

**GREEN SUPPLY CHAIN MANAGEMENT PRACTICES AND  
COMPETITIVENESS OF LOGISTICS FIRMS IN MOMBASA  
COUNTY**

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## DECLARATION

This research project is my original work and has not been presented for a degree award in any other University.

Signed.....

Date.....

Marvin Tana

D61/80427/2012

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

Signed ..... Date.....

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## **DEDICATION**

This research project is lovingly dedicated to my parents Mr. Christopher Muli and Prof. Faith Muli who have been a constant source of inspiration and shown me unconditional love and support throughout my life. They have given me the drive and discipline to tackle any task with enthusiasm and determination. Special Thanks to my friends and colleagues for the wavering support in my journey to further my studies.

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## **ABSTRACT**

Green supply chain management has emerged as a key approach for logistics firms seeking to become environmentally sustainable and globally competitive. As a developing country, Kenya has to balance both operational and environmental performance. The objective of this study was to determine the relationship between competitiveness and adoption of green supply chain management practices by logistics firms in Mombasa County, Kenya. A descriptive research design was adopted for this study. It targeted a population of logistics firms operating in Mombasa County listed by Kenya National Highways Authority (KeNHA). A sample of 50 firms was taken. The data was collected using questionnaires. The results obtained indicated that green supply chain management practices were at implementation stage and that most logistics firms were considering adoption. The study also established that the major perceived benefits of adopting green supply chain management are; reduction of environmental degradation, reduction of operational costs and increased customer base. Lastly, the major factors influencing adoption of green supply chain management were found to be; organization resources, desire for economic benefit, government regulations and customer awareness. The study recommends that the management in logistics firms should focus and allocate more resources towards pollution prevention practices as these results in greater savings and thus higher firm performance. They should also strive at achieving green supply chain management practices as this will enhance efficiency in the logistics industry, environment performance and reduce waste to achieve cost savings. Finally, the logistics firms should act fast and implement green supply chain management practices since there are potential benefits which will result in sales growth.

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## **ACRONYMS AND ABBREVIATIONS**

EPA- Environmental Protection Agency

GSCM- Green Supply Chain Management

GHG- Green House Gas

ISO - International Standardization Organization

KEBS - Kenya Bureau of Standards NEMA

KeNHA - Kenya National Highways Authority

MCC - Mombasa County Council

NEMA - National Environmental Management Authority

OECD- Organization for Economic Co-operation and Development

RDT- Resource Dependency Theory

SCM - Supply Chain Management

SME- Small Medium Enterprises

# CHAPTER ONE: INTRODUCTION

## 1.1 Background of the Study

Green supply chain management (GSCM) is a specialized and widely diffused practice among firms that are seeking to improve their environmental performance. The motivation for the adoption of GSCM policies is usually ethical through reflecting organizations values and commercial through gaining competitiveness by signaling environmental concern (Testa & Iraldo, 2010). The idea of adopting GSCM policies is to eliminate energy, chemical and solid waste along the supply chain, (Ninlawan, Seksan , Tossapol, & Pilada, 2010). GSCM focuses on integrating environmental thinking into the supply chain management of an organization. This includes all the activities that are involved from the product design up to the final delivery of the product while also focusing on the end of life management of the product after its useful use (Kazemzadeh, 1998).

The concept of GSCM is based on the concept of JIT and SCM based in the early 2000, which focused on improving the efficiency and minimizing waste (Zhu, Sarkis, & Lai, 2011). According to (Zhu et al. 2011), there are various theories that explain the emergence of GSCM and how it came to become a contributing factor in organizational performance. The theories include: Institutional theory which asserts than an institutional environment greatly influences the development of its formal structure, resource based view which states that the application of intangible assets of a firm will directly affect its competitiveness, resource dependence theory which explains how external resources affect a firms performance and transaction cost economics which explains the effect of

costs incurred in making economic exchanges (Mwailu & Mercer, 1983). GSCM is an important new innovation that has enabled organizations to develop strategies that achieve profit and market share objectives by lowering their environmental risks and impacts while increasing their ecological efficiency (Ninlawan et al. 2010).

### **1.1.1. Green Supply Chain Management**

Green supply chain management is a sustainable strategic development for enterprises in today's competitive markets that has emerged as a new innovative approach of achieving both financial and environmental benefits simultaneously by reducing environmental risk and impact (Hoek, 1999). According to Zhu (2005), green supply chain management is a modern management tool that comprehensively considers the environmental influence and resource utilization efficiency in an organizations supply chain and how to implement GSCM in the organizations operations. The supply chain of a manufacturing organization has a deep and extraordinarily varied environmental impact. These impacts arise not only from raw materials and component purchases, supplier manufacturing processes or logistics arrangements, but can also include final product disposal and even the positioning of supplier plants (Lutz, 2005).

Green supply chain practices are the activities an organization undertakes that enables it to integrate its environmental management activities with other organizations in the supply chain or externalizing environmental management in the supply chain by employing market-based mechanisms. These practices require organizations to work and collaborate with suppliers and customers to enhance environmental stability (Martusa, 2013).

GSCM has emerged as an important new approach for enterprises to achieve profit and market share objectives by reducing environmental risk and impact. With the increased environmental concerns during the past decade, awareness is growing 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, Yen & Chae, 2005).

### **1.1.2 Competitiveness**

Competitiveness is the ability for an organization to offer products and services that meet the quality standards of the local and international markets at prices that provide adequate returns on the resources employed or consumed in producing them. Competitiveness also pertains to the ability and performance of an organization to be able to sell and supply goods and services in a given market (Robertz, 2002).

Competitiveness is synonymous with an organizations long-run profit performance and its ability to compensate its employees and provide superior returns to its owners. Indicators of competitiveness in an organization include customer values, shareholder values and the ability to react within a competitive environment (Barney, 1992).

### **1.1.3 Green Supply Chain Management and Competitiveness**

GSCM as a strategy to gain competitiveness means the orienting empirical study shows that there is a substantial interest amongst organizations to take action to decrease their environmental impact. The goal of adding value to the business and reducing costs in all parts of the production system is identified as key drivers in order to increase competitiveness (Azzone, 1994). The firms agree that the common manufacturing

objectives such as cost, quality, delivery and flexibility will not be enough in order to stay competitive when external stakeholders require an increased focus on sustainability. This means that organizations will start focusing on GSCM not as a burden or expense but rather as an important structure of the organization that achieves competitiveness (Martusa, 2013). Implementation of GSCM translates to improved environmental performance as measured by reductions in air emissions, effluent waste, solid waste, and the consumption of toxic materials. This usually translates to environmentally sustainable efforts that ultimately lead to an organization having competitiveness over other organizations that have not yet implemented GSCM practices (Esty & Porter, 1998).

Research carried out in Turkey on logistics firms described that logistics firms need to respond to environmental regulation and laws. The need for environmental performance is being heavily adopted in the purchasing agreements of multinational corporations for the suppliers both locally and internationally (Zhu & Sarkis, 2004). According to Garcia (2013), studies conducted for logistics firm in Mexico indicated that the main aim for logistics firms implementing GSCM is to meet international expectations and to improve environmental and financial performance. GSCM practices also create lower environmental liabilities that make an organization at a better credit risk level and less vulnerable to lawsuits. This enables an organization to achieve competitiveness on the level of organizational capital and accessing credit. GSCM practices also create better business portfolios through savings from better management of wastes (Shrivastava, 2007).

In Kenya, the adoption of GSCM practices is not being adopted by firms fully (Malaba, Ogolla & Mburu, 2014). The reason is that GSCM adoption is costly and many organizations look at cutting costs even if it means involving themselves in illegal activities. Adopting GSCM practices has various ways in which it contributes to organization competitiveness. It leads to sustainability and effective utilization of all of the available resources leading to major cost savings. It also contributes to competitiveness by increasing efficiency through reducing waste and production of hazardous substances, thereby preventing organizations from being fined as a result of violating environmental regulations. Consequently, the relevant operational costs are reduced whilst the efficiency of using resources is improved.

