GREEN PRACTICES AND SUPPLY CHAIN PERFORMANCE OF GOVERNMENT HOSPITALS IN NAIROBI COUNTY

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DECLARATION

This is my original work and has never been submitted to any other University for assessment or Award of a degree

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D61/66129/2013

This research project has been submitted for examination with my authority as the supervisor.

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DEDICATION

I dedicate this research project to my loving daughter Abigail Mwendwa Kiruya , my parents; Mr. Stanley Mbaabu and Mrs. Jerusha Mbaabu ,my sister, Dr. Karen Mwaura her husband Mwaura and my brother Evans Munya for the tireless support they have offered me.

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ABBREVIATIONS AND ACRONYMS

BSC Balanced Score card

EIA Environmental Impact Assessment

EMAS Eco- Management and Audit Scheme

EMS Environmental Management Systems

EPP Environmental Preferred Purchasing

GDP Gross Domestic Product

GSCM Green Supply Chain Management

GSCP Green Supply Chain Practices

ISO International Organization for Standardization

3Rs Reduce Reuse Recycle

KEMSA Kenya Medical Supplies Agency

KPI Key Performance Indicators

RBV Resource Based View

MOH Medical Officer in-charge of Health

NEMA National Environmental Management Authority

NHIF National Hospital Insurance Fund

PPOA Public Procurement Oversight Authority

SCM Supply Chain Management

SCOR Supply Chain Operations Reference

WHO World Health Organization

ABSTRACT

A research was done to establish Green practices and performance of government hospitals in Nairobi County. The study had three research objectives namely; To what extent is Green supply chain practiced in Government Hospitals in Nairobi County, To determine the relationship between Green supply chain practices and performance in Nairobi County, To establish the challenges faced in implementing Green supply chain practices in Government Hospitals in Nairobi County. The research design used was a census survey, frequencies and percentages were used to analyse and represent objective one regression analysis was used to analyse the relationship between Green supply chain practices and performance of Government Hospitals. The research revealed that there is a significant relationship between green supply chain practice and performance. A questionnaire was used to collect data through drop and pick later method. Percentages and frequencies were used to analyse the first objective, while objective two and three correlation and regression methods were utilized. Findings from analysis of objective one indicated that most of the government hospitals in Nairobi had implemented a number of green supply chain management practices. The research centred on Government Hospitals in Nairobi County, as given by the Ministry of Health website. Results from indicated that Green supply chain practices are closely related to performance of supply chains. The study recommends that hospitals should empower and educate their employees on the importance of efficient waste management and reverse logistics approaches to enhance green supply chain.A major limitation of the study was that, it only studied Government health facilities within Nairobi County. Another limitation of the study was that, no highlight was done on suppliers' willingness to participate in green supply chain practices. Suggestions for further research would be to establish the impact of reverse logistics on efficient product consumption along the supply chain. Another area of future research will be to evaluate suppliers' willingness to conform to consumers' eco design, and its impact on performance.

CHAPTER ONE
INTRODUCTION

1.1 Background of the Study

The term green is currently used to represent the environmental, social and economic impact on a firm's activities (Rahimifard and Clegg 2010). Green supply chain management (GSCM) is an emerging field propelled by the need to be environmentally conscious (Srivastava 2011). Scholars and practitioners have recently developed interest in the science behind GSCM. Supply chain practitioners are using environmentally friendly knowledge to reduce waste and preserve the quality of product life and other utilities around the firm's premises (Guise and Srivastava 2011).

Karliener and Gautier (2009) observe that globally, public health related risks together with ecological challenges have emerged and become destructive than individual aspects. Ecological factors for example, climate change, unsustainable resource use, have fuelled ill heath in the globally. They continue to observe that; hospitals consume a lot of energy in a quest to serve a sick population. There are many elements that pose danger unknowingly to the populace. For example, intensive use of x-ray machines may produce emissions, improper disposal of lab waste, air pollution during incineration, heat emissions from computer use and other diagnostic tools.

Globally, countries like the USA have adopted a scheme, Environmentally Preferred Purchasing (EPP) that ensures the whole supply chain is *green (*Emmett and Sudd 2010). In the African context, sustainable development is crippled by factors like Poverty, Poor Governance, Corruption, and lack of appropriate frameworks (Economic Commission for Africa 2010).

Nixon (2011) observes that in Kenya in particular, strides have been made previously by the late Professor Wangari Maathai who championed for environmental justice and won a Peace price for her work in creating awareness of environmental conservation (NEMA2012). The Government of Kenya launched the Kenya Vision 2030; it highlights the development goals to be archived by the year 2030. The vision does not mention the use of environmental criteria to be used to observe green supply chain practices in public healthcare. The research thesis intends to determine the practices necessary for a green supply chain in public hospitals.

1.1.1 Green Supply Chain Management Practices

Gilbert (2009) observes that green the supply chain as the art of applying environmentally friendly criteria into the organizational procurement processes and other relationships with the suppliers. Previously, innovation was predominately driven by the focus on exceeding consumer's expectations and creating simpler processes. Recently, several organizations are required to respond to the community environmental conscious consumers that lead manufacturers to adopt environmental oriented practices (Nunes, 2008).

