

**GREEN SUPPLY CHAIN MANAGEMENT PRACTICES AND SUPPLY
CHAIN PERFORMANCE IN MOBILE PHONE FIRMS IN KENYA**

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DECLARATION

I declare that this research project is my original work and has never been submitted to any other University for assessment or award of a degree.

Signature..... Date.....

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D61/67571/2011

This project has been submitted with my authority as the university supervisor.

Signature..... Date.....

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DEDICATION

To my family, for your love and support.

ACKNOWLEDGEMENTS

The pursuit of knowledge is a humbling experience; it makes one realize just how much she/he doesn't know.

My sincere gratitude goes to the University of Nairobi for granting me the opportunity to pursue my post graduate degree. I appreciate the efforts of my supervisors Dr Iraki and Mr Chirchir for bringing out the best in me. I wish to acknowledge my parents for their moral support and continued encouragement. The list is too long to permit individual mention and so I give gratitude to everyone who played a role directly or indirectly to enable my successful completion of my MBA. Indeed "It takes a village to raise a child" and the greater challenge of giving back to the society lies ahead. May the almighty God enable me transform the great ideas I have attained into a reality.

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LIST OF ABBREVIATIONS

| | |
|------|--|
| GSCM | -Green Supply Chain Management |
| CCK | - Communications Commission of |
| SCOR | -Supply Chain Operations Reference |
| NEMA | -National Environment Management Authority |
| BSC | -Balance Scorecard |

ABSTRACT

This study is about the relationship between green management practices and supply chain performance in mobile phone firms in Kenya. The study had three objectives to achieve: To determine the green supply chain practices adopted by four mobile telecommunications companies in Kenya, To determine the key drivers in the implementation of green supply chain management practices in the mobile phone firms in Kenya and to determine the relationship between green supply chain management and supply chain performance

The research design was a descriptive study. Data was collected using a questionnaire that was administered through drop and pick later method. Percentages and frequencies were used to analyze objective one and two whereas regression analysis and correlation was used to analyze the relationship between green supply chain practices and supply chain performance. The major findings were: that there was a significant relationship between green management practices and supply chain performance represented by R^2 value of 0.737 which translates to 79.4% variance explained by the five independent variables of green management practices improves supply chain performance.

The study found that Green supply chain management practices are significant in enhancing the performance of supply chains. The study recommends that mobile phones companies should ensure proper utilization of materials by customers. The companies should also find appropriate business processes needed in implementing green supply chain management practices. The mobile phones firms should practice waste reduction, reuse and recycling approaches in order to enhance effectiveness in the supply chain.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Over the past decade green supply chain management has emerged as an important component of the environment and supply chain strategies for a number of companies and they have been aiming at integrating environmental concerns in their business operations and in interactions with their stakeholders in embracing environmental sustainability into business strategies (Dyllick and Hockerts, 2002) Rao and Holt (2005) pointed out that organizations adopting green supply chain management in the South East Asian region ultimately enhanced both competitiveness and economic performance.

Green supply chain management is an approach used to design and or redesign the supply chain (SC) to incorporate practices that minimize the impact if a firms' activities on the environment not only from start to finish of a supply chain but also from the beginning to the end of a product's life cycle for the purposes of improving the long term performance of the individual companies and the supply chain (Green et al, 2008). A green supply chain may involve use of environmentally friendly inputs and transforming them into products that can improve or be recycled within the existing environment.

Green supply chain management entails a decision making process with several processes. The initial process is identification of the environmental costs within the process, determination of opportunities yielding cost savings and reduction of environmental impact, calculation of benefits of the proposed alternatives and finally implementation and monitoring of the improvement solutions (Patrick et al, 2007)

Green supply chain management endeavors in the optimization of the supply chain for economic performance, environmental and social benefit with high resource efficiency. It requires close cooperation between sections inside the company and the enterprises thus integrating environmental management into the supply chain harmoniously.

Green supply chain management is driven by the need for environmental protection and conservation of natural resources has become an absolute necessity at national and international levels. Management of hazardous waste is an important part in attaining environmental protection throughout the world. Minimization of hazardous waste generation, waste recovery for valuable products and prevention of environmental degradation requires utmost attention for a firm to operate optimally (Kannan et al, 2010).

The results of the research carried by Purba et al (2005) demonstrated that greening the inbound function as well as greening production lead to greening outbound, as well to competitiveness and economic performance of the firm. This refers to supply chain management functions which include green purchasing (in-bound logistics) , design for the environment (internal supply chain), green marketing(out-bound logistics) and reverse logistics. Green purchasing is the initial stage of the supply chain. It involves procurement of raw materials that are environmental friendly, substitution of environmentally questionable raw materials and education of the suppliers to have environmental programs like ISO 14001 certification. It helps in reduction of solid liquid wastes, emissions reduction, wastage reduction and consumption of toxic substances.

Green marketing involves all the activities required to deliver the final product to the consumer. It may involve packaging, transportation, location analysis, warehousing and inventory management. The firms have to consider a mode of transport with less carbon print, better packaging methods like recyclable containers, well designed warehouses and improved inventory management skills. Green marketing focuses on the green products like hybrid vehicles and the greening of processes like reducing carbon prints. These practices are geared towards reducing the impact of the product to the environment (Sarkis et al, 2012).

Reverse logistics is the process of retrieving a product from the end consumer back to the firm for the purposes of capturing value or proper disposal (Hock et al, 2000). It is known as 'closing the loop' and the closed loop supply chain. The product being retrieved may be reusable, recyclable or may have remanufacturable characteristics.

The reverse logistics function may feed directly back to the organization's internal supply chain or to an external vendor starting the recycle again.

1.1.1 Green supply Chain Performance

Supply chain performance includes three dimensions: resource, output and flexibility (Beaman 1999). Green supply chain is fairly new concept. It is based on two concepts; the supply chain management concept and the environmental management concept. Green supply chain management is the integration of environmental management into supply chain management. It aims at confining the wastes within the supply chain system in order to conserve energy and prevent the release of dangerous materials into the environment (Muchiri, 2011).

GSCM integrates ecological factors with supply chain management principles to address how an organization's supply chain processes impact the environment. Organizations are increasingly becoming aware of the impact of tight integration of supply chain and environmental management systems in enabling a sustainable business strategy. Many are now seeking out solutions and guidance on how to implement a sustainable supply chain. A sustainable supply chain is a supply chain that is not only optimal for the organization, but is optimal relative to its limited environmental impact (Congizant, 2008).

Efficient resource management is critical to profitability without acceptable outputs, customers will turn to other supply chains and also in an uncertain environment, supply chains must be able to respond to change.(Chege 2012)

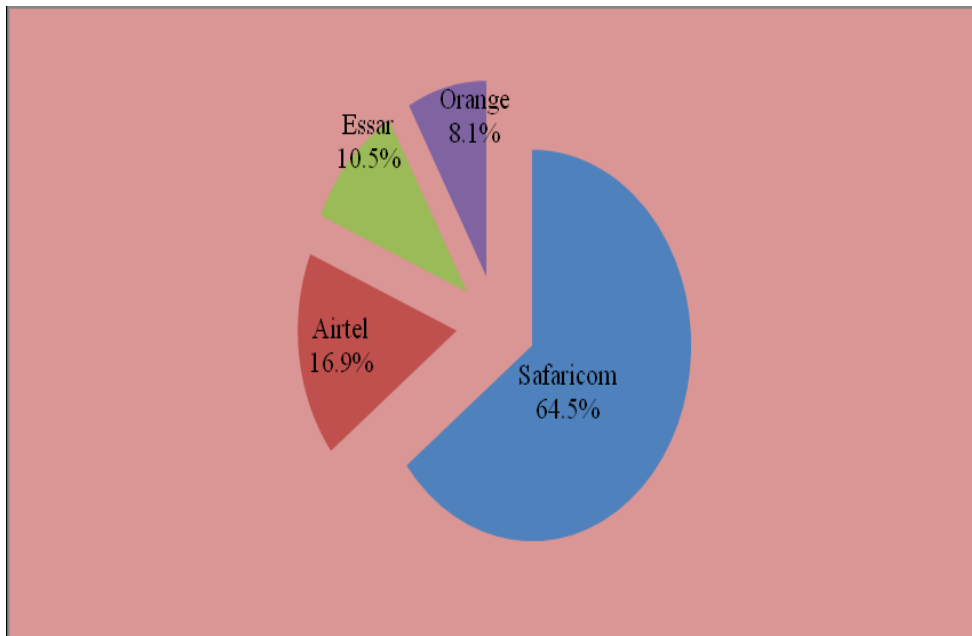
1.1.2 Mobile Phone Firms in Kenya

There are four mobile operators in operation namely: Safaricom Ltd, Airtel Ltd, Essar and Telecom Kenya Ltd (orange). The mobile telecommunications industry in Kenya has exhibited a tremendous growth since its inception. Mobile telephones were first introduced in the Kenyan market in 1992, but the real diffusion of this technology and of affordable services started in 1999, when the communications commission of Kenya (CCK), Safaricom and Airtel Kenya(viously known as

Kencell communications) were licensed to provide mobile services (Luca et al.). Currently we have new players namely: Telecom Kenya Limited (orange) and Essar Telecom Kenya Ltd.