GSCM practices also assist in product differentiation by enabling an organization to position itself and its products as environmentally friendly in the customers' perception hence getting customer loyalty, reputation and strengthening the brand image in the market place. GSCM practices also lead to organizations producing products which are technologically advanced and environment friendly. The dissemination of technology assists in cutting production costs by adopting procedures that produces minimal cost and utilizes minimal labor. GSCM practices contribute to transparency of the supply chain leading to better control of product safety and quality thereby reducing risks and insurance costs leading to increased competitiveness.

#### **1.1.4 Logistics Firms in Mombasa**

Logistics describes the management of the flow of goods between the point of origin and the point of consumption in order to meet some requirements, of customers or corporations, (Gordan, 2010). The resources managed in logistics can include physical items, such as food, materials, animals, equipment and liquids, as well as abstract items, such as time, information, particles, and energy. In Mombasa, there are various ways of moving cargo from one place to another; this includes air, rail and road. Road transport constitutes 95% of all cargo that is transported from Mombasa Island annually to other towns in East and Central Africa (Kenha, 2013).

Logistic firms in Mombasa constitute a key component of Kenya's service sector in both their contribution to the country's employment and income generation and their role in external trade. Such include customer service by making sure the right product assortment and quantity are delivered in a timely fashion (Murage, 2011). Logistics firms are faced with a lot of challenges. Among the top challenges include escalating fuel prices, environmental degradation from waste produced by their machinery, green movement lobby groups that advocate for mandatory participation in environmental initiatives and Government regulations enforced via National Environmental Management Authority (NEMA) and Mombasa Municipal Council (MMC). GSCM is able to address these challenges by increasing energy efficiency, reduction of greenhouse gas (GHG) emissions, water conservation or processing, waste reduction, reduced packaging and increased use of biodegradable packaging (Garcia, 2013).



## **1.2 Research Problem**

Balancing economic and environmental performance has become increasingly important for organizations facing competitive, regulatory and community pressures. Environmental problems such as global warming, toxic substance usage, and decrease in non-replenish able resources has caught up amongst the people now (Shultz & Holbrook, 1999). The benefits of GSCM practices are positively correlated in terms of organization performance and competitiveness. This has made more organizations invest in GSCM practices which have led to benefits in terms of environmental and economic performance (Perotti, 2012).

The present day competitive environment characterizing business coupled with increased pressures for environmental sustainability has required organizations to embrace GSCM practices in producing their goods and services. Owing to environmental and ecological responsibility, organizations are encouraged to invest in GSCM practices to enhance their sustainability and competitiveness (Martha & Houston, 2010). A relationship between GSCM practices and competitiveness in logistics firms in Mombasa has not yet been established because no clear research has been conducted to prove this. As a result, there is need for research to establish the potential link between the level of GSCM adoption by logistics firms in Mombasa and competitiveness in order to provide a concrete reason for other logistic firms to make their green supply chain effective

The transport industry in Kenya is a global business and therefore there exists a need for the stakeholders in the industry to ensure that services offered are environmentally

friendly in order to remain competitive in the market. It is important for the industry players to embrace a GSCM model to enable them cut costs and to enable them to achieve sustainability in the supply chains. This is further curtailed by the ever increasing costs of energy and raw materials which have forced business to find new ways to reduce energy use in order to reduce costs. In Mombasa, various policies have been set up to cater for environmental concerns that surround logistical operations. Logistics operators have to get two licenses, NEMA certificate and MMC Standardization, before they are allowed to operate. But with massive corruption and illegal transactions that are practiced by these operators, some of these logistical firms continue with their operations without giving concern to the environment. Such loopholes make the implementation of GSCM practices expensive or extremely hard to implement.

Heying and Sanzero (2009) conducted a research on the supply chain management of Wal-Mart's Stores in California USA to establish the impact of green supply on operation costs. GSCM practices remain Wal-Mart's primary source of competitiveness in the retail/department store industry. Their distribution system is regarded as the most efficient and they have an approach to supply chain management that has long emphasized visibility through the sharing of information with their suppliers.

Murage (2011) carried out a research on green supply chain initiative and challenges by manufacturing firms in Kenya. The research found out that incentives on the manufacturers should be on the forefront in this course since only incentives with an economic benefit will entice the business community to embrace GSCM practices.

Omonge (2012) carried out a research to establish the role of green supply chain management practices on an organizational competitiveness among commercial banks in Kenya. It was concluded that different banks adopt different green supply chain practices depending on the activities that they are engaged in. Wamalwa (2014) conducted a research on sustainable supply chain management as a strategic tool for competitiveness in tea industry in Kenya. The findings of the research were that sustainable supply chain management as a strategic tool contributes to the competitiveness of Kenyan tea firms in the global market.

In regard to studies done before in Kenya, there is clearly a need to do further research on green supply chain management for logistics firm at county level. This is because there is no concrete research that has specifically looked at logistics firms only. From the foregoing discussion, the researcher poses the following question, what is the effect of adoption of GSCM practices on the competitiveness of logistics firms based in Mombasa County?

### **1.3 Research Objectives**

The general objective of the study was to determine the relationship between adoption of GSCM practices and competitiveness. The specific objectives are to

- i. Establish the GSCM practices which logistics firms in Mombasa County have adopted.
- ii. Determine the relationship between GSCM practices adoption and competitiveness of logistics firms in Mombasa County.

#### **1.4 Value of the Study**

The understanding of the GSCM practices adopted by logistical firms in Mombasa assists existing and upcoming firms to design targeted policies and programs that actively stimulate the growth and sustainability of the transport industry in the country. The study findings benefit the employees of these logistical firms by giving them insight into how their institutions can effectively manage their green supply chain practices. This study also creates a bar scale which is replicated in other sectors of the economy, especially the transportation industry. Most importantly, this research contributes to the literature on the green supply chain practices in firms especially in developing countries like Kenya. It is hoped that the findings of the research will be valuable to the academicians, who may have found useful research gaps that may stimulate interest in further research in future. Recommendations have been made on possible areas of future studies.

This study is further justified since it adds value to those interested in setting up their own logistical firm in the country since they are able to understand what to do right to succeed and what if done wrong would bring the business down.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Introduction**

The chapter looks at the theoretical foundations of which the study is anchored on. This is followed by analytical analysis of green supply chain practices. The chapter concludes by looking at the empirical reviews of the study and related studies done before.

### **2.2. Theoretical Foundation of the Study**

This study will be anchored on four theories namely; Institutional theory, resource based view, stakeholder theory and resource dependence theory. These are discussed in the following subsections

#### **2.2.1. Institutional Theory**

Institutional theory seeks to explain how external pressures that emerge from normal operations influence a firm's decisions and performance (Hirsch, 1975). Within institutional theory, there are three forms of isomorphic drivers namely, coercive, normative and mimetic (DiMaggio & Powell, 1983). Coercive isomorphic drivers occur from influences exerted by those in power. The coercive drivers are greatly used by managers to make decisions that can make an organization gain a competitive edge through their influence and power. Normative drivers are key aspects that cut across different cultures and boundaries. An organization that has normative edge appeals to a wide spectrum of consumers making it have a competitive edge over others. Mimetic drivers make organizations copy a successful organization in order to ape their winning combination. This often brings along a competitive edge to organizations that can successfully implement such decisions (DiMaggio & Powell, 1983).

Institutional theory can be used to study how a firm addresses green issues due to external pressure and thus institutional theory has become a major research direction to explain environmental related practices. These influences greatly affect the competitiveness of a firm that is currently operating in that external factors are critical in adopting a GSCM policy. The effectiveness of the GSCM policy will be determined by how strong the external factors will influence an organization. If the factors are weak, the adoption of GSCM policy will not be effective since GSCM policy is adopted to ensure environmental demands are met.