Zelbst (2012) noted that execution of GSCM practices is anticipated to yield in high environmental performance measured by reductions in air emissions, and other forms of waste. In addition, it has been observed that GSCM practices like recycling, repacking in environmental friendly packs helps avoid environmental degradation (Basu and Wright, 2008).

Zhu (2008) observed that , processes in Green supply chain practices include all supply chain activities ranging from green purchasing, later on incorporating

completer product life cycles from the manufacturer to the end user and ultimately including reverse logistics and waste management.

1.1.2 Supply Chain Performance

Hayfield and Nichols (2010), observe that performance in Supply chain is inclusiveness of supply chain processes that include both tangible and intangible factors, for example utilization factors (Chang, 2013). Evidence indicates that firms have used green SCM practices in an attempt to improve performance.

According to Beamon (1999) Supply chain performance can be viewed in three categories that are: resource related, output related and flexibility related. Gunasekaran and Patel (2004) classified performance metrics as strategic, tactical and operational. Hofmann and Locker (2009) observed that performance measurement includes financial and non- financial aspects. Lorentz (2012) observes that Supply chain performance, is an intra – firm measurement that goes beyond a firm's financial aspects and efficiency in customer satisfaction but rather considers conservation of the environment in the quest for profitability.

1.1.3 Government Hospitals in Kenya

Healthcare in Kenya has been guided by the health policy based on the country's Paper No. 10, which placed highly, the eradication of disease, poverty, and illiteracy as the main agenda (Kenya Health Policy Framework Paper, 2010).

The current organization of health system mirrors the administrative division of the nation. This is following the implementation of the devolved systems of governance that was promulgated on the 27th August 2010. Health system is thus organized around the 47 counties. Public healthcare facilities in Kenya are categorized into these categories (KEPI 2010):

Level 1- Comprises of community health services these facilities are mainly based within a community. Level2 - These facilities offer primary healthcare that include; blood pressure, sugar levels, check –ups, vaccinations and other basic clinical activities. Dispensaries are in this category. Level3 - These types of facilities offer primary healthcare with additional support. Some of them may offer in-patient services. Level 4 - Facilities are offer an array of services like surgical services, radiological treatment and other diagnostic and treatment based approaches. Level5 – In this cluster facilities are facilitated to offer medically advanced services that are accessible at lower facilities. Level 6 -These are at the apex of medical services they include national teaching referral hospitals. (MOH / GOK 2010)

1.2 Research Problem

Studies indicate that, a firm's GSCM practices have a significant impact on the conservation of the environment. Scholars, Su-Yol Lee and Zhu (2011) found that buyers and environmental requirements can compel a firm to abide with environmental regulations. Scholars have established that the above relationship of GSCM practices and performance may exist. Findings are not conclusive thus, necessitating more empirical research.

Su-Yol Lee (2008) studied on the participation of small and medium-sized suppliers in green supply chain initiatives in Beijing, China .The study revealed that, buyer's environmental requirements and support have a positive relationship with suppliers' agreement to participate in green supply chain implementation. The study was limited to a few regions in China; the results cannot be applicable to other regions due to various geographical differences and facility configurations.

Chiuou (2011) studied the impact of Greening the suppliers and Green Innovations on environmental Performance and competitive advantage in Taiwan. The scholar found out that, Greening leads to innovations and competitive advantage. Recently, Green Supply Chain has cropped up as a key player in the environmental conservation for various firms The main shortfall of the study was that, it focussed entirely on greening the supply chain. Literature indicates that greening alone cannot lead to competitive advantage

Links and Niveh (2008), did a study; to determine the impact of ISO certification of organizations on environment and business performance in Brussels, Belgium. They found out that ISO Certification in organizations led to better environmental performance. The study was only limited the effects of ISO certification on the performance of a firm.

In the Kenyan context, GSCM practices are fairly new. Some of the recent studies done in the area of GSCM may include; Yvonne (2013) studied on Green supply chain management practices and performance of pharmaceutical companies in Nairobi, Kenya. The study revealed that challenges to Greening practices are mostly due to ignorance by the stakeholders. The limitation in the study was that it only focussed on one aspect of health care; pharmaceutical department.

Babu (2011), did a study on, Green supply chain practices and operational performance of personal care manufacturing firms in Nairobi. The scholar found that a number of manufacturing firms subscribed to environmental auditing bodies like NEMA and KEBS. Despite the firms being environmentally audited by the Government bodies, this did not necessarily equate to implementing Green Supply

chain practices leading to firm performance. The major limitation of the study was that it focussed on large manufacturing firms.

Recently, NEMA has advocated for superior controls within the healthcare that conserve and manage the environment. Key directions are in the utilization of energy in an efficient manner. Environmental consciousness in healthcare may incorporate safe medical waste disposal, vigilant handling and management of all pharmaceuticals. Healthcare facilities in the country are adopting efficient measures to curb environment degradation in their facilities (Marege, 2013).

The level four and five public hospitals in Kenya have been characterized by many changes. The emergence of competitive forces such as, the entrant of new players, availability of substitute products, and supplier and increased purchasing powers of consumers have impacted on firms' desire to remain competitive and relevant in the market hence adopting Eco Friendly practices have been crucial (Moragwa, 2013.