According to CCK quarterly reports 2012, Safaricom controls a market share of 64.5%, Airtel controls 16.9%, Orange controls 8.1% and Essar has 10.5% as shown below:

Percentage subscription market share operator



Source: CCK, Operators' Return (2012)

It would be the responsibility of the telecommunications firms to develop the reverse logistics networks and the flow options in order to avoid the dissatisfaction of the customers, counterfeit phones or laptops, be returned. This would also involve developing credit rules to guide the returns process for the customers and suppliers and creating a framework of metrics for the supplier relationships. Each of these sub-processes are defined by activities such as initiation of a return request, determining the right routing to keep the reverse logistics at a minimal cost, averting counterfeit phones or laptops, crediting consumers and suppliers, thus analyzing the returns and performance of the reverse supply chain (Kumar et al, 2008).

1.2 Statement of the Problem

Green supply chain management as an innovation helps to achieve sustainability by incorporating functions that help to save the natural environment. Various firms have adopted the practice worldwide for benefits accrued with it. Green supply chain management implementation has various drivers promoting it namely; regulation costs markets and company initiatives like corporate social responsibility (CSR) and global warming.

According to study done by Italian researchers on over 4000 manufacturing firms in seven developed countries showed that green supply chain management increases environmental performance. They found that the main motivating factor to green supply chain management adoption was to improve the firm's reputation and improve market image. Green supply chain management can be used as a managerial tool for improving environmental performance. The benefits of green supply chain management may not lead to short term increase in profits but the enhanced reputation and innovation may take time to affect the profits (Testa et al, 2010). Most firms have not adopted it fully due to lack of awareness and lack of knowledge on the green supply chain management concept (Nimawat et al, 2012).

In Kenya Obiso (2011) found that green supply chain management implementation in the petroleum marketing industry was lowly adopted and hence not fully implemented. Most of the companies applied either some of the functions like reverse logistics while others ignored the whole practice. According to Mwirigi (2007) the adoption of green supply chain management by Kenyan manufacturing firms was way below the expectation. Kenya boasts of the most vibrant mobile telecommunications industry in the region that rakes in billions of profits. The players are usually embroiled in price wars and the consumers tend to enjoy the competitive prices. Little concern is given to their impact on the environment and green supply chain management adoption

This study was geared towards the knowledge gap through a study of green supply chain management adoption in Kenya mobile telecommunications firms checking the drivers influencing the breadth and depth of greening in this industry. The research tried to explore the level of adoption of old phones. The topic was also geared towards determining green supply chain management practices, the key drivers and the relationship between GSCM and supply chain performance.

1.3 Objectives of the Study

- (i) To determine the green supply chain practices adopted by four mobile telecommunications companies in Kenya.
- (ii) To determine the key drivers in the implementation of green supply chain management practices in the mobile phone firms in Kenya.
- (iii) To determine the relationship between green supply chain management and supply chain performance

1.4 Value of the Study

Green supply chain management as a practice is now a growing trend worldwide and the various industries have to conform to the laid standards to be acceptable nationally and globally. The findings of this study are beneficial to the mobile telecommunications firms use the findings to improve their operations and enhance competitiveness, also conformance to the growing trends of green supply chain management. The government regulatory bodies National Environmental Management Authority (NEMA) and communications commission of Kenya (CCK) can use the findings during formulation of policies beneficial to the whole industry. The academicians and researchers can use the findings to add knowledge do comparative studies and further research since green supply chain management is a relatively new study. The study will be useful to the organizations to gain understanding of the benefits they accrue through implementation of green supply chain management practice.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The growing concern with the environment, in particular the possibility of climate change through global warming, has led to a focus on how human and economic activity has the potential to adversely impact the long-term sustainability of the planet. Sustainability is defined as meeting the needs of the present without compromising the ability of future generations to meet their own needs. (United Nations Brundtland Commission, 1987)

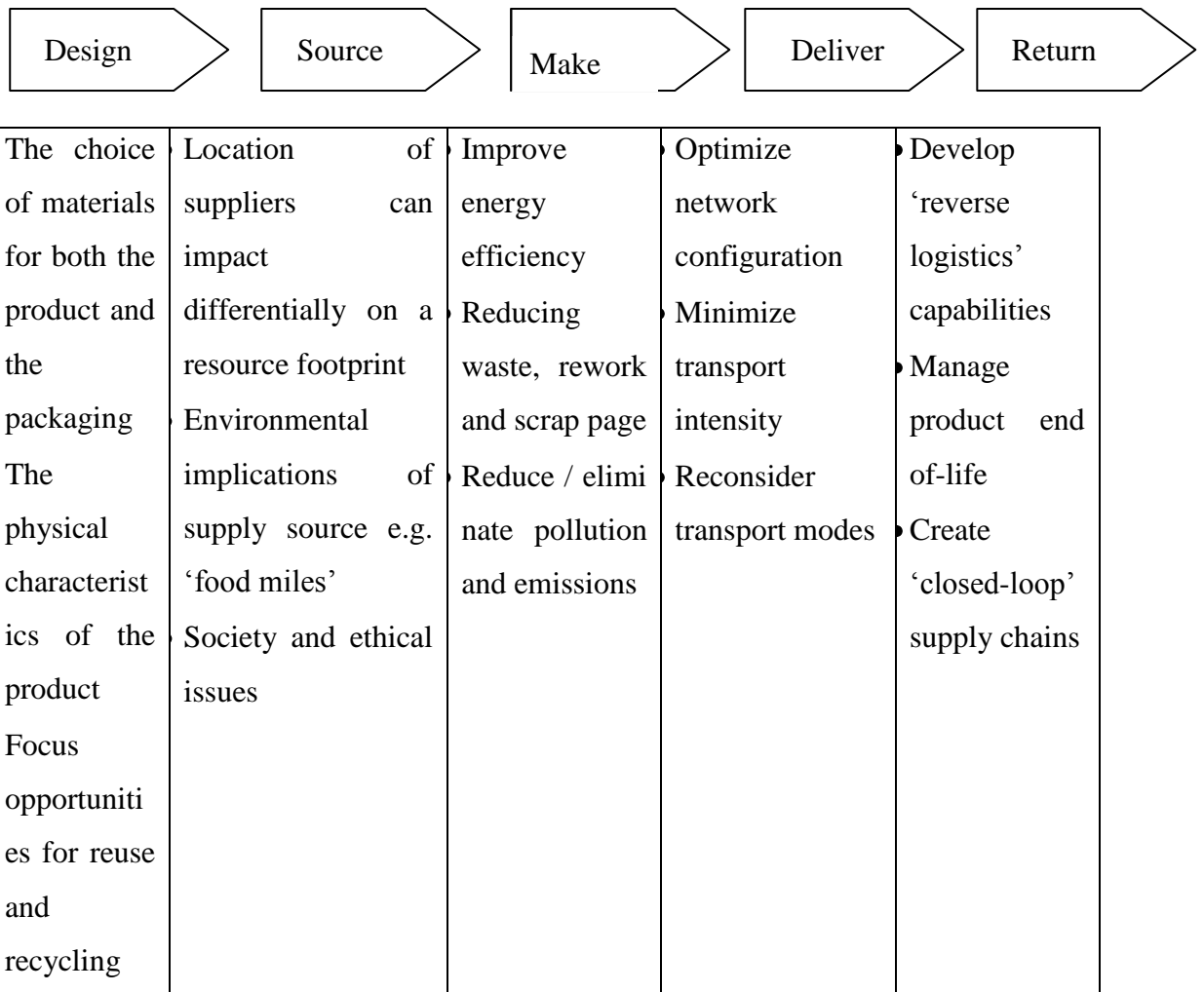
The triple bottom line concept emphasizes the importance of examining the impact of business decisions on three key arenas: Environment (e.g. pollution; climate change; the depletion of scarce resources, etc.) Economy (effect on people's livelihoods and financial security; profitability of the business, etc.)

Society (e.g. poverty reduction, improvement of working and living conditions, etc.)

These three elements – the 3Ps of people, profit and planet – are inevitably intertwined and they serve to remind us that for a business to be truly sustainable, it must pay regard to the wider impact of the activities it undertakes if it seeks to remain viable and profitable. (Martin C, 2011). This study focuses on the environmental aspect of business, hence the greening.

