INFLUENCE OF GREEN PROCUREMENT PRACTICES ON SUPPLY CHAIN PERFORMANCE IN HUMANITARIAN ORGANIZATIONS IN KENYA: A CASE OF KENYA RED CROSS SOCIETY

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ABSTRACT

The purpose of this study was to establish the influence of green procurement practices on the supply chain performance of humanitarian organizations in Kenya. This study was conducted through a descriptive survey research design. The study involved 70 employees of Kenya Red Cross Society. Questionnaires were used as the main data collection instruments and a pilot study was undertaken to pretest the questionnaires for validity and reliability. Descriptive statistics were used aided by Statistical Package for Social Scientists (SPSS) to compute percentages of respondents' answers. Inferential statistics using, multiple regression and correlation analysis were applied to aid examining the relationship between the research variables. The findings were analyzed using descriptive statistics and highlighted the state of the institution; conclusions and the necessary recommendations. It was notable that there exist strong positive relationship between the indepedent variables and depedent variable as shown by R value (0.821). The coefficient of determination (R^2) explained 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 and the four independent variables that were studied explain 67.40% of the supply chain performance and represented by the R^2. This therefore meant that other factors not studied in this research contributed 32.60% of the supply chain performance. This implied that these variables were very significant therefore needed to be considered in any effort to boost supply chain performance. The study therefore identified the variables as critical factors of green procurement practices that influenced supply chain performance in humanitarian organizations.

Key Word: *Green Purchasing, Manufacturer and Supplier Collaboration, Green Distribution, Reverse Logistics, Humanitarian Organizations*

INTRODUCTION

Development of supply chain networks in the 21st century is pegged not only to the stiff competition in the market but also globalization trends and challenges to which centrally relate to environmental sustainability (Vachon, 2007). The concern in the business and industrial sector is on how to balance productivity, profit margins, and competitiveness alongside maintaining the integrity of the environment. This has led to evolution in business processes through restructuring of supply chain networks to achieve the thresh hold of environment sustainability through managing and 'greening' the entire chain from upstream suppliers to the end downstream consumer (Azevedo*et al,* 2011). The concept under greening is to sustainably extract resources from the environment either mining or in agricultural production and also reducing pollution by managing the byproducts, e-packaging and recycling (Zhu, *et al,* 2007).

The environmental concerns which include over extraction or over exploitation of natural resources, environmental pollutions through emissions during transportation and manufacturing, by products, packaging and the final waste produced after consumption have become important factors in designing of business strategies. The strategies entail managing the whole chain which involves designing and adopting practices known as Green Supply Chain Management. Srivastva (2007) states that green supply chain management is integrating environmental thinking into supply-chain management, including product design, material sourcing and selection, manufacturing processes, delivery of the final product to the consumers as well as end-of-life management of the product's useful life. The strategy of GSCM entails reverse logistics, green procurement, green operations, green designs, waste management and green manufacturing (Azevedo*et al,* 2011).

Balancing economic and environmental performance has become increasingly important for organizations facing competitive, regulatory, and community pressures (Vaccarro, 2009). The present day competition characterizing business environments coupled with increased pressures for environmental sustainability, has required that enterprises need to implement strategies to reduce the environmental impacts of their products and services and thus to establish their environmental image which requires that enterprises have to re-examine the purpose of their business (Li & Green,2012). However, it is not just about being environment friendly; it is about good business sense and higher profits. In fact, it is a business value driver and not a cost centre (Liu &Motzer, 2012).

With the increasing awareness on environmental sustainability issues, manufacturing firms have now began to think and act green. In addition, firms need to implement wise strategies in order to compromise with green issues without neglecting their business objectives. In addition, there are three main approaches that are involved in the creation of "green" supply chains; environment, strategy and logistics (Hwa, 2010). This is a problem for all firms and governments the world over given the fact that environment degradation does not occur in isolation to the regions causing the pollution but is felt miles and miles away from its source. For instance, in Malaysia, environmental issues have become a priority for the government and public (Eltayeb*et al,* 2010). The Manufacturing industry in the country is one of the main contributors to environmental deterioration, with the Department of Environment Annual Report 2010 showing that pollution from the manufacturing industry has increased from 85%to 97% between 2005 and 2009 respectively (Seman, 2012).

As a developing country, Kenya has to balance both operational and environmental performance. Nasiche&Ngugi (2014), on the extent of GSCM practices adoption in the food manufacturing industry found out that GSCM practices adoption is still low as most manufacturing firms like in the

food sector are still planning to consider adoption, except for eco-design practices which are currently under consideration (Chao &Heijungs, 2013). In addition, the international incorporated companies are currently considering adoption as compared to the local companies who were still planning to consider. A little bit of improvement on both environmental and operational performance is being realized as a result of adopting GSCM practices (Obiso, 2011).