Finally it is key to bring to light that , green supply chain practices are necessary to firm performance, this research study desired to answer the question; what is the relationship between green supply chain practices and performance in government hospitals in Nairobi County. Other research questions that were answered are:

What is extent of, green supply chain practices and performance in government hospitals in Nairobi County?

What is the relationship between green supply chain practices and performance in government hospitals in Nairobi?

What are the challenges of implementing green supply chain practices in government hospitals in Nairobi?

1.3 Research Objectives

The overall objective of the research was to determine the relationship between Green Supply chain practices and performance in Government hospitals in Nairobi County. The specific objectives are:

i. The extent Green supply chain is practiced in Government Hospitals in Nairobi County.
ii. To determine the relationship between Green Supply chain practices and performance in government hospitals in Nairobi County.
iii. To establish the challenges of implementing Green supply chain practices in Government Hospitals in Nairobi County.

1.4 Value of the Study

On contribution to theory, it is observable that Healthcare industry in Kenya is an integral part of the Kenyan economy. The variables in the study have not received exhaustive interrogation in area of procurement and supply chain management literature. It is anticipated that the findings of the research shall contribute to the existing knowledge in the currently growing field of Green supply chain management. This has been augmented, by providing a clear reflection of the effects between practices of Green Procurement, Reverse Logistics, Green Packaging, Eco design and Waste on the management in healthcare supply chains. The area is yet to be fully explored by scholars and replicated in future studies especially in the health care industry in Kenya. Hence the study, is relevant to support future research in areas that have not been comprehensively been covered by the current research.

On Policy development, the study seeks to provide knowledge to the industry regulators and government policy makers. To the extent in which laws and policies affecting Green Supply Chain Management in Health Supply chains, can be effectively implemented and religiously adhered to. Findings from the paper are expected to benefit policy makers, identify various opportunities arrived by executing well informed policies on GSCM practices in healthcare. The main aim being, to amend existing polices on environmental conservation target on improving existing GSCM policies. Consumers of healthcare services ideally, prefer services of Healthcare institutions that have components of Greening in their supply chains. This enhances quality service delivery, fewer mortality rates, saving of costs and ultimately a healthy nation as postulated in Kenya's vision 2030.

On Practice, the research is of importance in the sense that it will act as an authoritative tool for Procurement and supply chain managers involved in Healthcare industry who believe in continuous improvement by adapting to newer Supply chain practices away from the traditional view. The paper shall provide business organizations, with useful environmental information on Green Supply Chain practices as applied to health industry. The framework shall also be useful to practising procurement and supply chain managers develop measurement parameters to assess a firm's position in competitive advantage when implementing GSCM practices. Implementing of suggested GSCM practices in firms by managers will elevate a firm's performance on being environmentally conscience and attracting and retaining of more consumers that desire green oriented products, eventually, medical products shall be repackaged to conform to various environmental requirements, translating to prosperity of firms through profits and competitive advantage.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter highlights on the theoretical foundation of Green supply chain practices and performance. It further discusses research gaps and provides a conceptual framework for the study.

2.2 Theoretical Foundation

The research was informed by Resource Based view, Resource dependence and institutional theory. These theories are relevant in explaining the usefulness of firms' resources and ways resources available to the firm can be utilized for competitive advantage.

In the research, the link between Green supply chain practices and performance would be effectively be rationalized by Resource Based view. Other theories that shall be incorporated include; Resource dependence and Institutional theories.

2.2.1 Resource Based View

The theory argues that sustained, competitive advantage and improved performance by a firm could be achieved by exploiting resources available, valuable and rare and non- substitutable (Barney et al, 1991). A rare resource or bundle of resources is one that is not possessed by a large number of firms. A non-substitutable resource or bundle of resources is one for which an equivalent resource cannot easily be created by competing firm or firms. An imperfectly imitable resource or bundle of resources is one that is difficult to replicate or one that can be replicated at a significant cost (Barney, 1991& Hart, 1995).The theory has been previously used by scholars like Markley and Davis (2009) to examine creative strategies used by Supply chain

management practices and capabilities as resources that can be employed in guidance form that encourages the implementation of green practices in the firm's supply chain to improve on firm and environmental performance.

Almost all organizations are at a point where their business operations impact in one way or the other on the natural environment (Esty& Winston, 2009). RBV in the context of environmental responsibility will require firms to employ strategic resources and capabilities to create unique and difficult to imitate practices that will lower the effectiveness of a firm's operations on the natural environment (Cheng, and Tang, 2010). Hart (1995) refers to this resource as the natural resource. The theory is useful in underlining the competitive advantages that firms can adopt in adopting resource based view perspectives.

2.2.2 Resource Dependence Theory

This theory stems from out of the assumption that very few firms if any are self-sufficient with respect to all resources, this leads to dependence on other firms (Heide, 1994). The theory explains that organizations have exchanges with their environment in order to acquire resources. An organization's critical resources span beyond it boundaries, exemplary performance cannot be attained without support of the suppliers. The resources that organizations seek by building relationships with partner organizations include monetary and physical resources, information and social legitimacy (Davis and Cobb, 2009).