Supply chain strategies that benefit the wider environment are likely to involve the business in less cost in the long term as a result of a better use of resources. For example, one element in a 'green' supply chain might involve utilizing transport capacity more efficiently through better routing and scheduling. In so doing, not only the environmental impact of transport reduced, but also the cost to the company (Elkington 1997).

Supply chain decisions impact the resource footprint



Source; Logistics and supply chain (2002)

Because so many natural resources are being depleted at an increasing rate, it is important that businesses understand these linkages. Some examples of the resource implications of supply chain decisions are described below.

Design; More and more companies are actively seeking to reduce the amount of packaging material that is used, for example, but there can be other, less obvious ways to improve resource sustainability. If those managers responsible for new product development are not aware of the resource implications of their design decisions, this may lead to the launch of products with a bigger than desirable resource footprint.

Telecommunications industry can use recyclable materials in packaging their products.

Source 'Sustainable sourcing' is emerging as a fundamental element of best practice procurement. One reason for this is that it is estimated that for a manufacturer somewhere between 40 and 60 per cent of their total carbon print lies upstream of their operations, whilst for retailers it can be as high as 80 per cent. Depending on where and how those upstream materials and products are sourced and made, there can be major differences in resource consumption. For example the telecommunications industry should be able to manufacture just what is needed.

Make; Manufacturing processes affect the resource footprint primarily through their use of energy, their relative efficiency and the creation and disposal of waste and toxic materials/effluents. In this age of outsourcing and offshore manufacturing it may not always be apparent to the customer what impact manufacturing strategy decisions can have on supply chain sustainability. However, it is evident that there are big differences in the energy efficiency of different factories and also in the waste they generate and how they dispose it. For example the telecommunications industry should be able to make products with less or no emissions in order to conserve the environment.

Deliver ;Clearly decisions on the mode of transport will affect the carbon footprint of a supply chain as will the extent to which transport capacity is efficiently used. A mode of transport with less emission should be used to deliver the products made to where they are required. Return; 'Reverse logistics 'is the term used to describe the process of bringing products back, normally at the end-of-life, but also for recall and repair. In the past little attention was paid to the challenge of reverse logistics, often resulting in extremely high costs being incurred. Clearly products must be designed with their end-of-life in mind, but also the logistics network employed must minimize the use of resources.(Stern, 2009). The mobile telecommunications industry normally advises its customers to return the products that are faulty for replacement or repair.

2.2 Green Supply Chain

Green supply chain management is a new field that tries to complete some of the traditional supply chain weaknesses like environmental efficiency. The green supply chain revolution started in the early 1990's has promoted businesses to become more environmentally conscious (Srivastava et al, 2007). It has gained popularity with both academicians and practitioners and aims at reducing waste and preserving the natural resources. Green supply chain management promotes Eco-efficiency and remanufacturing processes as best practices to the supply chain. (Ashley et al, 1993). Francoise (2010) conducted an analysis of green supply chain management as a marketing tool versus revolution and found that firms trying to become greener gained more visibility, credibility and enhanced their leadership reputation. Other factor like employee loyalty and retention were less significant to going green but a defined sustainability strategy will help in attracting top talent to hire. It can also be viewed as a revolution trying to preserve the ever diminishing environmental resources.

Firms are going green by embracing IT operations to help them reduce corporate energy consumption hence becoming environmentally responsible. Some IT shops are responding by seeking help from professional service providers that assess, plan and implement green initiatives for procurement, operation, and disposal of IT assets and processes. Supply chain achieve performance improvements or resource development though either building specific capabilities over time or by looking to the supply relationships to gain access to new resources (Eisenhardt et al, 1996).

A study exploring the adoption of the green supply chain management practices in the UK firms and found that it was highly influenced by Legislation and internal drivers but least influenced by societal drivers and customers pressure (Diane et al,2009). According to the study conducted by the supply chain and logistics Canada on the Canadian firms, green supply chain management was found to reduce distribution cost by improving distribution efficiency, improved energy reduction, waste reduction and reduced packaging in distribution services. Rha et al, (2010) found that implementation of green supply chain management practices enabled organizations to strengthen sales, profit, on-time delivery and customer service level. However green

supply chain management may not improve supply chain resource performance due to the cost problem, internal management and external management factors.

According to a survey conducted on 87 Mexican companies, (Murugi, 2011) on green supply chain management adoption showed that there is some interest but had a low adoption trend. This was due to the perception that it was not cost effective. This was attributed to the fact that they had poor guidance and leadership on green practices effect on their company strategies.

In China, the firms have increased environmental awareness. This has been promoted by regulatory pressure, competitive pressure, marketing pressure and industry drivers. However this has not been translated into strong green supply chain management practice adoption as expected.

No improvements have been exhibited (Qinhua et al, 2004). However the barriers for this implementation may not be clear, but lack of necessary tools, management skills and knowledge and lack of economic justification in terms of performance. The green supply chain management process can be classified into two categories namely: greening the supply chain and product-based supply. Greening the supply process stands for accommodations made to the firm's supplier management activities for considering environmental perspectives. Product based green supply focuses on changes to the product supplied and attempts to manage by-products of supplied inputs (Arntzen et al, 1995).

2.3 Green Supply Chain Management Practices

Green supply chain management practices can refer to a variety of activities and initiatives implemented by an organization in an attempt to reduce their impact on the natural environment (Awaysheh and Klassen, 2010). The Green supply chain management practices include:

2.3.1 Green Procurement/ Inbound logistics

The “green procurement” can be defined as the process of formally introducing and integrating environmental issues and concerns into the purchasing process, seeking to

acquire goods and services characterized by a low environmental impact that is products environmentally friendly in nature and produced using environmentally friendly processes. The initiatives to minimize environmental impact in inbound supply chain, according to the “green procurement” approach include eco-labeled product purchase, adoption of environmental criteria into the supplier assessment system environmental and collaboration with suppliers (Colicchia et al, 2011).

Beyond requirements that procurement departments have traditionally been promoting over the years, such as the respect of work conditions and non-discrimination, new issues arise about reinforcing environmental requirements towards suppliers. Green Procurement enables better compliance with existing norms, improvement of brand image for consumers and better ranking by non-financial notation organisations. Buyers will preferably choose suppliers with certified processes ISO 14001 for instance, To create a balance in green procurement companies will encourage suppliers who have a low raw material consumption, controlled emissions and pollution levels and raw material tracking. Furthermore they tend to select products made out of a large proportion of recycled and recyclable materials, and stamped by reliable eco-labels (Loebich and Donval, 2011).

2.3.2 Eco-design and Packaging

This is a GSCM practice which requires that manufacturers design products that minimize consumption of materials and energy, that facilitate the reuse, recycle, and recovery of component materials and parts, and that avoid or reduce the use of hazardous products within the manufacturing process. Eco – design and Packaging will include packaging design for reduced environmental impact, packaging re-cycle or re-use and use of biodegradable materials (Green Jr et al, 2012).

According to Jumadi and Zailani (2010) a reduction in the product environmental impact may be achieved not only through an appropriate product design, but also a proper use by consumers. In this sense, consumers must become more aware of the environmental implications related to the products they are using, so that sustainability may be perceived as a value-added element for the society, as well as a distinguishing feature for companies. Two main areas main identified addressing the

available strategies toward s sustainable product design and use, namely product design, and packaging design. As for product design, possible strategies lie in reduction of product environmental impact within the supply chain and reduction of product environmental impact in the consumer use.

2.3.3. Waste Management System

This involves the use of Carbon dioxide refrigeration systems, treatment and control of post combustion emissions, use of alternative fuels (e.g. cleaner fuels), treatment and recycle of hazardous wastes, process optimization implementation of waste-to-energy process, waste reduction, reuse and recycling approaches. Carbon dioxide capture and reduction of hydro fluorocarbons (HFC) and per fluorocarbons (PFC) and the use of carbon dioxide refrigeration systems (Colicchia et al, 2011). Lean production practices and total quality management can lead to improved environmental performances and reduction of wastes and hazardous emissions to human beings and environment e.g. solid and liquid wastes, air emissions and noise (King and Lenox, 2001).

Waste management may also involve source reduction the recycle and re-use waste management programs focuses on management of waste after it has been created. On the other hand Source Reduction focuses on the prevention or the reduction of wastage during production rather than managing it after it has been generated with the aim of efficiently utilizing resources by examining how business is conducted, how materials are used, and what products are purchased. Source reduction can be achieve measure such as; using reusable instead of disposable materials, eliminating certain items, repair and maintenance of equipments, using durable products, using recycled products.(Mugabe 2013)

2.3.4 Internal environmental management

This is the practice of developing green supply chain management as a strategic organizational imperative through commitment and support of the imperative from senior and mid-level managers. General management support is a critical element of adoption and implementation of innovations in an organization, especially

environmental systems. Organizational innovations may remain stuck at the initial idea stage.(Perotti et al., 2012).