Supply chains are a set of activities that promote the flow of materials, information, and financial resources. Humanitarian supply chains link donations from suppliers to aid recipients with the objective of saving lives and reducing human suffering (SPHERE, 2011). The extent to which humanitarian supply chains met their goals is determined using performance metrics such as response time, appeal coverage, financial efficiency, number of items provided, supply availability and adaptability to varying locations, magnitudes of disaster (Abidi & Klumpp, 2013; Beamon&Balcik, 2008).

Green procurement contributes directly to effectiveness and efficiency of the supply chains. Environmentally friendly products are easily recycled, last longer or produce less waste. This allows organizations to save money on waste disposal, reduce the harmful impact of pollution and relieve the stress on landfills (IISD, 2013). Green products require fewer resources to manufacture and operate so that savings can be made on energy, water, fuel and other natural resources. For instance, an eco-efficient product will often use less energy and represent lower costs as waste because it is included in a re-use system and it does not contain hazardous substances (UNDP, 2008).

Statement of the Problem

Green procurement contributes directly to effectiveness and efficiency of the supply chains. Environmentally friendly products are easily recycled, last longer or produce less waste. This

allows organizations to save money on waste disposal, reduce the harmful impact of pollution and relieve the stress on landfills (IISD, 2013). Green products require fewer resources to manufacture and operate so that savings can be made on energy, water, fuel and other natural resources. For instance, an eco-efficient product will often use less energy and represent lower costs as waste because it is included in a re-use system and it does not contain hazardous substances (UNDP, 2008).

Humanitarian organizations in Kenya faces green supply management challengesThe underlying concept of GSCM encompasses environmental initiatives in inbound logistics which includes green purchasing, eco-design and production as outbound which includes reverse logistics (Srivastava, 2008; Zhu *et al*, 2007; Lee, 2008). The undertaken initiatives involve the relevant stakeholders such as materials suppliers, service contractors, vendors, distributors and end users whom work cohesively to reduce or eliminate adverse environmental impacts which can possibly give rise due to their activities (Beamon, 1999; Vachon and Klassen, 2006; Hanim, 2012).

Several studies have been done on GSCM to consider the need for a green design to reduce the impact of product waste where issues such as green production, green planning and manufacturing (Darnall*et al*, 2008; Sarkis&Cordeiro, 2008; Kannan&Devvika, 2009) and product recovery (Gupta &Dessai, 2011; Linton & Jayaramann,2007) are discussed. Beamon&Fernandes(2004) discussed recycling in the supply chain and critique GSCM by saying that Environmental Management Systems (EMS) are making less progress in reducing environmental harms. These studies, however, are of limited focus with paucity of scholarly investigation on the effectiveness of GCSM in enhancing the competitive edge of the firms in food and beverage sector. Most studies have focused on GSCM innovations (Mattos& Hall, 2007); drivers of GCSM (Closs& Meacham, 2011) and green supply chain performance in manufacturing firms (Vashta, 2012). This study aimed at bridging this gap by

investigating the effects of GSCM on supply chain performance in humanitarian organizations in Kenya.

Objectives of the Study

The purpose of the study will be to establish the influence of green procurement practices on the supply chain performance of humanitarian organizations in Kenya. The specific objectives were:-

- To assess the effect of green purchasing on supply chain performance of humanitarian organizations in Kenya
- To establish the influence of green manufacturer /supplier collaboration on supply chain performance of humanitarian organizations in Kenya
- To examine the influence of green distribution on supply chain performance of humanitarian organizations in Kenya
- To find out the influence of reverse logistics on supply chain performance of humanitarian organizations in Kenya

LITERATURE REVIEW

Theoretical Review

Grey Theory

Grey theory which was developed by Deng in 1982 is a mathematical model for solving problems that involve uncertainties and for handling systems with incomplete information. Grey means poor, incomplete or uncertain information. Thus, systems which lack information are referred to as Grey Systems (J.L., 1982). According to the grey theory, information is classified into three categories depending on the degree of information obtained. It is said to be white when it is completely certain, black when it is unknown and grey when it is insufficient (Yang, Liu, & John, 2014).

Natural Resource-Based Theory

Developed by Hart in 1995 (Hart & Dowell, 2011), the natural resource-based view (NRBV) provides a mechanism for linking environmental actions to performance. The NRBV argues that for firms to achieve a competitive advantage, they need to invest their natural resources in initiatives aimed at pollution prevention, product stewardship, and sustainable development achieve a competitive advantage.