(Zhu and Lai 2010) assert that, in the Green Supply Chain Management, high level collaboration is essential in the management of internal and external coordination .The utmost idea being to have a fully functional system implemented in the whole supply chain. To adopt efficient and effective Green Supply Chain Practices like:

Green Procurement, Eco design, reverse logistics and waste management and Reverse Logistics, firms require to have well established internal environment management and a streamlined external collaboration with its suppliers and consumers (Taticchi and Cagnazzo 2010)

Slowinski, (2011) observes that Resource dependence theory is relevant to Green Supply Chain Management by noting that, an organization can strive for closer relationship with its resource provider as merger; to offer Green products and synchronize their supply chain to adopt only Green based processes and hence improving on competitive advantage. According to the interdependency assumption, predictions can be interrupted by changes in the environment, for example, major market shifts, changing government regulations, and commodity price changes (Slowinski et al., 2009)

2.2.3 Institutional Theory

The theory provides a basis through which researchers can identify and examine influences that promote survival and legitimacy of organizational practices including factors like culture, social environment, regulation (including the legal environment) while acknowledging that resources are equally important. (Baumol, Di Maggio and Powell, 1983).The theory is aptly used to explain, how changes in social values, technological advancements and regulations affect decisions regarding *green* sustainable activities (Ball and Craig, 2010).

Institutional Theory composes of three drivers that create isomorphism in organizational strategies, structures and processes. The drivers are: coercive, normative, and mimetic (DiMaggio and Powell, 1983). Coercive occurs from

influences exerted by those in powerful positions, in this case within the healthcare supply chain. Coercive pressures are crucial to drive environmental management and hence sustainability (Kilbourne 2002). The normative drivers certify that organizations are in agreement with order. Ball and Craig (2010) view normative pressures as being more environmentally aware, and insist that more empirical knowledge is required to understand various social rules that have emerged in connection to performance .Ball and Craig (2010) argue that, the processes are necessary in managing a firm's green supply chain to conform to green attributes that conserve the environment.

2.3 Green Supply Chain Management Practices

Green supply chain management practices can be defined as the connection of a firm's organizational goals, business processes within the supply chain to the main objectives, in line with conservation measures aimed at achieving environmentally sound products and services. (Wu and Dunn, 2012).

2.3.1 Green Procurement

Brenner (2010) points out that the focal point of green procurement is to eradicate waste early in the supply chain, through carefully considered procurement processes that are bound by green related principles. Muller (2011) viewed that, green procurement has various benefits, the best of them being that green procurement processes not only attracts reusable products but also reduces unnecessary costs of moving potentially toxic items within the supply chain .

Singh (2011) observed the cooperation between suppliers and buyers would necessitate social commitment and commercial efficiency of acquisition and procurement of raw materials to be used by the firm.

According to Min H and Galle (2011) observed that, implementing a green purchasing policy, often does not require any organizational changes by the contracting authority. They further indicated that, in order for the policy to be implemented strategic planning, procurement employee training, access to environmental information and setting priorities are mainly required.

McKone-Sweet, K., Hamilton, P. and Willis, S. (2012), agree that when procuring for Hospital and medical products, certain parameters need to be enforced. These may include; inspection of presence of latex, PVC and other toxic substances in medical /surgical consumables. For medical hardware, it was observed that life endurance, energy endurance, spare part cost and the total financial and environmental impact be critically assessed. The scholars also noted that, procurement of foods stuff for hospital consumption should have least amount of food preservatives. Foods containing pigments and other aromatic substances should be avoided due to their limited shelf life.

2.3.2 Eco Design

Eco design revolves around consideration of design, format and outlook relevant to environmental safety and health of the product cycle during new production and process development (Rao2008).

According to Kriesburg (2009) healthcare consumables can be modified to be ecological sensitive; this may include, being biodegraded quickly, more efficient in lower doses, packing in bio gradable packaging is also key. It was recommended that the shelf life could be brought closer to align with real time by refining the expiring dates.

Kriesburg (2009) also observed that, in terms of medications packing, recyclable materials can be used by adding more information on proper method of disposal. The packaging can also include shapes and sizes that would be appropriate for transport and returning for economic benefits.

2.3.3 Reverse Logistics

The process involves careful well coordinated product inventory of both consumers and point of origin. Main goal is to establish a clear approach in the reuse of products while capturing value in the flow of goods (Xie and Breen, 2012).

An increasing number of organizations in developed nations in, Europe, America and Australia engage in voluntary or mandatory end-of-life product management. These developments have a great impact on environmental and economic values. (Geyer and Jackson (2009).

Khisa (2011) observed that regionally, parts of Southern Africa, Kenya, Rwanda, Uganda and Tanzania are catching up in developing policies that aim at improving product reusability once it has gone through the complete supply chain.

2.3.4 Waste Management

Healthcare waste management includes all activities involved in waste generation, segregation, transportation, storage, treatment and final disposal of all types of waste generated in the healthcare facilities, stages of which require special attention. This will ensure that inputs (funds, equipment and facilities), activities and outputs (safe workplaces, healthy environment, healthy workers) for the safe handling and disposal of healthcare waste are in place (Sarkis, 2010).

Healthcare facilities consume quite enormous amounts of energy, water and other resources. The consumption produces an assortment of waste that includes; glass, cardboard, bio- wastes, food, hazardous pollutants, heavy metals, radioactive materials and cyto-toxic drugs (Drake, 2011).