Kumar and Chandrakar (2012) notes that top management support can affect new system initiatives success. Cross-functional efforts like GSCM are likely to benefit too. Like most other major environmental efforts, GSCM is a broad-based pervasive organizational endeavor with cross-functional programs. As such, it has the potential to benefit from top management support. It is not just top-level managers from whom support is needed; support from mid-level managers is also important to successful implementation of environmental practices. Support from middle-management levels is important because environmental management is related to almost all departments in an organization, and cross-departmental cooperation is important to successful practices. Strong communication between business managers and environmental professionals with management support is also necessary for effective management of both business and environmental issues.

2.3.5 Reverse Logistics

It is the process of planning, implementing and controlling the efficient, cost-effective flow of raw materials, in process inventory, finished goods and related information from the point of consumption to the point of origin for the purpose of recapturing or creating value or for proper disposal. 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 (Xie and Breen, 2012).

2.3 Drivers of Green Supply Chain Management

Green supply chain management has been adopted by many companies to enhance their performance and preserve the environment. The companies have to achieve a balance in their operations to ensure sustainability. There are various drivers and pressures propelling the Green Supply chain management practice in the industry.

Government regulation is the most influential driver of Green supply chain management. The government provides legislation by passing laws and regulations on standards of practice. It also enforces the regulations to ensure compliance. In Kenya

two agencies are delegated with this task are; National Environmental Management Authority (NEMA) .It also promotes use of Environmental Management Systems (EMS) like the ISO 14000series. The government may offer incentives to encourage adoption of green supply chain management, this may be through financial incentives, education, pilot projects and tax breaks (Scupolaetal, 2003). The market and competitors influence the green initiative; customer defines the market of the products. The customer demand for a green product is a key driver in green supply chain management. According to Zhu and Sarkis (2006) the environmental properties of the products and services must meet customer requirements.

Corporate Social Responsibility of a company determines its approach towards the green supply chain management practices. It refers to the obligations of a firm to society and its stakeholders (Smith et al, 2003). It is an important driver to environmental management. The firms may have a policy towards environmental protection. The policy may promote activities like tree planting, reclamation of natural resources and waste management. The CSR activities are sponsored in the firm's budget. Firms with relevant CSR programs may win the customers leading to better performance.

Cost implications of implementing the green supply chain management practices affect the adoption. The firms may have to optimize the costs associated with the implementation of green supply chain management practices versus their profitability for them to adopt it. If the green supply chain management implementation cost is too high less firms will adopt, hence implementation has to be sustainable.

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The implementation of Green Supply Chain Management practices can be hindered by various factors like lack of government support, Lee (2008) found out the government can boost awareness by involvement through funding, taxation policy and business training to promote the green supply chain initiative. Failure to take part can be a barrier in green supply chain development. Cramer (2002) found out other barriers to the adoption of GSCM strategy as: lack of information regarding environmental benefit led to fewer firms adopting green initiative, lack of

management support, high investment cost, existence of other techniques, lack of information about green supply chain best practices, few software tools for enabling end-to-end optimization of supply chain along with environment management and global sourcing makes tracing of carbon footprint difficult. Walker et al, (2008) categorized them as external barriers including regulation, poor supplier commitment and industry specific barriers, whereas the internal barriers are cost and lack of legitimacy.

2.4 Green Supply Chain Management and Supply Chain Performance

Performance refers to the evaluation of supply chain management, and includes both tangible for example cost and intangible for example capacity utilization factors (Chang, Tsai and Che- Hsu, 2013). Organizational Performance can be done through Balance score card (BSC). According to (Halme, 2010) the balance score card has four main areas of measurement. The four areas are; the Customer perspective which evaluates on how the company adds value for the customers. The customer estimates the value through time, quality, performance, service and cost. In BSC the company has to set goals for these value adding elements and translate these into specific measures. Customer based measures have to be translated into a measures of what the company have to do internally to meet its customers' expectations. Customer value derives from processes, decisions and actions in the organization. The second area is the internal business perspective focuses on these elements. The third are is financial perspective which measures financial success. Goals in this area are deals typically with profitability, growth, and shareholder value. Finally, innovation and learning perspective evaluates on how the company can continue to improve and create the value in the future.

Another well-known approach for the SC measurement is Supply chain operations reference (SCOR), which is used in various industries around the world. The Supply-Chain Council, which is a global organization of firms interested in SCM, introduced the SCOR model in 1996. The SCOR model is a business process reference model. It provides a framework that includes supply chain business processes, performance metrics, best practices, and people features. In the SCOR model the metrics are linked with five management processes: plan, source, make, deliver, and return. The SCOR

model contains hundreds of performance metrics that are divided under five core supply chain performance attributes namely; Reliability which involves achievement of customer demand fulfillment on-time, complete, without damage etc.

Responsiveness entails the time it takes to react to and fulfill customer demand. Agility involves the ability of supply chain to increase or decrease demand within a given planned period. Cost is objective assessment of all components of supply chain cost and Assets involves the assessment of all resources used to fulfill customer demand (Supply-Chain Council, 2010).

Green supply chain management helps in the reduction of waste and emission to the environment. However, the benefits are not limited only less toxic consuming or less waste. The green supply chain management principle can be applied to all departments in the organization. Duber-Smith (2005) identified ten reasons why the company should adopt green supply chain management practices: target marketing, sustainability of resources, lowered costs/increase efficiency, product differentiation and competitive advantage, competitive and supply chain pressures, adapting to regulation and reducing risk, brand reputation, return on investment, employee morale, and the ethical imperative. Stevels (2002) demonstrated the benefits of green supply chain management to different roles of supply chain including environment and society in terms of different categories: material, immaterial, and emotion. For material, GSCM helps lower environmental load for environment, lower cost prices for supplier, lower cost for producer, lower cost for ownership for customer, and less consumption of resources for society. In terms of immaterial, GSCM helps overcome prejudice and cynicism for environment, less rejects for supplier, easier to manufacture for producer, convenience and fun for customer, and better compliance for society. For emotion, GSCM helps motivation of stakeholder for environment, better image for supplier and producer, feel good and quality of life for customer, and make industry on the right track for society.

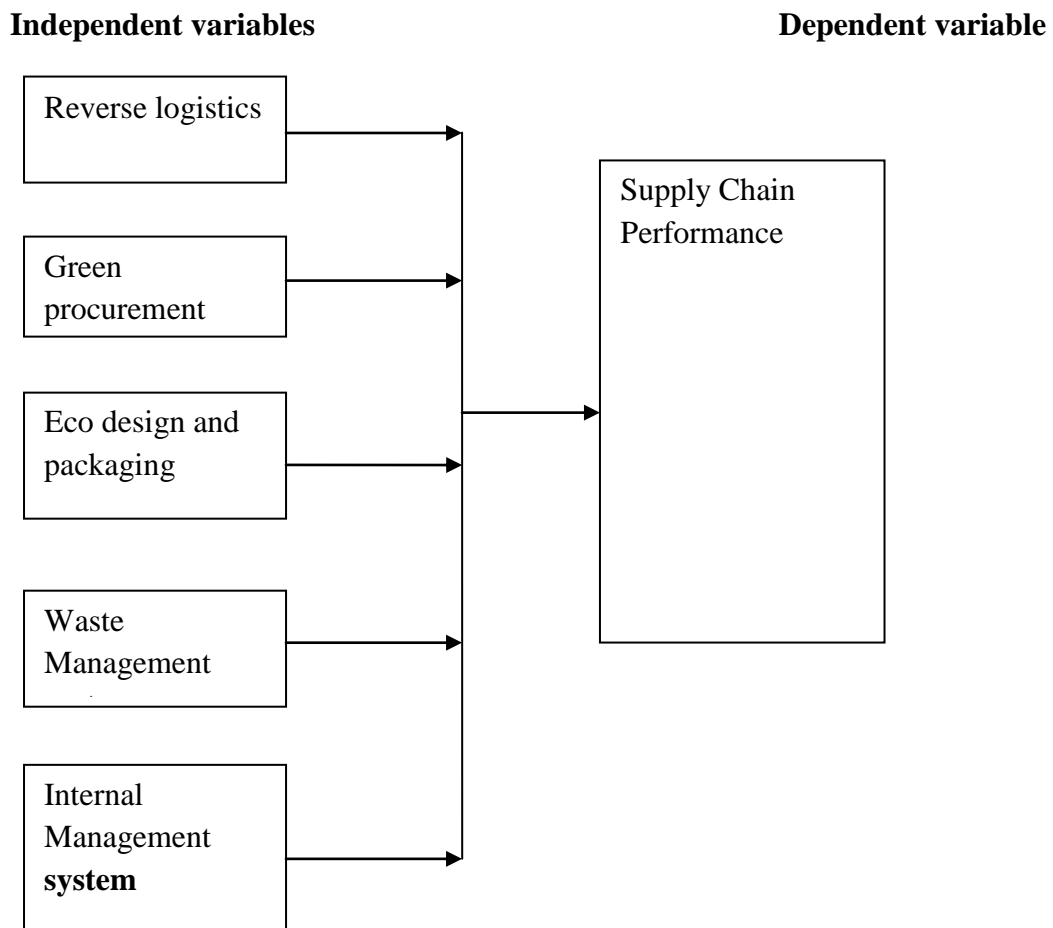
2.5 Summary of Literature

Green supply chain practices have been explained in detail in literature as well as studies done in the area. It has shown that lack of comprehensive framework on the GSCM practices and as a result different organizations have adopted different

practices that they deem possible to their business context. As such there is lack of universally acceptable GSCM practices available. The literature pointed out the benefits accrued from adoption of GSCM practices: Chege (2012) did a study on the GSCM practices and SC performance but the study focuses on private hospitals only and recommended further research on the same on other practices and different firms.

