Edith Cowan Peer Reviewed Journals & Books Publishers

Edith Cowan Journal of Procurement & Supply Chain
ISSN:
Vol.1, Issue No.1, pp 20-32.

Green supply chain management practices and supply chain performance. An empirical study of mobile phone firms in Kenya

[1]Omariba Nyabate Esinah
[1]Department of management science, University of Nairobi, University Way.
Corresponding author's e-mail: omaribanyabate@gmail.com

ARTICLE INFO

Article history:
Received Date: 16th Nov 2018
Revised Date: 8th Dec 2018
Accepted Date: 16th Dec 2018

Keywords:
Green supply chain, supply chain management, supply chain management practices, supply chain performance, Kenya

ABSTRACT

Purpose: 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.

Design/ Methodology/Approach: 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.

Findings: The major findings were: that there was a significant relationship between green management practices and supply chain performance represented by R2 value of 0.737 which translates to 79.4% variance explained by the five independent variables of green management practices improves supply chain performance. Green supply chain management practices are significant in enhancing the performance of supply chains.

Contribution to policy and practice: 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.

Originality/Value: The study contributes to the academic understanding of how green supply chain management and supply chain performance literature. As such, the present research may assist scholars to move beyond a simple dyadic context and toward examining complete supply networks.

Background

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 & 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 endeavours 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).

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, and warehousing and inventory management. The firms have to consider a mode of transport with less carbon print, better packaging methods like recyclable containers, well designed warehouses and improved inventory management skills. Green marketing focuses on the green products like hybrid vehicles and the greening of processes like reducing carbon prints. These practices are geared towards reducing the impact of the product to the environment (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.

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 supplychain management can be used as 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.

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 (previously known as Kencell communications) were licensed to provide mobile services (Luca et al, 2012). 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%. 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).

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 topic was also geared towards determining green supply chain management practices, the key drivers and the relationship between GSCM and supply chain performance. The study found that Green supply chain management practices are significant in enhancing the performance of supply chains. It recommended mobile phones companies to 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.

Literature Review

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).

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 Brundtl and 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, 2011).

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). 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 advices its customers to return the products that are faulty for replacement or repair.

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, it did no translate 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).

Green supply management

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 & Klassen, 2010). The Green supply chain management practices include:

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).

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 towards 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.

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).

Internal environment 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.

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).

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 foe 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.

Materials and Methods

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 (4 procurement managers, 5 users, 4 procurement staff, 10 agents, 10 suppliers to Safaricom and others, and 10 newly licensed). Questionnaires were employed to collect data. The questionnaires were divided into four parts according to the objectives under investigation in the study. Regression and correlation analysis using SPSS version 25 were used to achieve the study objectives with green supply chain management practices as the independent variables and supply chain performance as the dependent variable.

Results

Correlation Analysis

Correlation analysis matric (Table 1) was used to determine both the significance and degree of association of the variables and also predict the level of variation in the dependent variable caused by the independent variables. To compute the correlation (strength) between the study variables and their findings the study used the Karl Pearson's coefficient of correlation (r). 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 supplychain 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 1 Correlation Results

Variables	1	2	3	4	5
1.Supply chain performance	1				
2. Reverse logistics	.557**	1			
3. Green procurement	.512**	.590**	1		
4.Waste management	.518**	.580**	.446**	1	
5. Eco-design packaging	.538**	.642**	.663**	.656**	1

** Correlation is significant at the 0.05 level (2-tailed).

Regression Analysis

Multivariate regression analysis was used to determine the significance of the relationship between the dependent variable and all the independent variables pooled together. Table 2 shows the model summary.

Table 2 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	. 738[a]	.545	.214	.160

a) Predictors: (Constant), Procurement planning , Procurement disposal procedures, Procurement Record Management, Procurement code of ethics, Complaints Review Mechanism

b) Dependent Variable: procurement performance

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.

Table 3 ANOVA Results

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12.624	4	3.156	9.793	.009[b]
	Residual	30.616	95	0.322		
	Total	43.240	99			

As shown in Table 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.