Zhu (2012) and Bohlen (2013) noted that health facilities can cut waste and emissions through composting, recycling, better purchasing for example minimizing packaging, using reusable rather than disposable products, and buying recycled products, also including the minimizing of waste transport local treatment and disposal.

2.4 Supply Chain Performance

According to Falcons (2010) the balance score card has four main areas of measurement. The four areas are; the Customer perspective that measures values addition for its customers. The customer metrics are; the value through time, quality, performance, service and cost. Consumer based metrics have to be merged with organizational approaches to customer demands.

2.5 Green Supply Chain Management and Supply Chain Performance

Globalization of business operations has resulted in increased value chain requirements for environmental-friendly operations. Recent among the directions include development of green supply chain management (GSCM) in countries that are have superior economies and cascading down to other countries (Zhu, 2012).

Chiou (2011) examined the association between greening the supplier and green innovations in electronic firms in Taiwan. The researcher concluded that, greening the supplier through green innovations leads to great benefits in environmental performance and competitive advantage of the firm.

Sarkis (2012) evaluated the effectiveness of GSCM in a Chinese manufacturing enterprises and the automobile industry respectively. DeBorito (2013) did a survey on the impact of green initiatives in the fashion retail supply chain organizations and its performance. The scholar found out, that green issues on fashion industry were fluid, affected by other factors that include; high competition, high utilization of resources and labour practices.

2.6 Summary of Literature Review and Knowledge Gaps

Literature reviewed indicates that the main focus of firms have been on profit maximization and efficient processes for maximization of shareholder wealth. Literature suggests that green supply chain practices have a direct link to the performance of organizations. Studies on GSCM practices in Government Hospitals, are not conclusive hence the need for mores empirical studies that indicate the link between GSCM and performance in Government Hospitals.

2.7 Challenges of Implementing Green Supply Chain Management Practices

According to Wilkerson (2008) majority of firms implementing green supply chain practices rarely integrate environmental approaches into their supply chain processes. Insufficient information on best practices for green supply chain and related metrics have left organizations handicapped on what to do and implement (Cognizant, 2008).

Concept of Green Supply Chain is relatively new in areas like, South East Asian countries few of them have been able to implement it. (Chau 2010). The scholar also observed that, there is need for more studies in this sector due to the “End-of- pipe” approach. Rao (2011), in his study on green supply chain in South East Asia region,

found out that more and more manufacturing companies are gaining an interest in implementing Green supply chain practices.

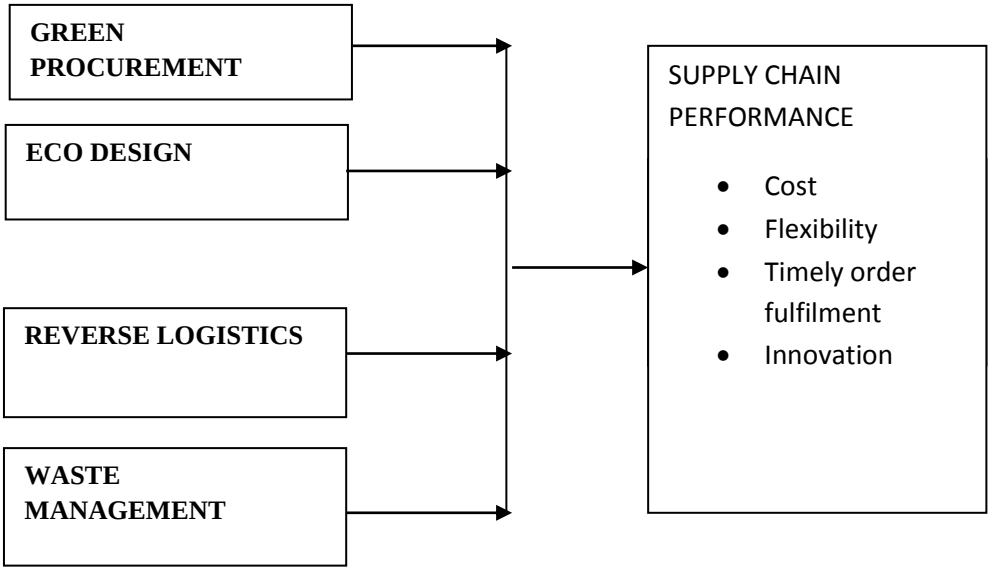
Implementation of GSCM has always been challenge in African Region especially in East Africa. Organizations face challenges, which include: Lack of current technology and technical expertise. Technological efficient solutions that have a more favourable impact on the environment (Muchiri, 2011).

2.8 Conceptual Framework

This is a representation of the conceptualized relationship between the variables in the study. Green Supply chain Practices is the independent variable, while Supply chain performance is the dependent variable.

GREEN SUPPLYCHAIN MANAGEMENT PRACTICES

Independent variables **Dependent variables**



Source: (Researcher 2016)

Figure 2.1 Conceptual Model

Green supply chain management practices are anticipated to have a bearing on the supply chain performance of a firm when efficiently executed. Effective outlines on specifications of paperless procurement practices is expected to improve the quality of Green procurement is anticipated to bring in quality, environmentally friendly goods and services into the supply chain and eventually have a good performance on other aspects of the supply chain that includes reverse logistics and waste management in general.