Pollution prevention is a process whose aim is to prevent waste and emissions thereby minimizing costs. Product stewardship focuses on the entire value chain of the firm's product systems. Hart argued that firms that engage various stakeholders are able to effectively integrate environment factors into the product design and development process (Hart & Dowell, 2011).
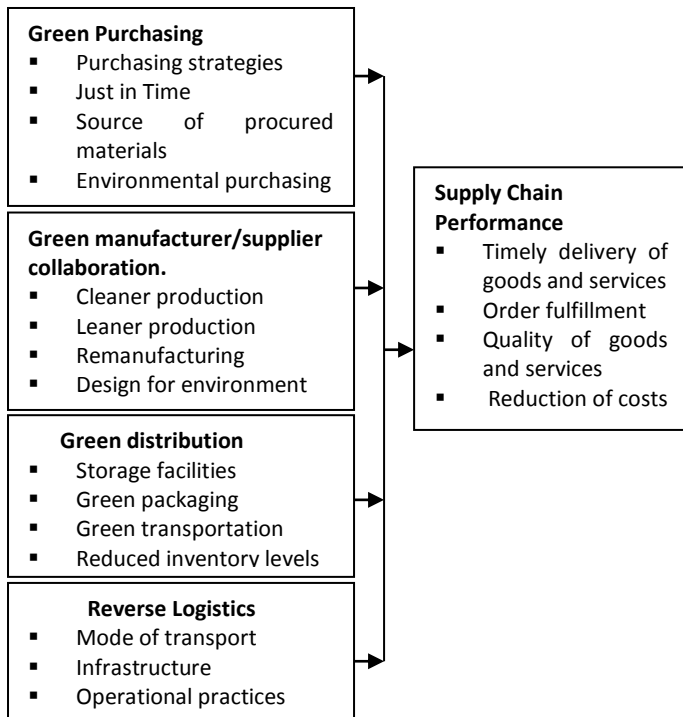
Finally, a sustainable development strategy aims at establishing production systems that can be maintained into the future. Molamohamadi et al., (2013) established that engaging high-value suppliers contribute to sustainability through conservation of natural resources and reducing industrial pollution. One of the approaches that organizations use to minimize pollution, maintain communication with the stakeholders and select high-value suppliers is E-procurement.

Supply Chain Operations Reference Theory

The Supply Chain Operations Reference model provides a unique framework that links logistics performance metrics, processes, best practices, and people into a unified structure (Smith &Marlkand, 2007). The framework supports communication between supply chain partners and enhances the effectiveness of supply chain management logistics, technology, and related supply chain improvement activities. Business value, whether real or perceived, is derived from the predictability and sustainability of business outcomes. It lives, healthy or sick, in those gaps between expected vs. perceived vs. actual performance (O'Farrell, 2008).

Value is articulated by measuring what is being managed. The SCOR model helps refine strategy, define structure (including human capital), manage processes, and measure performance (Larsson *et al*, 2008).

Conceptual Framework

Green Purchasing
▪ Purchasing strategies
▪ Just in Time
▪ Source of procured materials
▪ Environmental purchasing

Green manufacturer/supplier collaboration.
▪ Cleaner production
▪ Leaner production
▪ Remanufacturing
▪ Design for environment

Green distribution
▪ Storage facilities
▪ Green packaging
▪ Green transportation
▪ Reduced inventory levels

Reverse Logistics
▪ Mode of transport
▪ Infrastructure
▪ Operational practices

Supply Chain Performance
▪ Timely delivery of goods and services
▪ Order fulfillment
▪ Quality of goods and services
▪ Reduction of costs

Independent Variables   Dependent Variable

Figure 1: Conceptual Framework

Source: Author (2018)

Green Purchasing

Green procurement is defined as an environmental purchasing consisting of involvement in activities that include the reduction, reuse and recycling of materials in the process of purchasing (Vachon&Klassen, 2007). Besides green procurement is a solution for environmentally concerned and economically conservative business, and a concept of acquiring a selection of products and services that minimizes environmental impact (Salam, 2008).From the purchasing perspective of the supply network it is under discussion that GSCM practices has several benefits, ranging from cost reduction to integrating suppliers in a participative decision-making process that promotes

environmental innovation (Bowen et al., 2001; Hall, 2003; Rao, 2002). Green purchasing strategies which is the largest part of inbound logistics side is adopted by organizations to respond to the global concern of environmental stability(Chau& Chung, 2010).

Green Manufacturer/Supplier Collaboration

There are several notions that could be explained about green supply chain in production phase, such as cleaner production, design for environment, remanufacturing and lean production. Lean production has an importance to decrease the environmental impact of the internal supply chain. Lean production improves environmental performance by reducing general waste and minimizing hazardous wastes.

Green production is defined as production processes which use inputs with relatively low environmental impacts, which are highly efficient, and which generate little or no waste or pollution. Green production can lead to lower raw material costs, production efficiency gains, reduced environmental and occupational safety expenses, and improved corporate image (Wilson and Meker, 2003). Green production aims to reduce the ecological burden by using appropriate material and technologies, while reproduction refers to an industrial process in which worn-out products are restored to like-new condition Virjoef&Koskella, 2000).

