise ($M=1.79$, $SD=.04$). The average mean score is 2.01 and this implies that the firms in the automotive industry practice reverse logistics to a large extent.

The findings imply that reverse logistics such as seasonal inventory, processing returned merchandise, restock, salvage recalls and screening defective merchandise has been largely practiced as asserted by Winsor and Stanley (2007). As Xie and Breen (2012)

state that 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.

4.4 Firm Performance

The study measured the firm performance in terms of economic performance, environmental performance and intangible performance.

Table 4.7 Economic Performance with regards to implementation of GSCM Practices

The study sought to establish the extent to which green supply chain management practices had an impact on Economic Performance of the firm, where; 1= very large extent, 2= large extent, 3= moderate, 4= small extent and 5= not at all. The results are presented on the table 4.7.

Economic Performance	Mean	Std. Dev
Increase profits	1.93	0.00
Increase market share	1.96	0.01
Increase in price of dividends	1.82	0.02
Lower raw material cost	1.89	0.01
Production efficiency gained	2.14	0.04
Reduce environmental expenses	1.86	0.01
Total	11.61	0.09
Average	1.93	0.02

Source; Research Data (2014)

Table 4.7 above shows: production efficiency gained ($M=2.14$, $SD=.04$); increase in market share ($M=1.96$, $SD=.01$); increase in profits ($M=1.93$, $SD=.00$); lower material cost ($M=1.89$, $SD=.01$); reduce environmental expenses ($M=1.86$, $SD=.01$); increase in price dividends ($M=1.82$, $SD=.02$). The average means score is 1.93, which means that usage of green supply chain management practices have had a positive impact on the economic performance of the automotive industry in Kenya.

The findings are in agreement with Ninlawan et al. (2010) who argued that the green practices can lead to lower costs, reduced environmental and occupational safety expenses and production efficiency gains. Rao and Holt (2005) demonstrated a link between green supply chain management practices. They found out that GSCM practices led to competitiveness and better economic performance. This also corresponds to the findings presented.

Table 4.8 Environmental Performance with regards to implementation of GSCM Practices

The study sought to establish the extent to which green supply chain management practices had an impact on environmental performance of the firm where; 1= very large extent, 2= large extent, 3= moderate, 4= small extent and 5= not at all. The results are presented on the table 4.8 below.

Environmental performance	Mean	Std. Dev
Improve the reuse, recycling and remanufacturing opportunities	1.96	0.04
Decrease of consumption for hazardous and toxic materials	1.79	0.01
Improve environmental situation of the company	1.61	0.03

Decrease the frequency for environmental accidents	1.68	0.02
Reduce environmental burdens	1.75	0.00
Total	8.79	0.09
Average	1.76	0.02

Source; Research Data (2014)

The table 4.8 shows that the respondents agreed that GSCM practices have a relationship with environmental performance of the firm: improve reuse, recycling and remanufacturing opportunities ($M=1.96, SD=.04$); decrease of consumption for hazardous and toxic materials ($M=1.79, SD=.01$); reduce environmental burdens ($M=1.75, SD=.00$); decrease the frequency for environmental accidents ($M=1.68, SD=.02$); improve environmental situation of the company ($M=1.61, SD=.03$). The average mean score is 1.76 and this indicates that usage of GSCM practices have resulted to the improved environmental performance.

These findings correspond with Zhu and Sarkis (2004) who found a positive relationship between adoption of green supply chain management practices and improvements in environmental and economic performance. In the manufacturing setting such as automotive industry, strong relationships with the suppliers results in improved environmental performance (Geffen & Rothenberg, 2000).

Table 4.9 Intangible Performance with regards to implementation of GSCM Practices

The study sought to establish the extent to which green supply chain management practices had an impact on intangible performance of the firm where; 1= very large extent, 2= large extent, 3= moderate, 4= small extent and 5= not at all. The results are presented on the table 4.9.

Intangible performance	Mean	Std. Dev
Improve public image of the company	1.64	0.01
Improve customer loyalty	1.79	0.01
Total	3.43	0.03
Average	1.71	0.01

Source: Research Data (2014)

From the table 4.9: improve in public image of the company ($M=1.64$, $SD=.01$); improve customer loyalty ($M=1.79$, $SD=.01$). It is observed that the standard deviation for the two parameters are equal, however the usage of GSCM Practices has led to improved customer loyalty compared to improved public image of the company. The average mean score is 1.71 which implies that the firms have had their intangible performance improved by using GSCM practices.