Proper implementation of reverse logistics is expected to improve on efficient minimisation of waste, rejected, faulty, non-functional items that most commonly pollute the environment when not properly disposed back into the supply chain through reverse logistics processes.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The chapter depicts the research methodology used. This includes the research design, target population, sampling design, data collection and data analysis techniques used for data analysis.

3.2 Research Design

Research design used for this study was descriptive census survey. According to (Salaria, 2012) descriptive research is devoted to the gathering of information about prevailing conditions or situations for the purpose of description and interpretation.

3.3 Population

The population was all Government healthcare facilities in Nairobi County. The study relied on the health survey report (2012) that indicated that there were 72 Government Health facilities in Nairobi County (appendix ii) .The study carried out a census; this is because the population was not too large.

3.4 Data Collection

Data for the research was obtained from primary and secondary data sources. Secondary data was got from annual (GOK/MOH) reports. Primary data was collected through a semi - structured questionnaire that was administered through a "drop and pick later" method, to the manager in-charge of procurement or his/her equivalent. The questionnaire had three parts; part A covered general information of the respondent, part B dealt with the extent to which GSCM practices affect supply chain performance in Government Hospitals in Nairobi County, and part C was to

determine the relationship between GSCM practices and performance in Government hospitals. Part D dealt with the challenges that inhibit implementation of GSCM practices in Government hospitals in Nairobi County. The questionnaire was in the form a 5point Likert scale; respondents were required to indicate their response on a scale of 1 to 5.

3.5 Data Analysis

The data gathered was analyzed using correlation, regression and descriptive statistical analysis. This enabled the investigation of more than two variables at once. Frequency proportion was used to determine the extent of adoption of the GSCM. The statistical package for Social sciences (SPSS) was used as the main software to analyze the data. The following regression analysis equation was used to analyze the relationship between Green practices and supply chain performance of Government Hospitals in Nairobi County. Data on the level of relationship between GSCM practices and Performance in Public Hospitals was represented the following equation:

$$Y= \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \varepsilon$$

Where Y=Supply Chain Performance (SCP)

X_1 =Green Procurement

X_2=Eco Design

X_3=Reverse logistics

X_4=Waste Management

β_0 = the constant Term

ε = Error term

The table below gives a summary of the various data collection and data analysis methods used

Table 3.1: Summary of Data Analysis methods used

Objectives	**Questionnaire**	**Data Analysis**
General Profile	Section A	Descriptive statistics
Objective 1	Section B	Descriptive statistics
Objective 2	Section C	Correlation and Regression Analysis
Objective 3	Section D	Descriptive statistics

Source: (Researcher, 2016)

CHAPTER FOUR: DATA ANALYSIS PRESENTATION AND DISCUSSION

4.1 Introduction

The study was carried out to establish, green supply chain practices and performance of Government hospitals in Nairobi County. The units of measurements used to present the findings were, percentages, frequency distribution, mean and standard deviation. Data was collected from the in-charge procurement and their equivalent in health centres anddispensaries.

4.2 Response Rate

Of the 72 questionnaires distributed a total of 58 were returned. This indicates an 80% response rate which was considered sufficient enough for analysis. Sakaris (2012) notes that a response rate of about 70% is sufficient to represent the responses of a large population especially when dealing with cross sectional data.

4.3 General Information

General information about the respondents was sought this was necessary to establish the duration the respondents worked at a facility. The objective was to establish, the level of experience in supply chain management that the respondents had been involved in.

The study results as represented in the table indicate that 16% n=12 had worked in the supply chain department between 5 and ten years 35 of the respondents had worked in the facility above ten years, 25 respondents having worked in the facility for above ten years. This indicates that a majority of the respondents have heard of Green practices in supply chain management.

Table 4.3.1: Working duration at the facility

Period	Frequency	Percentage
Under 5 years	12	16.7
5-10 years	35	48.61
Above 10 years	25	34.72
Total	72	100

Source: Research Data (2016)

4.4 Current Job Designation

Respondents were asked about their current job designation. Results indicated that 17 were purchasing clerks. While 18 respondents were purchasing officers, and 32 were procurement manager. Based on the previous question we observed that, few respondents have moved up the ladder to become procurement officers and managers respectively and were able to clearly implement Green practices in their supply chains.

Table 4.4.1: Current Job Designation

Job designation	Frequency	Percentage
Purchasing /stores clerk	17	23.61
Purchasing /Supply chain officer	18	25
Procurement /Supply chain manager	32	44.4
Other (specify)	5	6.94
Total	72	100

Source: Research Data (2016)

4.5 Green Supply Chain Management Practices

The study sought to seek the respondent's level of agreement towards knowledge of the following green supply chain management practices.

From the results it emerged that, most facilities had effected measures on monitoring goods enter the supply chain conform to green related procurement. The score of 3.172 indicated that standards relating green procurement were followed.

The study also revealed that a majority of facilities considered a product's maximum utilization within the supply chain before purchase. The results yielded a score of 3.241 which were considered to be average.