2.6 Conceptual Model

Conceptual Framework links GSCM practices and supply chain performance.



Source (Author 2014)

Application of GSCM practices is expected to have an impact on supply chain performance. Localized sourcing will lead to reduced short procurement distance and inventory costs. Reverse logistics will reduce space and time; this is expected to have an impact in reliability and responsiveness. Waste management solutions will reduce solid wastes and as such affect Supply Chain Management costs. Green procurement will lead to timely delivery of materials, products and improved service to customers.

CHAPTER THREE. RESEARCH METHODOLOGY

3.1 Introduction

This chapter explains the methods and tools used in data presentation and analysis. Research methodology is a way to systematically solve the research problem. The information obtained helps to justify the relevance of the topic studied.

3.2 Research Design

A descriptive type of research design was conducted to collect the information about the implementation of green supply chain management in the three companies of interest. A descriptive research are those studies which are concerned with describing the characteristics of a particular individual or a group studies concerned with specific predictions with narration of facts and characteristics concerning individual group or situation are all examples of descriptive research studies(.Ngugi 2012) Descriptive research assists the researcher to collect data from a population by way of observation, description, recording, analyzing and reporting the conditions operating at the moment.

A census survey was conducted for data collection. It can be presumed that in such an inquiry, when all items are covered, no element of chance is left and highest accuracy is obtained. Besides this type of survey involves a great deal of time, money and energy. Therefore when the field of inquiry is large, this method becomes difficult to adopt because of resources involved.

3.3 Population

The population of interest for the study was four mobile phone firms in Kenya, Safaricom Limited, Airtel and Telecom Kenya Limited (Orange Telecom) The research was carried out in the procurement department of the companies

| | |
|-----------------------------------|----|
| Procurement Manager | 4 |
| Users | 5 |
| Procurement Staff | 4 |
| Agents | 10 |
| Suppliers to Safaricom and others | 10 |
| Newly licensed | 10 |
| Total | 43 |

Source; Research Data (2014)

3.4 Data collection

To determine the green supply chain management practice in the companies, the drivers and barriers encountered in its implementation. Questionnaires were employed to collect data. The questionnaires were divided into four parts according to the objectives under investigation in the study.

The first part encompassed the general information of the respondent, second part was to help identify the green supply chain practices implemented in the company, the third part investigates the drivers of green supply chain management and the fourth the effect of green supply chain on the firm's performance. A likert type of scale will be employed having different guidelines for different sections because it is used to rank. A pilot test of the questionnaire was conducted to identify any ambiguous questions. . The respondents included the top management, staff in the procurement department and users of the mobile p hones. The questionnaires were administered through drop and pick method

3.5 Data Analysis

Descriptive statistics were used to analyze objective one and two by applying measures of central tendencies of mean, mode, median and standard deviation.

Objective three was analyzed using regression analysis and correlation with green supply chain management practices as the independent variables and supply chain performance as the dependent variable.

The researcher utilized the Statistical package for social sciences (SPSS) software. The following regression equation was used. $S = a + b_1 x_1 + b_2 x_2 + b_3 x_3 + b_4 x_4 + b_5 x_5 + e$. Where: S= Supply chain performance; a= the S intercept, $b_1, b_2, b_3, b_4,$ and b_5 are regression weights attached to the variables; e is the error term; x_1 = Reverse Logistics; x_2 = Green Procurement/ Inbound logistics; x_3 = Waste Management Systems; x_4 = Eco-design and Packaging and x_5 = Internal environmental management.

CHAPTER FOUR :DATA ANASLYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This chapter discusses the interpretation and presentation of the findings. The purpose of the study was to investigate the green supply chain management practices and supply chain performance in Mobile phones firms in Kenya. The finding was intended on answering the study's research questions. Data composed was collated and reports were produced in form of tables and qualitative analysis done in prose.

4.2 Response rate

The study targeted 43 respondents. Out of 43 , 36 respondents completely filled in and returned the questionnaires; this represented an 84% response rate. This is a reliable response rate for data analysis as Mugenda and Mugenda (2003) pointed that for generalization a response rate of 50% is adequate for analysis and reporting, 60% is good and a response rate of 70% and over is excellent.

Table 4.1 Response rate

| Response rate | | |
|--------------------------------------|-----------|------------|
| Response Rate | Frequency | Percentage |
| Procurement Manager | 3 | 7 |
| Users | 4 | 9 |
| Procurement Staff | 3 | 7 |
| Agents | 8 | 19 |
| Suppliers to safaricom and Others | 9 | 21 |
| Newly Licensed | | |
| Total | 36 | 84 |

Source; Research Data (2014)

From the data collected, 3 (7%) of the procurement managers responded, 4 (9%) of users responded, 3 (7%) of the procurement staff responded, 8 (19%) of the agents responded, 9 (21%) of the suppliers and other newly licensed responded to the questionnaires. This group was considered adequate for the purpose of providing information.

4.3 Demographic Characteristics of the respondents

The study found it crucial to ascertain the said information since it configured the charitable trust under which the study can fairly entrance the applicable information. The analysis relied on this information of the respondents so as to categorize the different results according to their acquaintance and responses.

4.3.1 Duration of Operation of the Company

The study sought to establish the duration of operation of the company, from the response majority of the respondents reported that their respective companies has been in operation for more than ten years, others of the respondents confirmed that their companies have been in operation for a between five to nine years while a few of the respondents notes that their respective companies has been in operation for a period between eleven to fifteen years.

Table 4.2: Duration companies have operated

| | Frequency | Percent |
|--------------------|-----------|---------|
| under 5 | 12 | 35.3 |
| 6-10 years | 16 | 47.1 |
| Valid 11- 15 years | 2 | 5.9 |
| over 16 years | 6 | 11.8 |
| Total | 36 | 100.0 |

Source; Research Data(2014)

Most of the firms are younger than 16 years and this reflects the fact that mobile industry is very young. The first service provider (Safaricom/Kencell) were licenced in 1997.

4.3.2 Duration of service with the company

The study sought to ascertain from the respondents on the duration of service with the company, from the findings gathered from the interviewees, majority of them have worked with the company for a period between three to five years, other respondents reported to have worked with the company for a period between six to eight years while a few of the respondents reported having worked with the company for a period between nine and twelve years.

Table 4.3: Duration of service with the company

| | Frequency | Percent |
|-------------------|-----------|---------|
| less than 2 years | 4 | 11.11 |
| 2- 5 years | 20 | 55.56 |
| 6-10 years | 8 | 22.22 |
| Above 10 years | 4 | 11.11 |
| Total | 36 | 100.0 |

Source; Research Data (2014)

The duration reflect the young age of the industry as noted in table 4.2

4.3.3 Duration that the Company has established Green supply Chain Management

The study sought to establish from the respondents on the duration that the company has established the green Chain Management, the data collected was presented in the table 4.2;

Table 4.4 Duration of company with GSCM

| Duration | Frequency | Percentage |
|--------------------------|------------------|-------------------|
| Considering it currently | 4 | 11 |
| 1year | 7 | 19 |
| 2 years | 9 | 25 |
| 3years | 12 | 33 |
| More than 4 years | 4 | 11 |
| TOTAL | 36 | 100 |

Source; Research Data (2014)

The duration of companies with GSCM indicates that the companies are young.

From the data collected the findings revealed that majority 12 (33%) of the respondents reported that their respective company has established green supply chain management for a period of three years, 9 (25%) of the respondents reported that their respective companies have established green supply chain ,management for a period of two years,7 (19%) of the respondents reported that their respective company has established the green supply chain for a period of one year, while 4 (11%) of the respondents considered it currently. The finding therefore implies that most of the companies have implemented the green supply chain for a period of three years as depicted by the findings and reverse logistics is the most implemented.