### **2.2.2. Resource Based View**

The resource-based model of competitiveness suggests that the competitiveness of a firm may be sustained by harnessing resources that are valuable, rare, imperfectly imitable, and non-substitutable (Barney, 1992). A firm's resources have been defined as all assets, capabilities, organizational processes, firm attributes, information, and knowledge controlled by an enterprise that enable the firm to conceive of and implement strategies with the goal to improve its efficiency and effectiveness (Daft, 1983).

GSCM policy requires a lot of resources to implement and sustain. The more resources an organization has the more effective their GSCM practices will be. An organization with enough resources has the capability to invest more resources thus bringing about economies of scale which is later passed on to consumers in terms of cheaper prices and better quality (Barney, 1992).

### **2.2.3. Stakeholder Theory**

Stakeholder theory suggests that firms produce externalities that affect many parties which are both internal and external to the firm. Externalities often cause stakeholders to increase pressures on firms to reduce negative impacts and increase positive ones. This theory suggests that firms produce externalities that affect many parties which are both internal and external to the firm. A firm that has resources that are valuable and rare to stakeholders brings about competitiveness (Barney, 1992).

Pressures from stakeholders influence the level of GSCM policy adoption. If the stakeholders demand an effective implementation of GSCM policies, an organization will be compelled to adopt it in order to maintain its competitiveness. The stakeholders' theory explains that a firm's competitiveness results from its strategic choice that provides the firm a better positioning in the industry structure. These strategic choices are made by the stake holders, (Lai, 2004).

### **2.2.4 Resource Dependency Theory**

Resource dependence theory (RDT) suggests that, in the supply chain, member firms should be dependent and collaborate to seek higher performance gains and competitiveness in the long-run instead of pursuing short-term benefits at the expense of others. In RDT, firms are dependent on resources provided by others in order to sustain growth, as well as other organizations that may be independent on them (Pfeffer & Salancik, 1978). One important assumption of the RDT is that firms cannot be fully self-sufficient with regards to strategically critical resources for survival.

Resource dependency theory states that dependency leads to exclusivity in market share. An organization that is able to produce its own inputs has the ability to penetrate new markets easily hence controlling a large market share. Making resources unavailable to competitors makes an organization have competitiveness since they can sell it expensively to make the competitors' products and services expensive and unaffordable (Pfeffer & Salancik, 1978).

### **2.3. GSCM practices**

GSCM practices are activities performed by an organization in order to minimize their impact on the natural resources and environment (Perotti, 2012). Zhu & Sarkis, (2004) indicate that quality management in an organization catalyzes and boosts the implementation of GSCM. They suggest that under strict quality control measures, organizations can improve their environmental practice by observing from experiences of their quality management programs that are brought by the level of GSCM practices they have invested in. There are three GSCM practices that affect a logistics firm organizations performance, these are green logistics, green procurement and reverse logistics. These are outlined further below.

#### **2.3.1. Green Logistics**

Green logistics is an operation under green practices that aims to move and deliver raw materials and products at the lowest possible cost while maintaining the highest standards and minimizing environmental impact in the process (Hsu & Hu, 2008). Management of



wastes in the outbound function of waste exchange can lead to cost savings and enhance competitiveness (Rao, 2003). In an eco-transportation system, required parameters of a transportation system such as type of transport, fuel sources, infrastructure, operational practices and organization, must be taken into account and considered seriously. These functions and the implementation determine the environmental impact generated in the transportation logistics phase of the supply chain (Angell & Klassen, 1999).

Green logistics have five drivers that it seeks to address. These are aimed at controlling mounting energy costs, addressing Worldwide alarms among corporate over GHG (Green House Gases) emissions, controlling climate change, addressing regulations such as EPA (Environmental Protection Agency) and Improving community awareness of environmental issues. Activities which logistics firm undertake under green logistics include green packaging, control measurements on processes, route optimization, load optimization, customer response, intensification of activities and emissions to the environment (Lee & Klassen, 2008).

Modern logistics consists of some crucial elements and actions, which must be consecutively used and adequately combined to achieve the logistics optimum. This optimum can be expressed in cost, time or energy savings. Modern means of transport, manipulation equipment, modern warehouses and concepts as just-in-time and door-to-door are key elements of Green logistics. Combining all elements is an issue of supply chain management, which starts in the production and ends on the retailer's shelf, (Kazemzadeh, 2008).

### **2.3.2. Green Procurement**

These are all activities involved in purchasing products and services that cause minimal adverse environmental impacts. It incorporates human health and environmental concerns into the search for high quality products and services at competitive prices (Lee & Klassen, 2008). The activities of green procurement in cooperates the selection of products and services that minimize environmental impacts. It requires a firm to carry out an assessment of the environmental consequences of a product at all the various stages of its lifecycle. This means considering the costs of securing raw materials, and manufacturing, transporting, storing, handling, using and disposing of the product.

Organizations that invest in Green procurement ensure that their purchase must look at various elements. These include purchasing goods that have improved recyclability, greater efficiency, products that operate on green technology, goods that used reduced water consumption, goods that emit fewer toxic during use and installation, goods that have reduced packing and greater durability and goods that produce minimal waste when recycling (Lee & Klassen, 2008). Green procurement also offers cost savings. Buying 'green' usually involves products that are easily recycled, last longer or produce less waste. Money is therefore saved on waste disposal. In addition, green products generally require fewer resources to manufacture and operate, so savings can be made on energy, water, fuel and other natural resources. Green products involve fewer toxic or hazardous materials, reducing associated expenses such as permit fees, toxic materials handling charges and staff training (Baenasa, Castro, Battistellea & Junior, 2010).

### **2.3.3 Reverse Logistics**

This refers to all operations related to the reuse of products and materials. It involves moving goods from their typical final destination for the purpose of capturing value, proper disposal, remanufacturing or refurbishing. The reverse logistics process includes the management and the sale of surplus as well as returned equipment and products from the customers who have used them. Reverse logistics also include 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 value or proper disposal. More precisely, reverse logistics is the process of moving goods from their typical final destination for the purpose of capturing value, or proper disposal. Remanufacturing and refurbishing activities also may be included in the definition of reverse logistics (Hawks, 2006). Reverse logistics is more than reusing containers and recycling packaging materials. Redesigning packaging to use less material, or reducing the energy and pollution from transportation are important activities, but they might be secondary to the real importance of overall reverse logistics.

Reverse logistics ensure environmental efficiency by enhancing sustainable redistribution of any unused item back to the manufacturer. Reverse logistics consider societal cost, impact of future recycling, reducing inputs and output waste, ethical methods of disposals and quality of life in their operations. Reverse logistics also includes processing returned merchandise due to damage, seasonal inventory, restock, salvage, recalls, and excess inventory. It also includes recycling programs, hazardous

material programs, obsolete equipment disposition, and asset recovery (Baenasa et al. 2010).

#### **2.4. Determinants of Competitiveness**

The competitiveness of firms operating from a particular location is determined not only by firm own performance, but also by a multitude of other factors in the business environment from which it operates. Factors that make organizations unique and have an edge over others when it comes to their competitiveness are age and size (Stulz, 2007).

When it comes to age, the number of years an organization has been operational help them to become more efficient. This is because over time, organizations discover what they are really good at and efficiently learn how to perform better in their daily routine (Fortes, 2009). These firms specialize and find methods of standardizing, coordinating and speeding up their production processes (Stulz, 2007). An organizations age greatly determines how well they can implement a GSCM policy.

An organization size determines how a GSCM policy will be implemented and affected. A large organization with a huge task force is able to fully implement a policy easily and effectively because it possesses a huge workforce and appropriate equipment to easily implement a working policy. Large organizations that have the financial muscle and personnel can easily penetrate new markets and establish a brand as compared to upstart businesses (Fortes, 2009). The competitiveness of firms operating from a particular location is determined not only by firm own performance, but also by a multitude of other factors in the business environment from which it operates. Factors that make

organizations unique and have an edge over others when it comes to their operational efficiency are outlined below.