Table 4 Regression Results

Model		Unstandardized Coefficients		Standardized Coefficients	Sig.
		B	Std. Error	Beta	
1	(Constant)	1.180	0.3303		0.5881
	Reverse logistics	0.541	0.1530	0.048	0.201
	Green procurement	0.507	0.1658	0.017	0.026
	Waste management	0.518	0.1502	0.3209	0.025
	Eco-design packaging	0.528	0.1398	0.2527	0.0223
	Internal environment management	0.507	0.1658	0.0170	0.0262

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 be co-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.

Conclusion

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.

Areas for Further Research and 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.

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.

Declaration of Interests

The author declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Author Statement

The authors declare that all of us have seen and approved the final version of the manuscript being submitted. They warrant that the article is the authors' original work, hasn't received prior publication and isn't under consideration for publication elsewhere.

Reference List

Abuko, A.A. (2011). The Impact of GSCM on the performance of oil companies in Kenya. Unpublished MBA project UON.

Christopher M. (2011), Logistics & supply chain Management .4thEdition .London: Pearson Education

Chang, H. and Tsai, Y. and Hsu, C. (2013). E-procurement and supply chain performance. Supply Chain Management: An International Journal, 18(1), 34–51.

Chege, E. (2012). Green Supply Chain Management and Supply Chain Performance of Private hospitals in Nairobi Kenya. Unpublished MBA project UON.

Cognizant. (2008). Creatinga Green Supply Chain Information Technology as an Enabler for a Green Supply Chain.

Colicchia,C. and Melacini, M. and Perotti, S. (2011). Benchmarking supply chain sustainability: insights from a field study. Benchmarking: An International Journal18 (5), 705-732.

Green Jr. K. Zelbst, P. Meacham, J. and Bhadauria, V. (2012). Green supply chain management practices: impact on performance Supply Chain Management: An International Journal, 17(3), 290–305.

Jumadi, H. and Zailani, S. (2010). Integrating green innovations inlogistics services toward logistics service sustainability: a conceptual paper, Environmental Research Journal,4 (4), 261-71.

Khisa, J.N. (2011). Green procurement in public sector a case of parastatals in Kenya. Unpublished MBA project UON.

King, A.A.and Lenox, M.J. (2001). Lean and green? An empirical examination of the relationship between lean production and environmental performance Production and OperationsManagement, 10 (3), 244-56.

Kumar, R. and Chandrakar, R. (2012). Overview of Green Supply Chain Management: Operation and Environmental Impact at Different Stages of the Supply Chain. International Journal of Engineering and Advanced Technology, 1(3), 2249 – 8958.

Menzel, V. Smagin, J. and David, F. (2010). Can companies profit from greener manufacturing? Measuring Business Excellence Journal,14 (2), 22-31.

Muchiri, T.K (2011). Green Supply Chain Implementation: Best Practices and ChallengesSchool of Business, University of Nairobi. AIBUMA conference.

Ninlawan, C., Seksan P., Tossapol K., and Pilada W. (2010). The Implementation of Green Supply Chain Management Practices in Electronics Industry. Proceedings of the international multiconference of engineers and computers, 3.

Obiso, E.I. (2011). A survey of Green Supply Chain Managementin the petroleum marketing firms in Kenya.Unpublished MBA project UON.

Supply-Chain Council.(2010). Supply-chain operations reference-model. www.supply-chain.org, accessed: 8/07/2013.

Walker, H. and Jones, N. (2012). Sustainable supply chain management across the UK private sector,SupplyChain Management: An International Journal, 17(1), 15–28.

Whitten, G.D, Green Jr, K. and Zelbst, P. (2012). Triple-A supply chain performance . International Journal of Operations & Production Management, 32(1), 28-48.

Wu, J. and Dunn, S. (2012). A Study on Green Supply Chain Management Practices among Large Global Corporations. Journal of Supply Chain and Operations Management, 10(1)