Table 4.5.1: Extent to which the Facilities Practiced Green Procurement

Green procurement	Mean
The health facility has set Green standards for acquisition of products and services.	3.172
The management considers a product's lifecycle cost before purchase?	3.241

Source: Research Data (2016)

4.5.1 Extent to Which the Facility Practiced Eco Design

The research sought to find out the whether the packed in environmental standards were less tampered with. A mean score of 3.09 emerged this indicated that environmentally friendly packaging reduces tampering of products this proved to be effective in conserving the environment.

It was also found that environmentally friendly packing facilitated good storage a mean score of 2.88 emerged. This indicated that a lot requires to be done to provide more effective packaging practices.

Table 4.5.2: Extent to which the Facility Practiced Eco Design

Eco design	**Mean**
Environmentally packaging has reduced levels of tampering during transportation	3.09
Improved environmentally friendly packaging has enabled proper storage.	2.88

Source: Research Data (2016)

4.5.3 Extent to which the Facility Practiced Reverse Logistics

The study wanted to find out the extent of reverse logistics practiced. Mean score of 3.29 emerged. This was clear that a majority of facilities practiced reverse logistics. There also came out that, general operating costs had been reduced, this was reflected by a mean score of 3.34, which was considered to be above average.

Table 4.5.3: Extent to which the Facility Practiced Reverse Logistics

Reverse logistics	**Mean**
To what extent are there procedures on product return policies?	3.29
There is reduced operating costs from the reuse of recovered products and components	3.34

Source: Research Data (2016)

4.5.4 To what extent is waste management practiced at the facility

Results on waste management practices yielded a mean score of 2.78; this indicates that waste management practices had a relevant effect on reducing environmentally related accidents. This value was considerably lower that of reduction of environmental degradation that had a mean value of 2.929. This meant that, few accidents were experienced and more the environment was conserved more.

Table 4.5.4: To what extent is waste management practiced at the facility

Waste management	Mean
There are reduced environmentally related accidents due to proper management of waste.	2.78
There is reduction of environmental degradation due to well labelled refuse bins	2.929

Source: Research Data (2016)

The study revealed that green procurement was highly practices and yielded a mean score average of 6.413 this indicates that green procurement was highly active in most facilities.

Eco design was not highly practiced this is because most manufacturers were not conversant with environmentally friendly packaging that is currently acceptable in health facilities. This yielded a response rate of 2.985 collaborated with Rao (2008)

who found out that systematic considerations are considered for overall health, and environmental impact ,in addition to the ability of a product to go through whole product life cycle in the supply chain .

Reverse logistics is efficient in most facilities, it was observed that products were effectively returned back in to the supply chain. Responses indicated a mean score of 3.315. The results concede with Khisa (2011) who found that in African region, reverse logistics in African countries is catching up and policies are being to encourage product reusability.

Waste management practices have not been properly absorbed into the green supply chain of most facilities. This indicates room for more education on management of used material and products that are to be discarded efficiently without damaging the environment. The results contradict Zhu (2012) and Bohlen (2013) who found out that, health facilities can cut costs by only recycling, better purchasing rather than using disposable packaging materials.

Table 4.6: GSCM and Their Average Response Rate

SUMMARY OF GSCM PRACTICES	
GSCM Practice	**Mean Score**
Green Procurement	6.413
Eco Design	2.985
Reverse Logistics	3.315
Waste Management	2.85

Source: Research Data (2016)

4.6 Supply Chain Performance

The study sought to find out the respondent's level of knowledge on cost as supply chain performance indicator.

According to the findings, cost reduced from adoption of green procurement policies with a mean score of 3.121. Reduced wastage, had a mean score of 2.82, with eco design was considered to reduce environmental emission with a mean score of 3.5. Overall the results indicated that, most government hospitals in Nairobi County had ensured reduction on costs a measure of good supply chain performance.

Table 4.6.1: Performance of Supply Chain in Regard to Costs

Cost	**Mean**
There are reduced costs on adoption of green procurement policies.	3.121
There reduced wastage due to effective reuse of packaging	2.82
Eco designed products have reduced toxic emissions to both customers and the facility.	3.500

Source: Research Data (2016)

4.6.2 Performance of Supply Chain in Regard to Flexibility

The study sought to find out the level of agreement in relation to flexibility as a supply chain indicator of performance.

Findings revealed that green practices had enabled faster information sharing with a mean score of 3.5. Respondents also were in agreement with a response mean score of

3.121 that green practices had reduced on lead time in customer order fulfilment. This indicates that flexibility as a measure of green supply chain is effectively handled to enable efficiency in the supply chain.

Table 4.6.2: Performance of Supply Chain in Regard to Flexibility

Flexibility	**Mean**
Green practices have enabled faster information sharing in the supply chain.	3.500
Green practices have led to a reduced lead time in customer order fulfilment	3.121

Source: Research Data (2016)

4.6.3 Performance of Supply Chain in Relation to Innovation

The study sought to find out on innovation and its impact on green supply chain management. From the findings green practices led to better performance with a mean of 3.362, greening the supply chain led to increased material and capability with a mean score of 3.759.The results, point to implementing green activities within the supply chain as having the highest impact on green supply chain performance.