Eltayeb et al. (2011) argued that intangible outcomes such as company image, product image, employee satisfaction and customer loyalty or satisfaction had not received much attention as outcomes of GSCM practices. However the findings in the study come into agreement with studies conducted by Testa and Iraldo (2010) and Xie and Breen (2012) asserting that GSCM practices can result in improved brand image and customer loyalty.

4.4 Relationship between Green Supply Chain Management Practices and Firm Performance

The study also sought to establish the relationship between Green Supply Chain Management Practices and Performance of firms in the Automotive industry in Nairobi, Kenya. The researcher conducted a regression analysis to explain the relationship. The study adopted the following linear equation to depict the relationship between the

variables; $P = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + e$. Where; P =Firm performance, a =P intercept, b_1 , b_2 , b_3 , b_4 are regression coefficient for the respective variables, x_1 =Green Procurement practices, x_2 =Green Manufacturing practices, x_3 =Green Distribution practices, x_4 =Reverse Logistics practices and e is the error term.

The four variables were measures using the responses on each of the variables obtained from the respondents. The results are presented in the table below.

Table 4.10 T test for Coefficients

		Coefficients ^a				
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	2.867	.100		28.811	.001
	Green procurement	-.918	.065	-1.851	-14.127	.005
	Green manufacturing	.383	.041	.787	9.285	.011
	Green distribution	.057	.004	1.925	15.479	.004
	Reverse logistics	-.025	.003	-.626	-7.818	.016

a. Dependent Variable: Firm performance

According to table 4.10, the regression equation is given as;

$P = 2.867 + 0.918X_1 + 0.383X_2 + 0.057X_3 + 0.025X_4$. The model illustrates that when all variables are held at constant, the value of the firm performance would be 2.867. Holding other factors constant, a unit increase in Green procurement practices would lead to 0.918 increase in firm performance, a unit increase in green manufacturing practices would lead to 0.383 increase in firm performance, a unit increase in green distribution practices would lead to 0.57 increase in firm performance and a unit increase in reverse logistics

would lead to 0.025 increase in firm performance. The value of p is 0.001 at the 95% significance level

Table 4.11 Coefficient of determination, R²

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.996 ^a	.992	.977	.0159820

a. Predictors: (Constant), Reverse logistics, Green manufacturing, Green distribution, Green procurement

The R² value indicates that the four independent variables explain 99.2% of the variance in performance of firms in the automotive industry in Nairobi, Kenya. It is clear that green supply chain management practices contribute to the improved performance of firms in automotive industry. It can be concluded that green practices are essential in firm performance given that the unexplained variance is only 0.8%.

Table 4.12 F test for the full model- Anova table

ANOVA^b						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.065	4	.016	63.732	.01 ^a
	Residual	.001	2	.000		
	Total	.066	6			

a. Predictors: (Constant), Reverse logistics, Green manufacturing, Green distribution, Green procurement

b. Dependent Variable: Firm performance

The study used ANOVA to establish the significance of the regression model from which an F significance value of p<0.01. This indicates that regression model has a less than

0.01 probability of giving wrong prediction. It can be concluded that regression model is statistically significant, hence suitable for explaining how green supply management practices affects performance of firms.

4.5 Challenges of using GSCM Practices

Table 4.13 Challenges faced in practicing Green Supply Chain Management Practices

The study aimed at finding out the challenges faced by firms in automotive industry in Kenya when practicing green supply chain management practices. Where; 1= very large extent, 2= large extent, 3= moderate, 4= small extent and 5= not at all. The results are presented on the table 4.13.

Challenges	Mean	Std. Dev
Lack of appropriate technology needed to implement GSCM practices	2.18	0.06
Lack of awareness among the employees, retailers and suppliers	2.00	0.02
Lack of tools and techniques for measuring GSCM performance	1.68	0.04
Suppliers or vendors are reluctant to adopt GSCM practices	1.71	0.03
Difficulties in complying with the organizational standards	1.89	0.00
Lack of commitment from the top management	1.82	0.01
Poor planning of implementation of the sustainability program	2.04	0.03
Lack of effective communication among the supply chain team	1.86	0.00
Failure to integrate supply chain optimization efforts with green supply chain efforts	1.79	0.02
Strict government rules and regulations	1.75	0.02
Trade off between green requirements and lean practices	1.93	0.01

Total	20.64	0.25
Average	1.88	0.02

Source; Researcher (2014)

The most seriously faced challenges were: lack of appropriate technology needed to implement green supply chain management practices ($M=2.18, SD=.06$); poor planning of implementation of the sustainability program ($M=2.04, SD=.03$); lack of awareness among the employees, retailers and suppliers ($M=2.00, SD=.02$); tradeoff between green requirements and lean practices ($M=1.93, SD=.01$); difficulties in complying with the organizational standards ($M=1.89, SD=.00$); lack of effective communication among the supply chain team ($M=1.86, SD=.00$); lack of commitment from the top management ($M=1.82, SD=.01$).