Green Distribution

Manufactured products have to reach the market in time; the market has to be informed about the products' availability, their features and capabilities. This requires appropriate distribution and marketing systems. It is important that environmental concerns are taken care of by offering environmentally friendly products through environmentally friendly distribution and marketing system. Green distribution is achievable through; green packaging, green transportation and logistics (Nerkar, 2012).

According to Blecker&Hestta (2007) Green packaging involves downsized packaging and use of green packaging materials. They also point out the need to cooperate with vendors to standardize packaging, encourage and adopt returnable packaging methods, promote recycling and reuse of packaging materials. The storage facility is another important aspect of green distribution. The storage facility should be capable of storing different categories of materials. In addition, the design and construction of storage facilities must meet the requirements of non-polluted environment, while strengthening maintenance of good humidity, corrosion, waterproofing among other factors (Zhang and Zheng, 2010). Key in distribution is transportation, According to Shultz, & Holbrook, (2009), factors like: fuel, modes of transport, infrastructure, and operational practices are important factors to consider in developing green transportation.

Reverse Logistics

On the outbound side of the green supply chain, reverse logistics, environment-friendly packaging, and environment-friendly distribution, are all initiatives that might improve the environmental performance of an organization and its supply chain. Management of wastes in the outbound function such as reverse logistics and waste exchange can lead to cost savings and enhanced competitiveness (Rao, 2003). Many of these initiatives involve compromises between various logistics functions as reverse logistics and environmental consideration in order to improve the environmental performance of an organization. In an eco-transportation system, required parameters of a transportation system such as type of transport, fuel sources, infrastructure, operational practices and organization, can be considered. These parameters and the dynamics that connect them, determine the environmental impact generated in the transportation logistics phase of the supply chain (Kam*et al*, 2003).According to Liu & Zhang (2010), reverse logistics refers to the role of logistics in product

returns, source reduction, recycling, materials substitution, reuse of materials, waste disposal, repair and remanufacturing. It is a system for the recovery of used materials and products.Tibben-Lembke (2002) define reverse logistics as the process of planning, implementing, and controlling the efficient, cost-effective flow of raw materials, in-process inventory, finished goods and related information from the point of consumption to the point of origin for the purpose of recapturing value or proper disposal.

Empirical Review

Min and Galle (1997, 2001) find that the two most highly rated obstacles to effective implementing green purchasing was cost and revenue. In the process of implementing green procurement, the enterprise is bound to increase investment, training staff costs and the communication costs with suppliers, etc, which hence causes the loss of other investment opportunities (Liu and Zhu, 2009) This study will define these the increase of investment and cost as the corporate environmental management cost. Zhu Qinghua*et al,* (2004) found the suppliers stress had greater impact on the implementation of green supply chain through research. FangmiaoHou (2007) pointed out that the close cooperation of suppliers and buyers would promote the successful completion of green purchasing activities.

Florida and Davison (2001) surveyed 580 manufacturing plants in the US adopting cleaner production techniques. Their research reveals that green corporations are innovative in their environmental practices, and these strategies emerge from a real commitment towards reducing waste and pollution. Lean production/manufacturing is also an important consideration in reducing the environmental impact of the production phase.

Sanches&Ferez (2001) also investigated the link between lean production practices in manufacturing organizations and resultant

enhanced competitiveness. Lean production is also expected to improve environmental performance of the firms through good housekeeping practices, such as general waste reduction and minimizing hazardous wastes. King and Lenox (2001) conclude that lean production is complementary to improvements in environmental performance and it often lowers the marginal cost of pollution reduction thus enhancing competitiveness.

Previous research has explored the relationships between green distribution practices and competetiveness of firms including environmental, economic and operational performance. Literature has offered insight on potential patterns of supply-chain relations for improving environmental performance (Handfield*et al,* 2002). The literature for supporting such positive relationships is relatively strong. For example, Frosch (1994) argued that an inter-firm linkage facilitated by proximity could lead to improvement in environmental performance. Dodgson (2000), Dyer and others argued that inter-firm relations provide formal and informal mechanisms that promote trust, reduce risk and in turn increase innovation and profitability. However, through examination, Bowen *et al,* (2001) suggested economic performance is not being reaped in short-term profitability and sales performance.

The study by Rao (2003) does identify that organizations in South East Asia believe that greening the inbound logistics function has led to using environmentally-friendly raw materials, greening of production to cleaner production, prevention of pollution as well as waste at the source; whereas greening outbound logistics led to environmentally-friendly waste disposal and mitigation of the effects of pollution through waste water treatment and abatement of emissions (Rao, 2003). Such initiatives lead to improvements in environmental performance, and reduce the risk of non-compliance, penalty and threat of closure. Another research was conducted on a sample of 400 respondents in Pakistan. It was concluded that

Green purchasing intentions of consumers exerted strong positive influence over the actual purchasing behavior of green products by the consumers.