## **2.5. Empirical Review**

Several studies have been conducted to show the relationship between GSCM practices and competitiveness. The studies aimed at establishing a positive correlation between firms practicing GSCM practices and organizational performance and competitiveness.

Li (2008) carried out a study linking GSCM practices and organizational performance of the top traded firms in the United States of America NSE. The study concluded that manufacturing firms scored lower on the environmental impact metric of competitiveness and higher on the green reputation metric than firms in the service industry. Studies carried out by Deshmukh (2001), recognize the growing nature of environmental matters in the manufacturing and operations organizations of China and advocated for more research especially in environmentally polluted regions in order to make organizations competitive due to increased awareness of environmental concerns

An empirical study carried out by Meera (2014), used survey methods to study 155 industries in Tamilnadu, India. The study investigated the pressure for implementing GSCM practices and the relationship between GSCM practices and competitiveness. They were able to create a model that described the relationship between GSCM pressures, GSCM practices and competitiveness.

Testa and Iraldo (2010) conducted a study that looked at the external factors that influence GSCM practices. This study explored internal factors, such as strategic motivations, existing strategic management and competitiveness. It analyzed survey data collected by the organization for economic co-operation and development (OECD) of over 4000 manufacturing facilities with at least 50 employees. The study concluded that GSCM practices did not have such a substantial impact on competitiveness in terms of the profitability of a firm. This is because the assets of GSCM practices are more intangible and do not result in short-term increases in profitability.

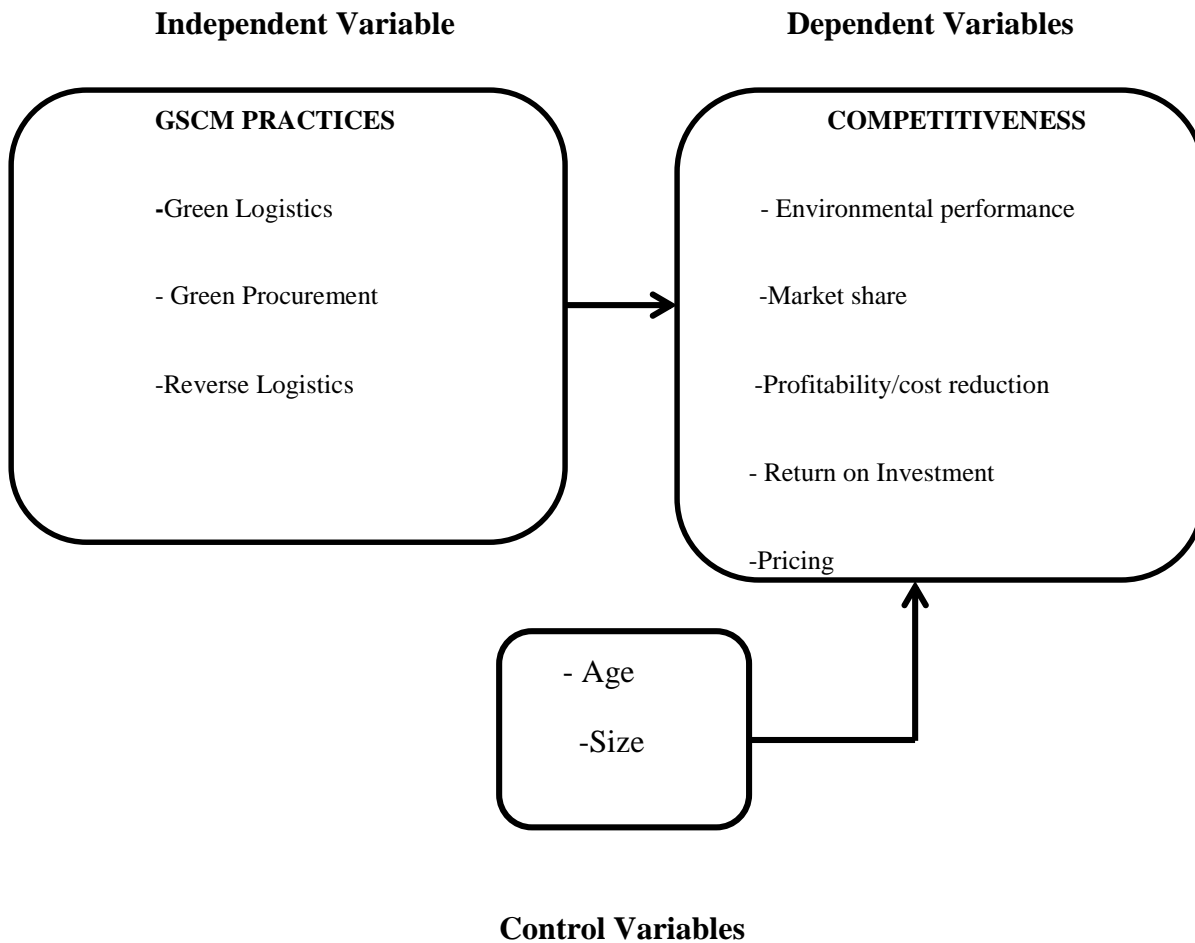
GSCM is a concept that has been in Kenya and the whole world for many years and quite a number of studies have been done locally to see whether GSCM has benefits if it is adopted. However, very few studies done have looked at the relationship between GSCM practices and competitiveness of logistic firms.

Chege (2010) conducted a study on green supply chain management practices and supply chain performance of private hospitals in Nairobi, Kenya. The study aimed at determining the various GSCM practices and their impact on Supply Chain Performance. On GSCM practices, a low but significant relationship was found while on green operations the relationship with supply chain performance showed that there was high significant, on reverse logistics and outbound logistics the significance level was high, as well as purchasing and in-bound logistics.

Okello and Were (2014) carried out a study on the influence of supply chain management practices on performance of the food manufacturing firms in Nairobi. The main purpose of this study was to find out the influence of supply chain practices on the performance of food manufacturing firms in Nairobi Kenya and whether it leads to competitiveness. The findings concluded that lead time affects the performance of food manufacturing firms in Kenya and technology affects the performance of food manufacturing firms in Nairobi Kenya.

## 2.6. Conceptual Framework

The aim of this chapter is to introduce the conceptual framework that will be used for this study. The conceptual framework is based on the findings presented in the literature review; it provides the framework for the research design and data analysis.





## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1. Introduction**

The chapter describes the research method that was used. This includes the research design, the target population, sampling design, data collection instruments and the techniques for data analysis.

### **3.2 Research Design**

The study adopted a descriptive survey research design. This is usually used to gather information without changing the environment or manipulating data. It is used to obtain information concerning the current situation or phenomena, (Kay, 1997). This research design was deemed appropriate for this study because it allowed drawing of conclusions about the effect of the GSCM practices on a firm's competitiveness. The descriptive survey design was also used since different logistics firms in Mombasa were surveyed.

### **3.3. Population of the Study**

The population of the study was all logistics firm registered in Mombasa County. According to National Transport and Safety Authority department, under the ministry of Transport, there are 876 logistics firms registered to operate in Mombasa County as at 31<sup>st</sup> December 2014.

### **3.4. Sample Design**

The study employed the simple random sampling technique. This is because it eliminates bias by giving all logistics firms an equal chance of being chosen for study (Kay, 1997). The sample size was 50 logistics firms registered by the Transport and Safety Authority department. This sample size was justified because the population of the study was huge

and the data analysis would require at least 50 firms to come up with a concrete and conclusive report, given that we expect a response rate of about 70%. This means that the data collected was to be accurate and would be obtained with relative ease. The study also established a regression and correlation analysis between the dependent variable and the independent variables.

### **3.5. Data Collection**

This study used primary data that was collected by the use of a questionnaire. The questionnaire's was administered using the drop and pick later method. The questionnaire consisted of 3 sections divided into demographics, GSCM practices adopted by the firm and levels of competitiveness a firm has. The target of the questionnaire was the general manager of the organization because they are well placed to answer the questions since they possess knowledge and experience on the type of data needed to be used.