The areas that showed the least sources of challenges when implementing GSCM practices include: failure to integrate supply chain optimization efforts with green supply chain efforts ($M=1.79, SD=.02$); strict government rules and regulations ($M=1.75, SD=.02$); suppliers are reluctant to adopt green supply chain management practices ($M=1.71, SD=.03$); lack of tools and techniques for measuring green supply chain management performance ($M=1.68, SD=.04$). The average mean score is 1.88 and this means that the firms in the automotive industry face challenges to a large extent when implementing GSCM practices.

These findings seem to conform the posit by The Ryder Centre of Supply Chain Management (2008) which found out that major challenges faced when implementing GSCM Practices include: lack of appropriate technology, trade- off between green requirements and lean practices and failure to integrate supply chain optimization efforts

with green supply chain efforts. Moreover, the findings correspond to the challenges identified by Wilkerson (2010).

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The study was carried out to establish the relationship between Green Supply Chain Management Practices and Performance of firms in automotive industry in Nairobi, Kenya. The study had two objectives; To establish the extent of Green Supply Chain Management Practices used by firms in automotive industry in Kenya and challenges faced; To establish the relationship between Green Supply Chain Management Practices and performance of firms in automotive industry in Nairobi, Kenya. This chapter presents the summary of findings for the objectives mentioned above, conclusion, limitations, recommendations made based on the findings and suggestions on the areas that need to be researched further in the study.

5.2 Summary of Findings

The study established that all the firms in the automotive industry appreciate the role of Green Supply Chain Management Practices. The firms practice green procurement where the most practices were ensuring suppliers meet their environmental objectives, purchasing materials that contain green attributes, purchasing energy saving equipment and evaluating suppliers on specific environmental criteria. It was found out that using paperless methods to order materials were least used. On practicing Green manufacturing, majority of the respondents replace hazardous substances with that are environmentally. In addition other green manufacturing practices that had adopted by the

firms to a large extent were controlling power consumption in products, use of life cycle assessment.

It was found out that on average, the automotive industry practice green distribution. However, the most used practices were promoting recycling and reuse programs among the employees and cooperating with suppliers to standardize packaging. The least practices adopted by the firms was use of alternative fuels and reducing the size of packaging. On practicing reverse logistics, it was found out that firms in the automotive industry practice reverse logistics to a large extent, whereby recalling the salvage is extensively practiced.

Majority of respondents acknowledged that there were challenges faced when adopting Green Supply Chain Management Practices, with lack of appropriate technology being a major challenge. Most of the firms lack tools and techniques to measure Green Supply Chain Management performance. This corresponds to the challenges identified by Ryder Centre of Supply Chain Management (2008)

From the study, it is evident that the four independent variables of Green Supply Chain Management Practices improved firm performance as explained by 99.2% of the variance; production efficiency has been gained in relation to Economic Performance. Majority of the respondents agreed that the usage of Green Supply Chain Management Practices have improved reuse, recycle and remanufacturing opportunities and also improved customer loyalty.

5.3 Conclusions

The study concludes that the firms in automotive industry in Nairobi, Kenya are considering the usage of Green Supply Chain Management Practices and there are challenges associated with the adoption of the practices. This implies that the first objective of the study has been achieved. From results, regression analysis showed that there is a strong relationship between Green Supply Chain Management Practices and performance of firms in the automotive industry in Kenya. Hence, the second objective of the study has been accomplished. It can be generally concluded that Green Supply Chain Management practices will assist firms in the automotive industry to improve the performance in terms of economic, environmental and intangible performance.

5.4 Recommendations

According to the study, GSCM Practices play a critical role in Firm performance. The study recommends that firms should emphasize on suppliers to have ISO 14001, use life cycle assessment to evaluate environmental load, cooperate with suppliers to standardize packaging and process returned merchandise to improve their performance.

5.5 Limitations and Suggestions for Further Research

There are limitations to this study when interpreting the study results. The study focused on firms in the automotive industry in Nairobi because these findings are specific to the major motor vehicle dealers and assembly plants as per Price Waters Coopers report (2012). Therefore the findings may not be applicable to other industries in and outside Kenya. Secondly, different firms adopt different green practices hence lack of universally

acceptable practices and a given type of practice have a different impact and implementation of different settings result in different performance.