In recent years, a lot of work related to quantitative approaches in reverse logistics has been published. Shih (2001) discusses in detail the reverse logistics system planning for recycling electrical appliances and computers in Taiwan. Hu et al, (2002) present a cost-minimization model for a multi-time-step, multi-type hazardous-waste reverse logistics system. They present application cases to demonstrate the feasibility of their proposed approach. Nagurney and Toyasaki (2005) develop an integrated framework for modelling the electronic waste reverse logistics network which includes recycling, while the framework of Srivastava and Srivastava (2005) incorporates three types of rework facilities. Ravi et al. (2005) use analytical network process (ANP) and balanced score card for analyzing reverse logistics alternatives for end-of-life computers.

METHODOLOGY

The research design employed was descriptive survey where data was collected one point in time. Mugenda and Mugenda (2008) notes that a descriptive survey seeks to obtain information that describes existing phenomena by asking questions relating to individual perceptions and attitudes. Target population is defined by Kothari (2008) as a universal set of the study of all members of real or hypothetical set of people, events or objects to which an investigator wishes to generalize the result. In this study the target populations were 70 employees of Kenya Red Cross drawn from procurement and related departments who were engaged in procurement activities. Data was analyzed using statistical package for social science (SPSS) version 21 and Excel. All the questionnaires received were referenced and items in the questionnaire coded to make data entry easy. The Multiple Regression model that aided the analysis of the variable relationships was as follows:

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

Where, Yi= Supply Chain Performance;

β_0= constant (coefficient of intercept),

X_1= Green Purchasing;

X_2= Green Manufacturer/Supplier collaboration;

X_3= Green distribution;

X_4= Reverse Logistics;

ε = Error term;

$\beta_1 \ldots \beta_4$= regression coefficient of four variables.

RESULTS

For descriptive analysis of the variables, a scale of 1-5 was used. A scale of: 1= very small extent; 2= to a small extent; 3= moderate extent; 4=Great extent and 5= very great extent The scores "Very small extent" and "Small extent" were represented by mean score, equivalent to 1 to 2.5 on the continuous Likert scale ($1 \leq$ Small extent ≤ 2.5). The scores of 'Moderate extent' were represented by a score equivalent to 2.6 to 3.5 on the Likert scale ($2.6 \leq$ Moderate ≤ 3.5). The score of "Great extent" and "Very great extent" were represented by a mean score equivalent to 3.6 to 5.0 on the Likert Scale ($3.6 \leq$ Great extent ≤ 5.0). The results were presented in mean and standard deviation.

Green Purchasing

The research sought to determine from the respondents the extent to which organizations implemented the green purchasing practices in an effort to improve supply chain performance in the organization. From the research findings, majority of the respondents indicated that they agreed that the organization had formally introduced environmental issues into purchasing process as shown by a mean of 4.10; the organizations had formally integrated environmental concerns into to supplier assessment process as shown by a mean of 3.95; the organization had formally implemented use of environmentally friendly process as shown by a mean of 4.01; the organization had formally introduced the designing of products that minimize material and energy consumption as shown by a mean of 3.99; the organizations were inclined to use of recyclable and reusable material and parts as shown by mean of 4.10. The organizations had formally introduced the use of alternative fuels, treatment and control of post combustion emissions and waste reduction as shown by mean of 3.95. This implies that majority of the organizations had started recognizing the role of green procurement practices on enhancing supply chain performance in the organization.

The findings of this study wre in tandem with literature review by Chau& Chung, 2010) who states that green purchasing strategies which is enhance issues such as using environmental transportation, cost, reduction, material substitution and waste minimization of hazardous materials.

Table 1: Elements Relating to Green Purchasing Practices

Statement	VSE	SE	ME	GE	VGE	Mean	Std deviation
The organization has formally introduced environmental issues into purchasing process	6%	6%	9%	71.5%	7.5%	4.10	0.32
The organization has formally integrated environmental concerns into to supplier assessment process	6.5%	8%	7%	67.5%	11%	3.95	0.36
The organization has formally implemented use of environmentally friendly process	6.5%	6.5%	6.5%	72.5%	8%	4.01	0.44
The organization has formally introduced the designing of products that minimize material and energy consumption	5.5%	11%	6.5%	67.5%	9.5%	3.99	0.65

	VSE	SE	ME	GE	VGE	Mean	Std deviation
The organization is inclined to use of recyclable and reusable material and parts	6%	6%	9%	6.8%	11%	4.10	0.32
The organization is has formally introduced the use of alternative fuels, treatment and control of post combustion emissions and waste reduction	10%	8%	7%	67.5%	7.5%	3.95	0.36