### **3.6. Data Analysis**

The data was classified, tabulated checked for completeness, consistency and accuracy. The data was then coded and presented in tables. The data used to achieve the objective of the study was the mean and standard deviation. Measurement of GSCM practices was analyzed on the basis of how long a firm has been practicing GSCM and how much they have invested in it. Data on competitiveness was analyzed on the market share a firm controls and its turnover. Data on green procurement was analyzed on the organization expenditure on promoting GSCM practices. A multiple regression model was developed to describe the relationship between the organizations GSCM practices and competitiveness.

The Regression model :

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \varepsilon$$

Where Y is Competitiveness

$\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ , = Constants

$X_1$ = Green Logistics

$X_5$  = Size

$X_2$ = Green Procurement

$\varepsilon$  = Error term

$X_3$ = Reverse logistics

$X_4$ = Age

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

### **4.1 Introduction**

This chapter introduces the analysis of the data collected and interpreted on the GSCM practices and competitiveness of logistics firms in Mombasa County. Out of a total of 50 questionnaires issued, 38 responded which was a 76% response rate. The response rate is considered to be adequate to constitute a basis for valid conclusion.

### **4.2 Background Information**

#### **4.2.1 Length of Time in Operation**

Table 4.1 illustrates the percentage of the length of time firms have been in operation. According to table 4.1, 0% of the firms have been operating for less than one (1) year, 5.3% have been operating between one and five (1-5) years, 47.4% of the firms between five and ten (5-10) years, 28.95% of the firms between ten and fifteen (10-15) years while the remaining 18.4% of the firms have been operational for over fifteen (15) years. These findings illustrate that majority of the logistics firms have been operational for more than five years. This implies that the firms have been in operation for long to recognize the environmental impact of their operations and hence realize the value of adopting GSCM practices.

**Table 4.1: Length of Time in Operation**

<b>Time</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Less than 1 year	0	0
1-5 years	2	5.3
5-10 years	18	47.4
10-15 years	11	28.9
Over 15 years	7	18.4
<b>Total</b>	<b>38</b>	<b>100</b>

#### **4.2.2 Number of Employees**

Table 4.2 illustrates the percentage of the size of the staff of the logistics firms in Mombasa County. From the findings, Zero percent had less than ten (10) employees, 73.7% of the firms had between ten and fifty (10-50) employees, 13.2% had between fifty to one hundred (50-100) employees, 13.2% had between one hundred and one thousand (100-1000) employees and none had over a thousand employees. This research findings show that majority of the logistics firms had between fifty and one hundred employees. This implies that majority of the logistics firms had many logistics machinery that needed little manpower due to the automated nature of these machinery. This implies that these logistics firms require a lot of raw materials which usually have a negative impact on the environment once used. Adoption of GSCM practices is thus crucial in order to reduce negative environmental effect of logistics firms operations.

**Table 4.2: Number of Employees**

<b>Number of Employees</b>	<b>Frequency</b>	<b>Percentage</b>
Less than 10	0	0
10-50	28	73.7
50-100	5	13.2
100-1000	5	13.2
More than 1000	0	0
<b>Total</b>	<b>38</b>	<b>100</b>

#### **4.2.3 Whether Firm has an Environmental Management Department**

Table 4.3 illustrates the percentage of logistics firms in Mombasa that had an established environmental management department that actively conducted its duties to ensure environmental standards were met. The respondents indicated that 76.3% of the firms had an environmental department while 23.7% did not. This is a clear indicator that majority of the firms surveyed were conducting green practices in their operations.

**Table 4.3: Environmental Management Department**

<b>Presence of Environmental Department</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Yes	29	76.3
No	9	23.7
<b>Total</b>	<b>38</b>	<b>100</b>

#### 4.2.4 Registration with Environmental Management Body

Table 4.5 shows the percentage of the logistics firms in Mombasa County that were registered with an environmental management body. The table illustrates that 73.7% were registered while 26.3% were not. These findings indicate that majority of logistics firms in Mombasa were registered to at least one environmental management body. This implies that external pressures such as government legislation, customers' demands and increased environmental awareness among firms has played a key role in ensuring that these firms adopt GSCM policies.

**Table 4.4: Registration with Environmental Management Body**

<b>Registration with Environment Body</b>	<b>Frequency</b>	<b>Percentage</b>
Yes	28	73.7
No	10	26.3
<b>Total</b>	<b>38</b>	<b>100</b>

#### 4.2.5 Environmental Certification

Table 4.5 illustrates the percentage of logistics firms in Mombasa County that have received environmental certification that aims at recognizing their efforts in conserving the environment and adopting GSCM practices. 36.8% of logistics firms had attained at least one level of environmental certification while 63.2% had not yet attained any certification. This demonstrates that as much as the logistics firms practice GSCM, majority are yet to invest more in order to achieve certification levels.

**Table 4.5: Environmental Certification**

<b>Environmental Certification</b>	<b>Frequency</b>	<b>Percentage %</b>
Yes	14	36.8
No	24	63.2
<b>Total</b>	<b>38</b>	<b>100</b>

### **4.3. Adoption of Green Procurement**

This section highlights the extent to which logistics firms in Mombasa have adopted green procurement practices in their operations. To measure the extent to which these practices were adopted, a 5- point Likert scale was used with: 1 representing No extent at all, 2- small extent, 3-moderate extent, 4-large extent and 5- very large extent

Table 4.6 shows the results, from the table the most adopted green procurement practice is where the organization keeps a record of all its purchases to ensure accountability and easy tracking of all its inputs with a mean score of 3.79. This is followed by whether the organization packaging is made of recyclable materials with a mean score of 3.47. This is followed by whether the organization gives feedback to suppliers on supplies that are not environmentally friendly with a mean of 3.45. The feedback confirms earlier findings that suggest that most logistics firms operate a large fleet hence are very cautious as to where they get their supplies from in order to reduce waste and costs. Records are important to trace any wastage hence most logistics firms give feedback to their suppliers of what raw materials they require to make their operations successful.



The least adopted green procurement practice is whereby the organizations collaborate with suppliers in providing safe and environmentally safe services with a mean score of 2.79 and whereby the suppliers to the logistics firm have to show compliance with particular regulations that protect the environment with a mean score of 2.84. This implies that most logistics firms do not employ a good relationship with suppliers in long term pollution prevention practices and prefer to employ these practices themselves. This also demonstrates that most logistics firms do not possess the expertise to effectively and efficiently adopt a green procurement practice alongside other stakeholders in the same industry.

Other practices cited included, the organization sources its products from ISO certified suppliers (3.03), the organization discloses to its customers its source of inputs (2.95), the organization carries tests on its inputs to ensure they are environmentally safe (3.0) and the organization gives feedback to suppliers on supplies that are not environmentally friendly (3.45). The overall mean was 3.16 which indicates that most firms are at the planning and implementation stage of practicing green procurement practices.

**Table 4.6: Green Procurement Adoption**

<b>Green Procurement Practice</b>	<b>Mean</b>	<b>Std Deviation</b>	<b>Ranking</b>
The organization keeps records of all its purchases to ensure accountability and easy tracking of all its inputs.	3.79	0.905177	1
Does the organization purchase packaging made of recyclable materials?	3.47	0.861703	2
The organization gives feedback to suppliers on	3.45	0.828459	3

supplies that are not environmentally friendly.			
The organization sources its products from ISO certified suppliers.	3.03	0.914946	4
The organization carries tests on its inputs to ensure they are environmentally safe.	3.00	0.7711	5
The organization discloses to its customers its source of inputs	2.95	0.803619	6
The suppliers to the organization have to show compliance with particular regulations that protect the environment.	2.84	0.82286	7
The organizations collaborate with suppliers in providing safe and environmentally safe services.	2.79	0.843349	8
<b>Overall Mean</b>	<b>3.16</b>		

#### 4.4. Adoption of Reverse Logistics

This section highlights the level which logistics firms in Mombasa have adopted reverse logistics in their operations. To measure the extent to which these practices were adopted, a 5- point Likert scale was used with: 1 representing No extent at all, 2- small extent, 3- moderate extent, 4-large extent and 5- very large extent.