4.4 Green supply Chain Management Practices

Objective on of the study sought to establish the green Supply chain practices, the items enquired under this objective were presented below;

4.4.1 Reverse Logistics

The study sought to ascertain some aspects of the reverse logistics, the data collected from the respondents were therefore presented in table 4.3;

Table 4.5 Aspects of the reverse Logistics

| Aspects of the reverse logistics | Mean | STDev |
|--|-------------|--------------|
| Materials reuse whenever possible | 4.090 | 0.094 |
| The telecommunication company manages reverse flow of material | 3.981 | 0.987 |
| The telecommunication company control environmental risk associated with supplier operations | 3.432 | 1.904 |
| The telecommunication company manages environmental packaging and distribution. | 3.123 | 1.980 |
| Assuring proper utilization of material by customers | 2.830 | 0.786 |

Source; Research Data (2014)

The low score for assuring proper utilization of materials by customers is because the firms have no control on the customers.

From the data collected, majority of the respondents contend to large extent that there is Materials reuse whenever possible by the companies as this was shown by a mean score of 4.09, other respondents reported that telecommunication company manages reverse flow of material to a large extent, as this was depicted by a mean score of 3.98, others agreed that The telecommunication company control environmental risk associated with supplier operations to a moderate extent as was shown by a mean score of 3.43.also The telecommunication company manages environmental packaging and distribution to a moderate extent as was shown by a mean score of 3.12, also companies assure proper utilization of material by customers to a moderate extent as was shown by a mean score of 2.83.

By implication under the reverse logistics the telecommunication company manages reverse flow of material; control environmental risks associated with supplier operations, assure proper utilization of material by customers, manages environmental packaging and distribution and ensures material reuse whenever possible.

4.4.2 Green Procurement/Inbound Logistics

The study sought to ascertain some aspects of green procurement/inbound logistics, the data collected were presented in table 4.4;

Table 4.4 Green Procurement Inbound logistics

| Aspects of green procurement/inbound logistics | Mean | STDev |
|---|-------|-------|
| Adoption of environmental criteria into the supplier assessment systems | 4.909 | 0.089 |
| Eco-labeled product purchase | 3.903 | 1.098 |
| Environmental collaboration with suppliers | 2.98 | 1.987 |
| Suppliers' requirement to have an environmental certification | 2.786 | 1.986 |

Source; Research Data (2014)

The low score on suppliers is because the firms have no control on their suppliers.

From the data collected majority of the respondents' reports that Telecommunication Company adopts the environmental criteria into the supplier assessment systems to a very large extent this was shown by a mean score of 4.09. other respondents reported that telecommunication company implements the Eco-labeled product purchase to a large extent as was shown by a mean score of 3.90, others reported that telecommunication company implements environment collaboration with the suppliers to a moderate extent as shown by a mean score of 2.98, while a few of the respondents reported that suppliers requirement of having an environmental certification has been implemented to a moderate extent as this was shown by a mean score of 2.78.

By implication telecommunication company has implemented the eco-label product purchase, Adopted environmental criteria into the supplier assessment systems, Environmental collaboration with suppliers and implemented the suppliers' requirement to have an environmental certification.

4.4.3 Eco-Design and Packaging

Further the study sought to ascertain some aspects of Eco-design and Packaging the data collected were represented in the table 4.5;

Table 4.5 Eco-design and Packaging

| Aspects of eco-design and packaging | Mean | STDev |
|---|-------------|--------------|
| Use of biodegradable materials | 4.001 | 1.987 |
| Reduction of product impact within the supply chain | 3.897 | 1.8965 |
| Reduction of packaging impact | 3.896 | 0.0982 |
| Reduction of product impact in the consumer use | 2.908 | 1.9098 |

Source; Research Data (2014)

The low score on reduction of product impact in the consumer use is because firms have no control on their customers.

From the data collected majority of the respondents reported that telecommunication company has implemented the Use of biodegradable materials to a large extent this was shown by a mean score of 4.001, other respondents reported that the company has implement reduction of the product impact within the supply chain to a large a large extent as was shown by a mean score of 3.87 consequently on the same scale others reported that the company has implemented the reduction of packaging impact as was shown by a mean score of 3.89. Others reported that reduction of the product impact in the consumer use has been implemented to a moderate extent as this was shown by a mean score of 2.908.

By implication on the aspect of eco-design and packaging the company has implemented the use of biodegradable materials, reduction of packaging impact, reduction of product impact in the consumer use and the reduction of product impact within the supply chain.

4.4.4 Aspects of Waste Management Systems

Further the study sought to establish aspects of the waste management systems, the data collected was presented in the table 4.6;

Table 4.6 Waste management Systems

| Aspects of waste management systems | Mean | STDev |
|---|-------------|--------------|
| Implementation of waste-to-energy process | 3.902 | 1.024 |
| Use of alternative fuels e.g. cleaner fuels | 3.675 | 1.907 |
| Reduction of hydro fluorocarbons(HFC) and per fluorocarbons (PFC) | 3.342 | 1.876 |
| Waste reduction, reuse and recycling approaches | 2.876 | 1.904 |

Source; Research Data (2014)

From the data collected majority of the respondents reported that the company has implemented the waste-to –energy to a large extent as was shown by a mean score of 3.902, others reported that the company has implemented the use of alternative fuels e.g. cleaner fuels to a large extent as was shown by a mean score of 3.67, also others reported the company has implemented the reduction of hydro fluorocarbons (HFC) and per fluorocarbons (PFC) to a moderate extent as was shown by a mean score of 3.34, while a few of the respondents reported that their respective companies have implemented waste reduction, reuse and recycling approaches to a moderate extent as this was shown by a mean score of 2.87.

By implication the company has enhanced implementation of the waste reduction, reuse and recycling approaches, use of alternative fuels e.g. cleaner fuels, Reduction of hydro fluorocarbons(HFC) and per fluorocarbons (PFC) and the implementation of waste-to-energy process.

The low value for waste reduction, reuse and recycling is because there is no law on how old phones are disposed.

4.4.5 Aspects of internal Environment Management

Further the study sought to establish some aspects of internal environment management, the data collected were presented in the table 4.7;

Table 4.7 Internal environment Management

| Aspects of internal environment Management | Mean | STDev |
|---|-------------|--------------|
| Eco-labeling of Products | 4.098 | 1.098 |
| Commitment of GSCM from senior managers | 3.879 | 1.097 |
| Support of regulations environment | 3.754 | 0.673 |
| Support for GSCM from mid-level managers | 2.987 | 0.674 |

Source; Research Data (2014)

The low value for support from mid-level managers is because they really do not have a say on what goes on in the firms.

From the data collected majority of the respondents reported that eco-labeling of the products has been implemented by the respective company to a very large extent, this was shown by a mean score of 4.098, other respondents reported that commitment of GSCM from the senior managers has been enhanced to a large extent this was shown by a mean score of 3.87, concurrently others reported that support of the regulations environment has been implemented to a large extent as was shown by a mean score of 3.75, while others contend that support for GSCM from the mid-level managers has been enhanced to a moderate extent as was shown by a mean score of 2.98.

By implication, on the aspects of internal environment management, the following approaches has been implemented to some extent, Commitment of GSCM from senior managers, Support for GSCM from mid-level managers, Support of regulations environment and Eco-labeling of Products.

4.5 Major Drivers of Green supply Chain Management

Another objective of the study was to establish the major drivers of green supply chain management, the data collected from the respondents on an attempt to fulfill this objective was presented in the table 4.8;

Table 4.8 Major Drivers of Green supply chain Management

| Green Supply Chain Management drivers | Mean | STDev |
|--|-------------|--------------|
| Government | 3.897 | 1.097 |
| Environmental awareness by the customer | 3.897 | 1.653 |
| Company policies towards green supply chain management | 3.312 | 0.543 |
| Global competitiveness | 3.097 | 0.956 |
| Corporate social responsibility | 2.907 | 1.905 |
| Market conditions and competitions | 2.879 | 0.907 |

Source; Research Data (2014)

The high value for the government being a major driver is because the government recognizes the firms that utilize environmental friendly materials and sometimes provide finances for the firms.

From the data collected, majority of the respondents reported Global competitiveness as a green supply chain management driver which contributes to a large extent this was shown by a mean score of 3.09; other respondents reported government as a key driver of the green supply chain management which contributes to a large extent as was shown by a mean score of 3.897, consequently other respondents reported that environmental awareness by customers has been implemented to a large extent as this was shown by a mean score of 3.897. Also others reported that corporate social responsibility has been implemented to a moderate extent as this was shown by a mean score of 2.907 on the same scale other respondents reported that market conditions and competitions has been enhanced to a moderate extent as was shown by a mean score of 2.897.