Green Manufacturer/Supplier Collaboration

The research sought to determine from the respondents the extent to which organizations implemented the green manufacturer/ supplier collaboration practices to boost supply chain performance in the organization. From the research findings, majority of the respondents indicated to a great extent that the organization had formally introduced designing of products that minimize material and energy consumption as shown by a mean of 4.10, The organization had formally introduced usage of material and parts that are reusable and recyclable as shown by a mean of 3.95, the organization had formally introduced use of biodegradable materials. as shown by a mean of

4.01, the organization had formally introduced use of alternative fuels, treatment and control of post combustion emissions as shown by a mean of 2.99, the organization had implemented waste reduction measures in its production processes as shown by mean of 4.10.This implied that majority of the organizations had started recognizing the role of green production practices on enhancing competitiveness with other organizations in the food and beverage sector.

The findings of the study were in agreement with literature review by Sangeeta (2012), who indicated that green production involves use of fast, reliable, and energy efficient production equipment aimed at eliminating wastes and improving productivity.

Table 2: Elements Relating to Green Manufacturer/Supplier Collaboration

Statement	VSE	SE	ME	GE	VGE	Mean	Std deviation
The organization has formally introduced designing of products that minimize material and energy consumption	6%	6%	9%	68%	75%	4.10	0.32
The organization has formally introduced usage of material and parts that are reusable and recyclable.	6.5%	8%	7%	67.5%	7.5%	3.95	0.36
The organization has formally introduced use of biodegradable materials.	6.5%	6.5%	6.5%	72.5%	6.5%	4.01	0.44
The organization has formally introduced use of alternative fuels, treatment and control of post combustion emissions	5.5%	67.5%	10%	11%	9.5%	2.99	0.65
The organization has implemented waste reduction measures in its production processes.	10%	6%	9%	68%	7.5%	4.10	0.32

Green Distribution

The research requested the respondents to indicate the extent to which organizations implemented the green distribution practices in an effort to enhance supply chain performance in the organization. From the results, majority indicated to a small extent the

organization had formally introduced freight consolidation aimed at transporting more goods efficiently as shown by a mean of 3.01; the organization had formally implemented route planning and scheduling to avoid rush hour traffic as shown by a mean of 3.99, the organization had

formally implemented route planning that avoids congested town centers by use of alternative routes as shown by a mean of 3.10 and the organizations had invested in modern infrastructure to reduce delivery time as shown by a mean of 2.10. This was deduced that majority of the organizations had not started recognizing the role of green distribution practices on enhancing competitiveness with other organizations in the food and beverage sector. The above findings collaborated with literature review by Nerkar(2012) who indicated that green distribution is achievable through; green packaging, green transportation and logistics According to Blecker&Hestta (2007) the storage facility is another important aspect of green distribution.

Table 3: Elements Relating to Green Distribution Practices

Statement	VSE	SE	ME	GE	VGE	Mean	Std deviation
The organization has formally introduced freight consolidation aimed at transporting more goods efficiently	6.5%	72.5%	8.5%	6.5%	6%	3.01	0.44
The organization has formally implemented route planning and scheduling to avoid rush hour traffic	5.5%	11%	6.5%	67.5%	9.5%	3.99	0.65
The organization has formally implemented route planning that avoids congested town centers by use of alternative routes	6%	68%	9%	6%	11%	2.10	0.32
The organization has invested in modern infrastructure to reduce delivery time.	6.5%	72.5%	8.5%	72.5%	6%	3.01	0.44

Reverse Logistics

The research requested the respondents to indicate the extent to which organizations implemented the reverse logistics practices to enhance supply chain performance in the organization. From the research findings, majority of the respondents indicated to a large extent that; the organization had green logistics as an important element in its supply chain as shown by a mean of 3.99; the organizations incorporated 'greenness' as a key factor in its environmental impact assessment as shown by a mean of 4.10; the organizations took into account the effect of its production activities to the environment and society as shown by a mean of 4.01; the organizations employed environmentally friendly logistic system as a way of reducing energy consumption and pollution as shown by a mean of 4.10; the organizations recognized invests in advocacy for green processes aimed at eliminating waste, pollution and conserving the environment as shown by mean of 3.95; the job allowed employee to plan their work as indicated by a mean of 4.01; the organizations had formally introduced freight consolidation practices as shown by mean of 3.99; the organization practiced route mapping and planning as shown by 3.99; the organizations had formally introduced reverse logistics into its processes as shown by a mean of 4.10, the organization had formally implemented planning and controlling efficient cost effective flow of raw materials from point of consumption to origin as shown by mean of 4.10 and the organization accepted previously shipped products or parts for the purpose of recycling as shown by mean of 2.05.