Table 4.7 shows the results, from the table, companies that creates market for waste products it cannot consume internally had a mean score of (3.42), followed by organization manages the risks associated with reverse logistics (3.34), The organization consumes internally. They consume waste and scrap internally (3.16) and the organization has a waste policy as to waste sorting, increased use of recycled materials, and reducing waste amounts (3.11). This indicates that most logistics firms try to reuse

waste product they produce but are usually very careful hence cannot fully maximize on recycled products. This means that these firms could derive more benefits by reducing the amount of waste they produce. These results also mean that these logistics firms are competing amongst other stakeholders in the industry for waste materials produced hence the need to invest in recycling waste products. External pressure from stakeholders to adopt GSCM practices is also a key factor for logistics firms if they are to operate competitively with other firms. This usually enables an organization reduce costs by saving on materials and gaining good reputation that enables the firm operate efficiently and effectively.

The least perceived activities from the results were, the organization has invested in activities that ensure any waste after delivery is returned for recycling and reuse (2.63), the organization caters fully for reverse logistics costs- No customer charges (2.84) and the organization shares its environmental management techniques with other firms in the industry (2.97). This means that logistics firms heavily outsource recycling activities as they do not want to invest in the activity, or they want to avoid the risks that come about with using recycled materials in their operations. This means that most logistics firms do not have a long term strategy of adopting GSCM practices.

Other practices cited include, the organization has a collection point for goods meant for recycling (3.05), there is departmental collaboration, communication and cooperation in reverse logistics (3.05) and The Organization provides its customers with information and training regarding reverse logistics (3.00). Overall mean was 3.06 indicating that most logistics firms have invested in reverse logistics since it has significant benefits.

**Table 4.7: Adoption of Reverse Logistics**

<b>Reverse Logistics practice</b>	<b>Mean</b>	<b>Std Deviation</b>	<b>Ranking</b>
The organization creates market for waste products it cannot consume internally.	3.42	1.00355	1
The organization manages the risks associated with reverse logistics	3.34	0.780724	2
The organization consumes internally. They consume waste and scrap internally	3.16	0.754314	3
The organization has a waste policy as to waste sorting, increased use of recycled materials, and reducing waste amounts	3.11	0.68928	4
The organization has a collection point for goods meant for recycling.	3.05	0.92845	5
There is departmental collaboration, communication and cooperation in reverse logistics.	3.05	0.803619	6
The Organization provides its customers with information and training regarding reverse logistics	3.00	0.657596	7
The organization shares its environmental management techniques with other firms in the industry	2.97	0.884914	8
The organization caters fully for reverse logistics costs- No customer charges	2.84	0.754314	9
the organization has invested in activities that ensure any waste after delivery is returned for recycling and reuse	2.63	0.785719	10
<b>Overall Mean</b>	<b>3.06</b>		

#### **4.5 Adoption of Green Logistics**

This section highlights the level which logistics firms in Mombasa have adopted green logistics in their operations. To measure the extent to which these practices were adopted, a 5- point Likert scale was used with: 1 representing No extent at all, 2- small extent, 3- moderate extent, 4-large extent and 5- very large extent.

Table 4.8 shows the results, from the table, firms that trains its employees on green distribution services had a mean score of (3.47), followed by firms that engage in designing eco-efficient routes and environmental risk analysis before dispatching products for transport (3.37) and organizations that complies with the environmental demands of the local authority (3.29). This implies that logistics firms are keen to follow environmental regulations set in their operations to avoid incurring penalties and other related costs. It also implies that logistic firms invest heavily in training their employees on green practices so as to enable them fully implement GSCM practices while using environmentally friendly routes that reduce waste and pollution.

The least perceived activities from the results were, the firm adopts new technology that promotes green distribution (2.89), the organization has invested in activities that ensure products are delivered using a green distribution system (3.00) and the firm engages in information gathering and tracking to assess their GSCM performance (3.11). This implies that as much as firms want to engage in GSCM practices, financial constraints restrict their level of investment. This is because implementing new GSCM practices means purchasing new and reliable machinery which are usually expensive and out of reach to many logistics firms in Mombasa.

Other practices cited include, the firms engage in energy conservation, fuel recovery and uses efficient equipment (3.24), the firms has included GSCM in its strategic planning process and gets commitment from senior managers (3.21) and the organization has a transport policy that ensures equipment’s producing harmful emissions are serviced and written off (3.18)

**Table 4.8: Adoption of Green Logistics**

<b>Green Logistics practice</b>	<b>Mean</b>	<b>Std Deviation</b>	<b>Ranking</b>
The organization trains its employees on Green Distribution practices	3.47	0.951154	1
The organization engages in designing eco-efficient routes and environmental risk analysis before dispatching products for transport.	3.37	0.819395	2
The organization complies with the environmental demands of the local authority.	3.29	0.767865	3
The organization engages in energy conservation, fuel recovery and uses energy efficient equipment.	3.24	0.786171	4
The organization has included GSCM in its strategic planning process and gets commitment from senior managers.	3.21	0.843349	5
The Organization has a transport policy that ensures equipment’s producing harmful emissions are serviced or written off	3.18	0.691855	6

The organization engages in information gathering and tracking to assess their GSCM performance.	3.11	0.863352	7
The organization has invested in activities that ensure products are delivered using a green distribution system.	3.00	0.805387	8
The organization adopts new technology that promotes green distribution.	2.89	0.863352	9
<b>Overall Mean</b>	<b>3.20</b>		

#### 4.6. Organization Competitiveness

This section highlights the level to which logistics firms in Mombasa consider themselves to be competitive relative to other competing firms. To measure the extent to which an organizations is competitive, a 5- point Likert scale was used with: 1 representing No extent at all, 2- small extent, 3-moderate extent, 4-large extent and 5- very large extent.

Table 4.9 shows the results. From the table, firms that perceived to be competitive on increase in customer base (3.6), corporate image (3.5), adoption of green supply chain management procedures (3.29) and increase in market share (3.26). This implies that logistics firms have shifted their focus from the traditional oriented model of making profits to a newer model that aims at increasing market share by having a good corporate image. Environmentally safe services appeal to a wider customer base hence logistics companies aim at adopting GSCM practices to achieve a wider market share.

The least competitive indicator from the results was increase in share value/ dividend payment (2.84), profitability (3.11) and Increase in customer loyalty (3.13). This implies

that logistics firms are keen on investing in GSCM practices that would allow them to make profits and gain customer loyalty in the long run. Most logistic firms in Mombasa had not yet fully invested in GSCM practices to enable them maximize on their returns. Other measures included operational performance (3.24), cost reduction (3.26) and implementation of Government regulations (3.18).

**Table 4.9 Organization Competitiveness**

<b>Organization Competitiveness</b>	<b>Mean</b>	<b>Std Deviation</b>	<b>Ranking</b>
Increase in Customer base	3.61	0.88652	1
Corporate Image	3.50	0.892915	2
Adoption of GSCM procedures	3.29	0.835299	3
Increase in Market Share	3.26	1.004966	4
Cost reduction	3.26	0.882902	5
Operational performance	3.24	0.883305	6
Implementation of Government regulations	3.18	0.800515	7
Increase in Customer loyalty	3.13	0.843771	8
Profitability	3.11	0.798291	9
Increase in share value / dividend payment	2.84	0.593948	10
<b>Overall Mean</b>	<b>3.24</b>		



#### 4.7 GSCM and Competitiveness

A relationship between GSCM practices and competitiveness had to be investigated and established whether it existed. The data was analyzed and calculated to come up with the below deductions.