By implication, the findings revealed the following as the major drivers of the green supply chain management; Government, environmental awareness by the customer, Corporate social responsibility, Market conditions and competitions, Company policies towards green supply chain management and the global competitiveness.

4.6 Effects of Green Supply Chain on Performance

One of the objectives of the study was to establish the effects of green supply chain on performance, under this objective the study sought to establish from the respondents

on the profit before establishing the GSCM and the profit returns after establishing GSCM, from the data collected from the respondents majority of the interviewees contends that the profit realized before the implementation of the GSCM was low as compared to the profit realized after establishing the GSCM, the findings therefore implies that the introduction of the GSCM has improved on the profit considerably.

4.7 Inferential statistics

Objective three of the study was measured using the inferential statistics;

The section below presents coefficient of correlation, coefficient of determination, ANOVA and regression coefficient. Coefficient of correlation shows the relationship between the dependent variable and the independent variables, coefficient of determination shows the contribution of independent variables to the dependent variable, ANOVA tests the significance of the regression model while the regression coefficient shows the effect of unit increase independent variable to the independent variable.

4.7.1 Correlation Coefficient

To compute the correlation (strength) between the study variables and their findings the study used the Karl Pearson's coefficient of correlation (r). The findings as shown in Table 4.9 below revealed that there was a positive correlation between supply chain Management and reverse logistics as shown by a correlation figure of 0.557, even though the correlation is positive, the relationship between supply chain management and reverse logistics is not significant. It was also clear that there was a positive correlation between supply chain management and green procurement/inbound logistics with a correlation figure of 0.512, even though the correlation is positive, the relationship between supply chain management and green procurement is not significant. It was also revealed that there was a positive correlation between supply chain procurement and waste management with a correlation figure of 0.52, likewise even though the correlation is positive; the relationship between supply chain performance and green procurement is not significant. Finally, a positive correlation between supply chain performance and waste management, with a correlation value of 0.538 was realized. Even though the correlation is positive, the relationship between supply chain performance and waste management factors is not significant. This

shows that there was a moderate correlation between academic performance and waste management, reverse logistics, and green-procurement/inbound logistics, waste management and internal environmental management. The lack of significance in the individual relationships could be due to interactive effects with the other variables.

Table 4.9 Coefficient of Correlation

| | | Supplychain Performance | Reverse logistcts | Green procurement | Waste management | Eco-design |
|---------------------------------|---------------------|--------------------------------|--------------------------|--------------------------|-------------------------|-------------------|
| Supply chain performance | Pearson Correlation | 1 | | | | |
| | Sig. (2-tailed) | | | | | |
| Reverse logistics | Pearson Correlation | 0.557 | 1 | | | |
| | Sig. (2-tailed) | 0.3079 | | | | |
| Green Procurement | Pearson Correlation | 0.512 | .320 | 1 | | |
| | Sig. (2-tailed) | 0.1855 | 0.0194 | | | |
| | Pearson Correlation | 0.520 | 0.1846 | 0.1107 | 1 | |
| | Sig. (2-tailed) | 0.0023 | 0.1857 | 0.4300 | | |
| Waste management | Pearson Correlation | 0.538 | 0.0072 | 0.2335 | 0.1027 | 1 |
| | Sig. (2-tailed) | 0.0422 | 0.9591 | 0.0925 | 0.4642 | |
| Eco-design Packaging | Pearson Correlation | 0.538 | 0.0072 | 0.2335 | 0.1027 | |
| | Sig. (2-tailed) | 0.0422 | 0.9591 | 0.0925 | 0.4642 | |

Source; Research Data (2014)

The values above 0.5 in the table clearly indicate that there is a relationship between GSCM drivers and supply chain performance.

4.7.2 Regression Analysis

Objective three was determined by use Coefficient of determination which explains the extent to which changes in the dependent variable can be explained by the change

in the independent variables or the percentage of variation in the dependent variable (supply chain performance) that is explained by all the five independent variables (reverse logistics, green procurement, waste management, eco-design packaging and internal environmental management). From the findings, 54.5 percent supply chain performance is attributed to combination of the five independent factors (reverse logistics, green procurement, waste management, eco-design packaging and internal environmental management) investigated in this study. A further 45.5 percent supply chain performance is attributed to other factors not investigated in this study for example cooperation by the middle level managers. Therefore, there is a need for further research that should be conducted to investigate the other factors (45.5 percent) that contribute to the supply chain performance.

4.7.3 ANOVA

In trying to establish significance of the model the study employed ANOVA. From table 4.3 the significance value is 0.009 which is less than 0.05 thus the model is statistically significance in predicting reverse logistics, green procurement, waste management, eco-design packaging and internal environmental management impact to supply chain performance in mobile companies. The F critical at 5 percent level of significance was 2.70. Since F calculated is greater than the F critical (value = 9.793), this shows that the overall model was significant.

4.7.4 Regression Coefficient

Table 4.11: ANOVA

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|-------|------------|----------------|----|-------------|-------|------|
| 1 | Regression | 12.624 | 4 | 3.156 | 9.793 | .009 |
| | Residual | 30.616 | 95 | .322 | | |
| | Total | 43.240 | 99 | | | |

Source; Research Data (2014)

Table 4.12 Regression Coefficients

| | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|----------------------|-----------------------------|------------|---------------------------|--------|--------|
| | B | Std. Error | Beta | | |
| (Constant) | 1.180 | 0.3303 | | 0.5449 | 0.5881 |
| Reverse logistics | 0.541 | 0.1530 | 0.0498 | 0.3731 | 0.0201 |
| Green procurement | 0.507 | 0.1658 | 0.0170 | 0.1210 | 0.0262 |
| Waste management | 0.518 | 0.1502 | 0.3209 | 2.4461 | 0.0252 |
| Eco-design packaging | 0.528 | 0.1398 | 0.2527 | 1.9406 | 0.0223 |
| Internal env. Managt | 0.507 | 0.1658 | 0.0170 | 0.1210 | 0.0262 |

Source; Research Data (2014):dependent variable=supply chain performance

Table 4.10 Model summary

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------|----------|-------------------|----------------------------|
| 1 | 0.738 | 0.545 | 0.214 | 0.160 |

Source; Research Data (2014)

The significance value of 0.0201 for reverse logistics indicate that reverse logistics as a green supply chain practice greatly influences supply chain performance followed by eco-design packaging with a significance value of 0.0223 and green procurement and internal environmental management with significance values of 0.0262 least influence supply chain performance.

Multiple regression analysis was conducted as to determine the relationship between academic performance and the four variables. As per the SPSS generated table 4.4 the equation

($s = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + \varepsilon$) becomes:

$$Y = 1.180 + 0.0498 X_1 + 0.017 X_2 + 0.3209 X_3 + 0.2527 X_4$$

The regression equation above has established that taking all factors into account (reverse logistics, green procurement, waste management, eco-design packaging and internal environmental management) constant at zero, supply chain performance will be 1.180. The findings presented also shows that taking all other independent variables at zero, a unit increase in reverse logistics will lead to a 0.0498 increase in supply chain performance; a unit increase in green procurement will lead to a 0.017 increase in supply chain performance; a unit increase in waste management will lead

to a 0.3209 increase in supply chain performance and a unit increase in eco-design packaging will lead to a 0.2527 increase in supply chain performance. This means that waste management contribute most to the supply chain performance followed by eco-design packaging then reverse logistics contributed the least to supply chain performance.

The independent variables ;reverse logistics, green procurement, waste management, eco-design packaging and internal environmental management significantly affect supply chain performance.

CHAPTER FIVE :SUMMARY, DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter depicts the summary of the data findings investigate the green supply chain management practices and supply chain performance in the mobile phones firms in Kenya, the conclusions and recommendations are drawn there to. The chapter is therefore structured into summary of findings, conclusions, recommendations and area for further research.

5.2 Summary of the findings

Majority of the respondents reported that their respective companies has been in operation for more than ten years, others of the respondents alluded that their companies have been in operation for a between five to nine years while a few of the respondents notes that their respective companies has been in operation for a period between eleven to fifteen years. majority of them reported having worked with the company for a period between three to five years, other respondents reported to have worked with the company for a period between six to eight years while a few of the respondents reported having worked with the company for a period between nine and twelve years.

Majority12 (33%) of the respondents reported that their respective company has established green supply chain management for a period of three years, 9 (25%) of the respondents reported that their respective companies have established green supply chain, management for a period of two years,7 (19%) of the respondents reported that their respective company has established the green supply chain for a period of one year, while 4 (11%) of the respondents considered it currently.

The objectives of this study were to determine the green supply chain practices adopted by three mobile telecommunications companies in Kenya, to determine the key drivers in the implementation of green supply chain management practices in the mobile phone firms in Kenya and to determine the effects of green supply chain management on the firm's performance.