The finding of this study concurred with literature review by Mollenkopf and Russo (2011) who states that reverse logistics strategies should have a developed a hierarchical decision-making framework to find the feasibility of profit-driven reverse logistics networks.

Table 4: Elements Relating to Reverse Logistics Practices

Statement	VSE	SE	ME	GE	VGE	Mean	Std deviation
The organization has green logistics as an important element in its supply chain	6.5%	6.5%	8.5%	72.5%	6%	3.99	0.65
The organization incorporates 'greenness' as a key factor in its environmental impact assessment	5.5%	11%	6.5%	67.5%	9.5%	4.10	0.32
The organization takes into account the effect of its production activities to the environment and society	6%	6%	9%	68%	11%	4.01	0.44
The organization employs environmentally friendly logistic system as a way of reducing energy consumption and pollution	6.5%	6.5%	8.5%	72.5%	6%	4.10	0.32
The organization recognizes invests in advocacy for green processes aimed at eliminating waste, pollution and conserving the environment.	6.5%	6.5%	8.5%	72.5%	6%	3.95	0.36
The organization has formally introduced freight consolidation practices	5.5%	14.5%	6.5%	67.5%	6%	4.01	0.44
The organization practices route mapping and planning	5.5%	11%	6.5%	67.5%	9.5%	3.99	0.66
The organization has formally introduced reverse logistics into its processes	6%	6%	9%	68%	11%	3.99	0.65
The organization has formally implemented planning and controlling efficient cost effective flow of raw materials from point of consumption to origin	5.5%	67.5%	10%	11%	9.5%	4.10	0.32
The organization accepts previously shipped products or parts for the purpose of recycling.	68%	6%	9%	10%	7.5%	2.05	0.36

Supply Chain Performance

On the extent to which supply performance in the organization, respondents were asked to indicate the extent to which the green procurement practices determined the supply chain performance. The data was collected from the different indicators of the variable supply chain performance which was ordinal categorical. The data was therefore presented in frequency tables with the median being used as the appropriate measure of central tendency. The first indicator for the dependent variable required to know what the organizations level supply performance was timely delivery of goods and services was, 0% of the respondents had 0-20%, 3% had 20-30%, 11% had 30-40%, 17% had 40-50%, 69% had had over 50%. The modal class was of the respondents who had over 50% timely delivery of goods and services. The mode was found to be 5 which implied that on average the organizations level of timely delivery of goods and services is over 50%.

The next indicator required the respondents to state the level of minimization of procurement expenditure in the organization, 3% of the respondents had 0-20%, 3% had 20-30%, 14% had 30-40%, 26% had 40-50%, 49% had over 50%. The modal class was of the respondents who had over 50%. The median was found to be 5 which implied that on average firm's levels of minimization of procurement expenditure was by over 50%. When the respondents were asked what the level of order fulfillment was, 0% of the respondents 0-20%, 3% had 20-30%, 3% had 30-40%, 34% had 40-50%, 60% had over 50%. The modal class was of the

respondents who had over 50% level of order fulfillment. The median was found to be 5 which implied that on average the level of level of order fulfillment in organizations is over 50%.

Finally, the respondents were asked what the level of quality of procured goods and services offered

was, 0% of the respondents 0-20%, 3% had 20-30%, 20% had 30-40%, 43% had 40-50%, 34% had over 50% The modal class is of the respondents who had between 40-50% quality level. The mode was found to be 4 which implied that on average the level of quality of procured goods and services offered is between 40-50%.

Table 5: Supply Chain Performance Statistics

Statement	0%-10%	11%-20%	21%-30%	31%-40%	Over 40%	Mode
What is the level of timely delivery of goods and services?	0	3	11	17	69	5
What is the level of minimization of procurement expenditure?	3	3	14	26	49	5
What is the level of order fulfillment?	0	3	3	34	60	5
What is the level of quality of procured goods and services offered?	0	3	20	43	34	4

Multiple Regression Analysis

According to the model summary Table 6, R was the correlation coefficient which showed the relationship between the indepedent variables and depedent variable. It was notable that there exist strong positive relationship between the indepedent variables and depedent variable as shown by R value (0.821). The coefficient of determination (R^2) explained 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

and the four independent variables that were studied explain 67.40% of the supply chain performance and represented by the R^2. This therefore meant that other factors not studied in this research contribute 32.60% of the supply chain performance. This implied that these variables were very significant therefore need to be considered in any effort to boost supply chain performance. The study therefore identified the variables as critical factors of green procurement practices that influence supply chain performance in humanitarian organizations.