**Table 4.10 ANOVA Table**

ANOVA <sup>a</sup>					
Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	55.745	5	11.149	174.396	.001
Residual	2.048	32	.064		
Total	57.793	37			

a. Dependent Variable: Competitiveness

b. Predictors: (Constant), Green Logistics, Green Procurement, Reverse Logistics, Age, Size

From the ANOVA table above, the value of F statistic is 174.396 which is greater than  $F_c = 2.51$  at 95% confidence interval. Since  $F = 174.396 > F_c = 2.51$  we conclude that not all the coefficient estimates of the predictor variables are equal to zero. This implies that green logistic, green procurement, reverse logistics, age and size have relationship with and have effect on firms' competitiveness. This is further confirmed by the p value = 0.001 < which less than 0.05 at  $\alpha = 0.05$ .

**Table 4.11 Model Summary**

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.835 <sup>a</sup>	.697	.693	.253

a. Predictors: (Constant), Green Logistics, Green Procurement, Reverse Logistics, Age, Size

From the model summary table above, the Adjusted R Square value is 0.693. This implies that 69.3% of the variation in the response variable, competitiveness is explained by the model.

This confirms model fitness and further indicates that there is a strong relationship between the response variable and the predictor variables. Adjusted R Square is used for reporting model fitness rather than R Square because Adjusted R Square value is controlled and does not increase when non-significant variables are added to the model. This is unlike R Square which increases indefinitely with increase in the number of predictor variables in the model.

A relationship between GSCM and competitiveness was established. A multiple linear regression model was run and the results obtained were analyzed and interpreted.

**Table 4.12 Model Coefficients Table**

Model	Unstandardized Co-efficient		Standardized Coefficients	t	Sig
	B	Std. Error	Beta		
Constant	2.456	1.24		1.981	0.57
X1	0.377	0.168	0.333	2.238	.033*
X2	0.275	0.205	0.218	1.338	0.19
X3	0.1	0.16	0.386	0.629	0.534
X4	0.266	0.182	0.386	-1.384	0.176
X5	0.55	0.223	0.432	0.464	.019*

5% level of significance\*

From the table above, we obtained coefficients' estimates of the model as shown below

$$\beta_0 = 2.456$$

$$\beta_2 = 0.275$$

$$\beta_1 = 0.377$$

$$\beta_3 = 0.100$$

$$\beta_4 = 0.266$$

$$\beta_5 = 0.550$$

We fit the above coefficient estimates in our model and obtain the model equation

$$Y = 2.456 + 0.377X_1 + 0.275X_2 + 0.100X_3 + 0.266X_4 + 0.550X_5$$

Where:

$Y$  = Competitiveness

$X_1$  = Green Logistics

$X_2$  = Green Procurement

$X_3$  = Reverse Logistics

$X_4$  = Age

$X_5$  = Size

From Table 4.10, Green Logistic and Size were found to be statistically significant predictor variables at  $\alpha=0.05$  level of significance with p-values 0.033 and 0.019 respectively. While Green Procurement, Reverse Logistics and Age with p-values 0.190, 0.534 and 0.176 respectively were found not to have a statistically significant relationship with competitiveness in the model at  $\alpha=0.05$  level of significance.

However, all the predictor variables had a positive relationship with the response variable implying that an increase in green logistic, green procurement, reverse logistic, age and size of a firm led to the firm being more competitive. From the model equation, each of the predictor variables has a relationship with the response variable and is interpreted as below:

Green Logistics regression coefficient is 0.377 implying that holding all other predictor variables constant, a unit increase in green logistic resulted in increase of the firm's

competitiveness by 0.377. Green procurement regression coefficient is 0.275 implying that holding all other predictor variables constant, a unit increase in green procurement resulted into an increase in the firm's competitiveness by 0.275. Reverse logistic regression coefficient is 0.100 implying that holding all other predictor variables constant, a unit increase in reverse logistic resulted in an increase in the firm's competitiveness by 0.100.

Age regression coefficient is 0.266 implying that holding all other predictor variables constant, a unit increase in Age resulted in an increase in the firm's competitiveness by 0.266. Size regression coefficient is 0.550 implying that holding all other predictor variables constant, a unit increase in size resulted in an increase in the firm's competitiveness by 0.550. From the analysis, it was found out that two of the predictor variables were statistically significant. However, all the variables had positive relationship with firm's competitiveness.

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

### **5.1 Introduction**

In this chapter, the researcher summarizes findings from this study and provides the conclusions. The research also presents recommendations on areas that were set up to have gaps. Lastly, the researcher closes with suggestions on areas that needed further research on this topic.

### **5.2 Summary**

The aim of this study was to ascertain the relationship between competitiveness and adoption of green GSCM practices by logistics firms in Mombasa County, Kenya. The survey also sought to determine perceived benefits of adopting GSCM practices, and factors influencing adoption of GSCM practices by these logistics firms. This section draws conclusions from the research findings in this study.

Research findings show that the majority of the firms: had been in operation between 5-10 years (47.37%), and had between 10-50 employees (71.05%), further 73.68% of the firms were registered with an environmental management body and 76.32% of the firms had established an environmental department. All of the firms surveyed were practicing GSCM practices. This shows these firms had well established systems to manage their environment.

The study also showed that the most adopted GSCM practices were where the organization keeps records of all its purchases to ensure accountability and easy tracking of all its inputs, where the organization purchase packaging made of recyclable materials, where the organization creates market for waste products it cannot consume internally and where the organization trains its employees on Green Distribution practices. These activities were highly invested in because they are not capital intensive and require little labor to implement.

The least adopted practices were where the organizations collaborate with suppliers in providing safe and environmentally safe services, where the organization caters fully for reverse logistics costs and where the organization had invested in activities that ensure any waste after delivery is returned for recycling and reuse. This established that most logistics firms were keen on investing in GSCM practices but budget constraints and limited skilled labor constrained its adoption. Many logistics firms also did not want to collaborate with outside firms in adopting GSCM practices because they preferred to be autonomous in their operations.

The study also established that most firms did not have environmental certification in their operations due to the fact that bodies that accredit logistics firms in Mombasa are few and do not encourage these firms to get accredited. The perception by the logistics firms are that local environmental certification do not add value to their business hence the reason most firms do not bother getting accredited. Another perception is that these accreditation are not conversant with many of their clients hence proving the fact that even though customers are aware of GSCM practices, few would want to know specific details of a logistics firms GSCM practices.

The study finally established that there are only two environmental certificates that a logistics firms needs to acquire before operating. These were namely MMC certification and NEMA certification, which are relatively easy to acquire since they do not have strict regulations. This has severely hampered the adoption of GSCM by most logistics firms in Mombasa County.

### **5.3. Conclusions**

The study concludes that concern for environment and organizational sustainability are increasing and that respondents are aware of the effects of GSCM practices but not very conversant on how it efficiently impacts on competitiveness, hence reluctance in adopting GSCM practices. This conclusion agrees with previous studies done before expounding on how GSCM practices are positively correlated with competitiveness. As stated by Hook (2000), GSCM is an important innovation that helps an organization develop strategies that achieve profit and market share objectives by lowering their environmental risk and impacts, while raising their ecological efficiency.

The study also concludes that most logistics firms in Mombasa County are at the planning phase of adopting GSCM practices and some of the firms had subscribed to the environmental bodies. A significant number of these firms were subject to environmental management audits but most firms have been left to run their businesses independently without close monitoring on their operational efficiency. This is in comparison with previous studies done before whereby organizations which apply scientific methods in their operations gain distinctive competitive advantage over their peers (Mehmeet, 2005).

The study finally concludes that most logistics firms are running on a model that aims at keeping operational costs at the minimal level hence the low adoption of GSCM practices. Perceived benefits of GSCM are outweighed by the monetary investment of plant and machinery to support the practice. Also the employees conversant with GSCM practices are relatively low due to lack of training. The desire to reduce operational costs was found also to represent a common influence force for GSCM practices by other studies (Lutz, 2005).