From the study findings the study noted that under the reverse logistics the telecommunication company manages reverse flow of material; control environmental risks associated with supplier operations, assure proper utilization of material by customers, manages environmental packaging and distribution and ensures material reuse whenever possible. The study revealed that Telecommunication Company has implemented the eco-label product purchase, Adopted environmental criteria into the supplier assessment systems, Environmental collaboration with suppliers and implemented the suppliers' requirement to have an environmental certification.

Further on the aspect of eco-design and packaging the study revealed that company has implemented the use of biodegradable materials, reduction of packaging impact, reduction of product impact in the consumer use and the reduction of product impact within the supply chain. Also the study revealed that the company has enhanced implementation of the waste reduction, reuse and recycling approaches, use of alternative fuels e.g. cleaner fuels, Reduction of hydro fluorocarbons(HFC) and per fluorocarbons (PFC) and the implementation of waste-to-energy process. On the aspects of internal environment the study revealed that the following approaches has been implemented to some extent, Commitment of GSCM from senior managers, Support for GSCM from mid-level managers, Support of regulations environment and Eco-labeling of Products.

On the major drivers of the green supply chain management, the findings revealed the following were the major drivers of the green supply chain management; Government, environmental awareness by the customer, Corporate social responsibility, Market conditions and competitions, Company policies towards green supply chain management and the global competitiveness.

5.3 Conclusions

The study aimed at establishing the green supply chain management practices and supply chain performance in the mobile phones firms in Kenya, therefore from the summary and the discussions the study concludes that reverse logistics the telecommunication company manages reverse flow of material; control environmental risks associated with supplier operations, assure proper utilization of material by

customers, manages environmental packaging and distribution and ensures material reuse whenever possible, the study also concludes that telecommunication company has implemented the eco-label product purchase, Adopted environmental criteria into the supplier assessment systems, Environmental collaboration with suppliers and implemented the suppliers' requirement to have an environmental certification.

Further the study concludes that eco-design and packaging the company has implemented the use of biodegradable materials, reduction of packaging impact, reduction of product impact in the consumer use and the reduction of product impact within the supply chain and that implementation of the waste reduction, reuse and recycling approaches, use of alternative fuels e.g. cleaner fuels, Reduction of hydro fluorocarbons(HFC) and per fluorocarbons (PFC) and the implementation of waste-to-energy process.

The major drivers of GSCM ; reverse logistics, green procurement, waste management, eco-design and internal environmental management affect supply chain performance.

5.4 Recommendations

From the summary of findings and conclusions the studies make the following recommendations; Government regulation being the most influential driver of Green supply chain management. The government should therefore provide legislation by passing laws and regulations on standards of practice. It also should enforce the regulations to ensure compliance. Further the agencies delegated with this task also should promote use of Environmental Management Systems. Further the government should offer incentives to encourage adoption of green supply chain management, this may be through financial incentives, education, pilot projects and tax break. The market and competitors influence the green initiative; therefore customer should define the market of the products since the customer demand for a green product is a key driver in green supply chain management.

5.5 Limitations of the Study

Some of the respondents approached were reluctant to give information and secondly not all green supply chain management practices were studied . The resources available to the researcher were also limited.

5.6 Suggestions for further Research

This study investigated on the role of green supply management practices and supply chain performance in the mobile phones firms in Kenya, The study also suggests that further study be done on the same on organization performance within other sectors other than the telecommunication sectors in order to depict a reliable result that illustrates real situation in the organization.

The study focused on all mobile phones firms in Kenya. Therefore, generalizations cannot adequately be relied on upon based on their nature of ownership and resources they possess. Based on this fact among others, it is therefore recommended that a narrow based study should be done for instance on a single mobile phone firm.


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APPENDICES

APPENDIX: Introduction Letter


UNIVERSITY OF NAIROBI
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MBA PROGRAMME

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DATE...31/07/2014

TO WHOM IT MAY CONCERN

The bearer of this letter ...OMARIBA NYABATE ESMAIL.....

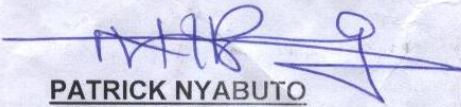
Registration No....D.F.I. 07571/2011.....


is a bona fide continuing student in the Master of Business Administration (MBA) degree program in this University.

He/she is required to submit as part of his/her coursework assessment a research project report on a management problem. We would like the students to do their projects on real problems affecting firms in Kenya. We would, therefore, appreciate your assistance to enable him/her collect data in your organization.

The results of the report will be used solely for academic purposes and a copy of the same will be availed to the interviewed organizations on request.

Thank you.


PATRICK NYABUTO
MBA ADMINISTRATOR
SCHOOL OF BUSINESS



Appendix II: Research Questionnaire

Introduction

This questionnaire has been designed for the sole purpose of collecting data on the Green Supply Chain Management Practices, drivers of green supply chain management and challenges facing the adoption of green supply chain management. The data collected will be treated with a very high degree of confidentiality and it is meant for academic purpose only. A copy of analysis will be sent to you upon request

Section A: General Information

1. How long has your company been in operation?...years
2. How long have you worked in this company? Years....
3. How long has your organization established Green Supply Chain Management?
 - a) Considering it currently ()
 - b) 1 years ()
 - c) 2 years ()
 - d) 3 years ()
 - e) More than 4 years ()

Section B: Extent of Green Supply Chain Management Practices have been implemented in your company

4. Please indicate the extent to which you agree with the following statements on the extent to which your organization has been practicing the following green supply chain practices. The scale below will be applicable:

1= To a very large extent 2= Large extent 3= moderate extent 4= small extent 5=very small extent

| No | Reverse Logistics | 1 | 2 | 3 | 4 | 5 |
|----|---|---|---|---|---|---|
| 1 | The telecommunication company manages reverse flow of material, | | | | | |
| 2 | The telecommunication company control environmental risk associated with supplier operations. | | | | | |
| 3 | Assuring proper utilization of material by customers | | | | | |
| 4 | The telecommunication company manages environmental packaging and distribution. | | | | | |
| 5 | Materials reuse whenever possible | | | | | |

| | Green Procurement/ Inbound logistics | 1 | 2 | 3 | 4 | 5 |
|---|--|----------|----------|----------|----------|----------|
| 1 | Eco-labeled product purchase | | | | | |
| 2 | Adoption of environmental criteria into the supplier assessment System | | | | | |
| 3 | Environmental collaboration with suppliers | | | | | |
| 4 | Suppliers' requirement to have an environmental certification | | | | | |
| | Eco-Design and packaging | 1 | 2 | 3 | 4 | 5 |
| 1 | Reduction of product impact within the supply chain | | | | | |
| 2 | Reduction of product impact in the consumer use | | | | | |
| 3 | Reduction of packaging impact | | | | | |
| 4 | Use of biodegradable materials | | | | | |
| | Waste Management systems | 1 | 2 | 3 | 4 | 5 |
| 1 | Waste reduction, reuse and recycling approaches | | | | | |
| 2 | Use of alternative fuels e.g. cleaner fuels | | | | | |
| 3 | Treatment and control of post combustion emissions | | | | | |
| 4 | Reduction of hydro fluorocarbons(HFC) and per fluorocarbons (PFC) | | | | | |
| 5 | Implementation of waste-to-energy process | | | | | |
| | Internal Environment management | 1 | 2 | 3 | 4 | 5 |
| 1 | Commitment of GSCM from senior managers | | | | | |
| 2 | Support for GSCM from mid-level managers | | | | | |
| 3 | Total quality environmental management | | | | | |
| 4 | Support of regulations environment | | | | | |
| 5 | Eco-labeling of Products | | | | | |

5. Any other? Please indicate

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.....

Section C Major Drivers of green supply chain management 6. Please tick appropriately how you rate the driver that mostly influences the green supply chain management in the company with regards to the parameters listed. . The scale below will be applicable:

1= To a very large extent 2= Large extent 3= moderate extent 4= small extent 5=very small extent

RANK

| No | GREEN SUPPLY CHAIN MANAGEMENT DRIVERS | 1 | 2 | 3 | 4 | 5 |
|----|--|---|---|---|---|---|
| 1 | Government | | | | | |
| 2 | Environmental awareness by the customer | | | | | |
| 3 | Expected business gains | | | | | |
| 4 | Corporate social responsibility | | | | | |
| 5 | Market conditions and competitions | | | | | |
| 6 | Company policies towards green supply chain management | | | | | |
| 7 | Global competitiveness | | | | | |

7. Any other? (Specify)

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.....

SECTION D Indicate how green supply chain management has affected the firm's performance?

| Profit before establishing GSCM | Profit after establishing GSCM |
|--|---------------------------------------|
| | |
| | |
| | |

Thank you for participating