The data collection was collected by likert scale questionnaires which might have biases of the respondents reflected in the results. There is therefore a possibility that if respondents were different, the results might be different. Moreover, data collection was another challenge because some firms were not ready to participate, citing lack of time.

The study shows there is growing importance among the companies hence need to conduct further research on how GSCM practices affect performance of firms in the services industry as well as other types of organizations such as wholesalers and retailers. In addition, the study suggests on further research on the tools and techniques required to measure the performance of firms who have adopted GSCM practices.

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APPENDICES

APPENDIX 1: RESEARCH QUESTIONNAIRE

This questionnaire has been designed for the purposes of collecting data on the Green Supply Chain Management Practices and Performance of the firms in the Automotive Industry in Kenya. The information will be treated as confidential and used for academic purposes only. Kindly answer the questions as appropriate.

SECTION A: GENERAL INFORMATION

1. What is your designation in the company?

Procurement / Supply Chain Manager

Operations Manager

Marketing Manager

Logistics Manager

Others.....

2. How long have you worked in the company?(Tick in the box)

Less than 2 years

2-5 years

6-10 years

10-15 years

More than 15 years

3. As an organization, do you appreciate the role of Green Supply Chain Management practices? (Yes/No)

.....

SECTION B: PRACTICES OF GREEN SUPPLY CHAIN MANAGEMENT

4. Below is a list of practices of Green Supply Chain Management. Please tick appropriately the extent to which each of them is practiced in your company.

(1) Very Large Extent (2) Large Extent (3) Moderate (4) Small Extent (5) Not at all

Green procurement practices	1	2	3	4	5
Ensure suppliers meet their environmental objectives					
Require suppliers to have ISO 14001					
Purchasing materials that contain green attributes					
Purchasing energy saving equipment					
Evaluate suppliers on specific environmental criteria					
Use paperless methods to order materials					
Procure products that are made using recycled packages					
Green manufacturing practices					
Produce products that have packages which can be recycled					
Control power consumption in the products					
Use Life Cycle Assessment to evaluate environmental load					
Replacing hazardous substances with that are environmentally friendly					
Ensure products have recyclable contents					
Minimize the use of materials in packaging					

Encourage reuse of products and recycled materials					
Green distribution practices					
Promoting recycling and reuse programs among the employees					
Use of alternative fuels					
Reducing the size of packaging					
Cooperating with suppliers to standardize packaging					
Reverse Logistics					
Seasonal inventory					
Processing returned merchandise					
Restocking					
Recalling salvage					
Screening defective merchandise					
Redistribution					

Others (please specify).....
.....
.....

SECTION C: RELATIONSHIP BETWEEN GREEN SUPPLY CHAIN MANAGEMENT PRACTICES AND FIRM PERFORMANCE

5. Please tick appropriately how you rate performance of your firm with regards to the parameters listed.

(1)Very large extent (2) Large extent (3) Moderate extent (4) Small extent (5) Not at all

Impact	1	2	3	4	5
Increase profits					

Increase market share					
Increase in price of dividends					
Lower raw material cost					
Production efficiency gained					
Reduce environmental expenses					
Improve the reuse, recycling and remanufacturing opportunities					
Decrease of consumption for hazardous and toxic materials					
Improve environmental situation of the company					
Decrease the frequency for environmental accidents					
Reduce environmental burdens					
Improve public image of the company					
Improve customer loyalty					

Others (please specify).....
.....
.....

SECTION D: CHALLENGES OF GREEN SUPPLY CHAIN MANAGEMENT

6. Identify the extent to which the following challenges faced when adopting Green Supply Chain Management practices.

- (1) Very large extent (2) Large extent (3) Moderate extent (4) Small extent
(5) Not at all

CHALLENGES	1	2	3	4	5
Lack of appropriate technology needed to					

implement GSCM practices					
Lack of awareness among the employees, retailers and suppliers					
Lack of tools and techniques for measuring GSCM performance					
Suppliers or vendors are reluctant to adopt GSCM practices					
Difficulties in complying with the organizational standards					
Lack of commitment from the top management					
Poor planning of implementation of the sustainability program					
Lack of effective communication among the supply chain team					
Failure to integrate supply chain optimization efforts with green supply chain efforts					
Strict government rules and regulations					
Trade off between green requirements and lean practices					

Others (please specify).....
.....
.....

THANKS FOR YOUR COOPERATION!