#### **5.4 Recommendations**

Based on the conclusion drawn in section 5.3 above, the researcher made the following conclusions: There is need to increase awareness on GSCM practices on the enhancement of operational performance in the logistics industry in Mombasa, this will assist in reducing the environmental degradation associated with logistics firms. There is also need to adopt various GSCM practices through government legislations. Environmental bodies should have the power to shut down non-compliant firms and should invest more on monitoring procedures to close loopholes that make logistics firms operate freely or using illegal practices. The government should also increase more environmental regulators in the logistics industry e.g. Kenya bureau of standards (KEBS).

Firms also need to ensure they utilize recycled items when procuring their inputs as opposed to using cheaper imports which degrade the environment. Finally, logistics firms in Mombasa should consider adopting GSCM policy fully so as to make them competitive with emerging new methods of transportation and international competition.



## **5.5 Recommendations for Further Research**

The results of this study can be further utilized to suggest several directions for future research. A field study can focus on investigating demands by customers and whether there is any preference in demand of services from companies that practice GSCM practices in comparison to other organizations that do not practice GSCM practices. Additionally, logistics managers need to develop GSCM skills and knowledge in order to effectively manage an organization. They need to focus on improving GSCM practices in order to improve organizational performance.

The researcher also recommends further research on government rules and legislation that guide the operations of logistics firms. GSCM is a new concept that needs new policies to assist in firms to have a harmonized structure that enables uniformity in operations.

## **5.6 Limitations of the Study**

This study was limited by the fact that some of the respondents deemed the information required as confidential. As such, some questions were left unanswered. Also, only one sector of the industry was covered, that is logistics companies. More study should be extended in other industrial sectors. Finally, time and resources were limited to the researcher like the questionnaires were administered on drop and pick later method that proved to be very time consuming and used a lot of resources.

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## **Appendix 1: Cover letter**

Marvin Tana,  
P.O. Box 6633- 00200,  
**Nairobi.**

September, 2015

Dear Respondent,

### **RE: RESEARCH QUESTIONNAIRE**

This questionnaire (attached) is designed to gather information on the role of green supply chain management practices on competitiveness of logistics firms in Mombasa County, Kenya. This study is being carried out for a management project paper as a requirement in partial fulfillment of the Master of Business Administration, University of Nairobi

Please note that this is strictly an academic exercise towards the attainment of the above purpose. You are hereby assured that the information will be treated with the strictest confidence. Your co-operation will be highly appreciated.

Thank you for your anticipated kind response.

**Yours Sincerely,**  
**Marvin Tana**



**Appendix 2: Questionnaire**  
**RESEARCH QUESTIONNAIRE**

**Section I: General information of the respondents.**

1. For how long has your organization been operating?.....years.

2. How many employees does your organization currently employ?.....

3. Does your organization have an EMD (Environmental Management Division)?  
Yes [ ] No [ ]

4. Does your organization practice green supply chain practices?  
Yes [ ] No [ ]

5. Is your organization registered with any environmental management bodies?  
Yes [ ] No [ ]

If yes, kindly state the environmental management bodies you are registered with.  
.....  
.....  
.....

6. Does your organization have any environmental certification?  
Yes [ ] No [ ]

If yes, kindly state which certification your organization possesses?  
.....  
.....  
.....

## Section II: GSCM adoption.

Kindly indicate the extent to which your firm has adopted the following GSCM practices.

[1] No extent at all [2] Small [3] Moderate [4] Large [5] Very large

### 1. Green Procurement.

		1	2	3	4	5
1	The organizations collaborate with suppliers in providing safe and environmentally safe services.					
2	The suppliers to the organization have to show compliance with particular regulations that protect the environment.					
3	The organization sources its products from ISO certified suppliers.					
4	Does the organization purchase packaging made of recyclable materials?					
5	The organization gives feedback to suppliers on supplies that are not environmentally friendly.					
6	The organization discloses to its customers its source of inputs					
7	The organization carries tests on its inputs to ensure they are environmentally safe.					
8	The organization keeps records of all its purchases to ensure accountability and easy tracking of all its inputs.					

## 2. Reverse Logistics

		1	2	3	4	5
1	The organization has invested in activities that ensure any waste after delivery is returned for recycling and reuse.					
2	The organization consumes internally. They consume waste and scrap internally.					
3	The organization creates market for waste products it cannot consume internally.					
4	The organization has a waste policy as to waste sorting, increased use of recycled materials, and reducing waste amounts					
5	The organization shares its environmental management techniques with other firms in the industry					
6	The organization has a collection point for goods meant for recycling.					
7	The organization caters fully for reverse logistics costs- No customer charges					
8	There is departmental collaboration, communication and cooperation in reverse logistics.					
9	The Organization provides its customers with information and training regarding reverse logistics					
10	The organization manages the risks associated with reverse logistics					

### 3. Green Logistics.

		1	2	3	4	5
1	The organization has invested in activities that ensure products are delivered using a green distribution system.					
2	The organization engages in energy conservation, fuel recovery and uses energy efficient equipment.					
3	The organization has included GSCM in its strategic planning process and gets commitment from senior managers.					
4	The organization engages in information gathering and tracking to assess their GSCM performance.					
5	The organization engages in designing eco-efficient routes and environmental risk analysis before dispatching products for transport.					
6	The organization has a transport policy that ensures equipments producing harmful emissions are serviced or written off.					
7	The organization complies with the environmental demands of the local authority.					
8	The organization adopts new technology that promotes green distribution.					
9	The organization trains its employees on Green Distribution practices					

**Section III – Respondents perception of organization competitiveness.**

Kindly indicate the extent to which your firm indicates competitiveness.

[1] No extent at all [2] Small [3] Moderate [4] Large [5] Very large

	<b>Competitiveness</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>1</b>	Adoption of Green supply chain management procedures					
<b>2</b>	Operational performance					
<b>3</b>	Profitability					
<b>4</b>	Cost reduction					
<b>5</b>	Increase in Customer base					
<b>6</b>	Corporate Image					
<b>7</b>	Increase in Market Share					
<b>8</b>	Increase in Customer loyalty					
<b>9</b>	Increase in share value / dividend payment					
<b>10</b>	Implementation of Government regulations					

### **Appendix 3: Logistics Firms in Mombasa registered by Kenha**

- 1 WESTEND ENTERPRISES LTD
- 2 PRESSURE POINT SYSTEMS LTD
- 3 WATTEAH TECHNOLOGIES LTD
- 4 NORTH RIFT FARMERS LTD
- 5 KSD LOGISTICS LTD
- 6 POINTVON SOLUTIONS LTD
- 7 EPZ TRANSPORTERS LTD
- 8 RIFF MAX COMPANY LTD
- 9 AMAXDY (EA) COMPANY LTD
- 10 ASG TRANSPORTERS LTD
- 11 LIGHTERZ TRANSPORT LTD
- 12 KINGORANI LOGISTICS LTD
- 13 WAT ENERGY LTD
- 14 CREAMI TRANSPORTERS LTD
- 15 LABSAN TRANSPORTERS LTD
- 16 ALINSON COMPANY LTD
- 17 JL & SONS LTD
- 18 ALINTON SUPPLY COMPANY LTD
- 19 UNILOPEE TRANSPORTERS LTD
- 20 SALIM & SONS LTD
- 21 ELTOY LOGISTICS LTD
- 22 HIGHWAY CARRIERS LTD
- 23 CLEANTECH ENTERPRISES LTD
- 24 FRANATO ENTERPRISES LTD
- 25 ELMI TRANSPORTERS COMPANY LTD
- 26 TURBO LOGISTICS MSA LTD
- 27 KASSAM HAULIERS COMPANY LTD
- 28 DAHAM TRANSPORTERS LTD
- 29 KAY LOGISTICS LTD

- 30 HABO AGENCIES LTD
- 31 EXPRESS KENYA LTD
- 32 A TO Z TRANSPORTERS LTD
- 33 STARLIGHT LOGISTICS LTD
- 34 ALNASOOR & SONS LTD
- 35 ALIBHAI TRANSPORT LTD
- 36 WESTWING CONSULTANTS LTD
- 37 BURHANI LOGISTICS LTD
- 38 REGEANT LOGISTICS & SOLUTIONS LTD