Table 6: Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.821	.674	.658	.021

Analysis of Variance

From the ANOVA statics, the study established the regression model had a significance level of 0.002 which was an indication that the data was ideal for making a conclusion on the population parameters

as the value of significance (p-value) was less than0.05. The calculated value was greater than the critical value (35.908>14.876) indicating that green procurement, green production, green distribution and reverse logistics all influence supply chain performance. The significance value was less than 0.05 indicating that the model was significant.

Table 7: Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	28.400	4	7.1002	35.908	.002[b]

Residual	11.867	55	.21576	
Total	40.267	59		

a. Dependent Variable: Supply Chain Performance
b. Predictors: (Constant), Green procurement, Green production, Green distribution, Reverse logistics

Critical value =14.876

Regression Coefficients

From the data, it was established that regression equation was Y = 33.298 + 0.865X_1 + 0.768 X_2 + 0.611 X_3 + 0.543 X_4. Therefore, supply chain performance = 33.298 + (0.865 x green purchasing) + (0.768 x green manufacturer/supplier collaboration) + (0.711 x green distribution) + (0.611 x reverse logistics). From the results of this study, green procurement contributed more to the supply chain performance. The finding revealed that holding independent variables constant (green purchasing, green manufacturer/supplier collaboration, green distribution, reverse logistics) to a constant zero, supply chain performance would be at 33.298, a unit increase in green purchasing would lead to increase in supply chain performance by a factor of 0.865, a unit increase in green manufacturer/supplier collaboration would lead to

supply chain performance by factor of 0.768, a unit increase in green distribution would lead to increase in supply chain performance by a factor of 0.611 and unit increase in reverse logistics would lead to increase in supply chain performance by a factor of 0.603.

At 5% level of significance, green purchasing had a p-value of 0.001, green production had a p-value of 0.003, green distribution had a p-value of 0.006, and reverse logistics had a p-value of 0.007. Therefore, the most significant factor was green purchasing. The findings of this study collaborated with literature review byChau and chung (2010) who states that green procurement strategies which is the largest part of inbound logistics side was adopted by organizations to respond to the global concern of environmental stability.

Table 8: Regression Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	Constant	2.730	.953		2.865	.006
	Green purchasing	.865	.173	.558	4.950	.001
	Green Manuf/Supplier Collab	.768	.174	.438	4.397	.003
	Green distribution	.611	.192	.366	3.187	.006
	Reverse logistics	.603	.252	.326	2.391	.007

a. Dependent Variable: Supply Chain Performance

CONCLUSIONS

The study revealed that the variable statistically, strongly and significantly correlated to supply chain performance at five percent level of significance as it had a positive relationship with the dependent variable. This implied that the more green procurement increases the more it influences the supply chain performance. Therefore, from the qualitative and quantitative analysis, the findings showed that the research which sought to establish

the influence of green procurement on supply chain performance was achieved because it established that it influenced supply chain performance.

Additionally, the study revealed that the variable statistically, strongly and significantly correlated supply chain performance at five percent level of significance as it had a positive relationship with the dependent variable. This implied that the more green production increases the more it influenced

the supply chain performance. Therefore, from the qualitative and quantitative analysis, the findings showed that the research which sought to establish the influence of green production on supply chain performance was achieved because it established that it influenced supply chain performance

Further, the study revealed that the variable statistically, strongly and significantly correlated to supply chain performance at five percent level of significance as it had a positive relationship with the dependent variable. This implied that the more green distribution increases the more it influences the supply chain performance. Therefore, from the qualitative and quantitative analysis, the findings show that the research which sought to establish the

RECOMMENDATIONS

The study recommended for formal introduction of an environmentally friendly in purchasing process, integrated environmental concerns into to supplier assessment process, implement use of environmentally friendly process and designing of products that can minimize material and energy consumption. This can lead to enhancement of supply chain performance. Additionally, the organizations should formally introduce designing of products that minimize material and energy consumption, usage of material and parts that are reusable and recyclable, use of biodegradable

materials, alternative fuels, treatment and control of post combustion emissions and implement waste reduction measures in its production processes to boost supply chain perfomance.

Areas for Further Research

The green supply chain management and supply chain perfomance, has not been widely studied which presents gaps in African and Kenyan contexts. The study contributed to knowledge by establishing that green manufacturer/supplier collaboration, green purchasing, green distribution and reverse logistics influence supply chain performance in the humanitarian organizations in the Kenyan context.

This study used qualitative technique and it was also a cross sectional study and hence other studies using longitudinal design could be carried out to establish whether supply chain performance in the humanitarian organizations is actualized. Also, an exploratory study would enrich findings because such a study would have a wide range of factors that influence supply chain performance in the humanitarian organizations addressed other than the ones identified in this study. This study confined itself to the Kenya Red cross and a comparative study should be carried out to compare whether the findings also apply for the organizations in order to validate whether the findings can be generalized.

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