Table 4.6.3: Performance of Supply Chain in Relation to Innovation

Innovation	**Mean**
Green practices have led to better performance through innovative processes.	3.362
Greening the supply chain has led to increased material handling and process capabilities.	3.759

Source: Research Data (2016)

4.7 Relationship between Green Supply Chain Practices and Supply Chain Performance

The study was also interested in determining the relationship there could be between Green supply chain practices and performance among Government health facilities in Nairobi County. The research utilized a linear regression analysis model to outline the expected relationship between the variables;

$Y=\beta_0 +\beta_1 x_1 +\beta_1 x_2 +\beta_3 x_3+\beta_4 x_4 +\varepsilon$

Where Y, stood for supply chain performance and X_1 =Green Procurement

X_2=Eco Design X_3=Reverse Logistics, X_4=Waste Management, B_0 = the constant Term and ε = Error term

All four variables were tested in relation to responses got from respondents .The results are explained below;

Table 4.7.1: Model of Coefficients

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.424	.680		3.563	.001
	GREENPROCUREMENT	-.170	.153	-.141	-1.109	.273
	ECO DESIGN	-.024	.131	-.024	-.186	.853
	REVERSE LOGISITICS	.745	.166	.583	4.501	.000
	WASTEMANAGEMENT	-.074	.148	-.065	-.500	.620

a. Dependent Variable: SUPPLY CHAIN PERFORMANCE

The model found the following equation, to explain the relationship between Green Supply chain management and Supply chain performance in Government Hospitals in Nairobi; $Y=2.42-0.24_{x1}-1.7_{x2}-0.74_{x3}+0.745_{x4}$

The regression model illustrates that, when all variables are at zero(constant) reading of supply chain would be 2.42.When all conditions are constant, a unit increase in eco design would lead to a decrease of -0.24,an increase in supply chain performance would lead to a decrease of -1.7 in eco design , an increase in supply chain performance would lead to a decrease of -0.74 reading in reverse logistics , and an increase in supply chain performance would lead to an increase of 0.745 in waste management. This indicates that there is a positive relationship, between supply chain management and waste management p=0.005.

This shows that, waste management is a suitable predictor of Y. This means that for every unit increase in measure of waste management and performance, the measure of performance increases to 0.745

The variables were measured according to the responses from respondents, the results are illustrated below

Table 4.7.2: Coefficient of Determination, R^2

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.560[a]	.314	.259	.98983

a. Predictors: (Constant), REVERSELOGISITCS, ECODESIGN, GREENPROCUREMENT, WASTEMANAGEMENT

The results from the table indicate, there is an R^2 of 31.4 %. This value indicates the four independent variables that explain 31.4% variance in the Green practices and performance of Government hospitals in Nairobi County.

Table 4.7.3: ANOVA

MODEL	SUM OF SQUARES	df	Mean square	F	Sig
Regression	22.393	4	5.598	5.714	0.005[a]
Residual	48.988	53	.980		
Total	71.382	57			

a. predictors (constant)Eco Design, Green Procurement, Reverse Logistics, Waste Management

b. Dependent Variable: Supply Chain Performance

ANOVA was used, to establish and explain the significance of the regression model, where by a significance of $p<0.005$ was established. This revealed, the regression model is statistically significant in explaining the effects of Green supply chain practices on Green supply chain performance.

4.8 Challenges faced in Implementing Green Supply Chain Practices

The study sought to find out the challenges faced while implementing Green supply chain management practices. The table below indicates the results.

Based on the results, poor planning had a mean score of 3.345, inadequate commitment by top management had 3.379, lack of proper technology had 3.479, lack of clear policies, had 3.690, existence of corruption had 3.621, bureaucracy as a factor had 3.776, lack of human capacity had 3.7.07.

From the findings, the most challenging aspect in implementing green supply chain practices was the lack of human capacity that revealed the highest score of 3.707. The findings collaborate with Yvonne (2013), who observed challenges of executing excellent Green supply chain management practices was due to lack of information by pharmaceutical companies .

Table 4.8: Challenges Faced in Implementing Green Supply Chain Practices

Challenges	**Mean**
Is there poor planning of green sustainability programs?	3.345
In adequate commitment by the top managers.	3.379
Lack of proper technology required	3.479
Lack of clear policies and communication to the employees.	3.690
Suppliers are reluctant to configure their products to meet recommended Green standards.	3.569
Existence of corruption among decision makers	3.621
There currently exists a lot of bureaucracy to authorize implementation.	3.776
There is a lack of human capacity and knowledge to implement.	3.707

Source: Research Data (2016)

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This study was done to establish the relationship between Green supply chain practices and performance of Government health facilities in Nairobi County. The research had three objectives; to determine the extent of Green supply chain practices in Government Hospitals in Nairobi County, to determine the relationship between Green Supply Chain Practices and Supply Chain Performance of Government Hospitals in Nairobi, and to establish the challenges faced in the implementation of Green Supply Chain practices in Government hospitals in Nairobi County.

This chapter presents a summary of findings for the three objectives mentioned, the conclusions, limitations recommendations made based on the research findings and suggestions for future research.

5.2 Summary of Findings

The study established that Government through the Ministry of health has mandated all its health facilities in Nairobi County to practice Green supply chain practices. This is in line within Moragwa (2013) who observed that configuration of competitive forces and intensity has enabled Government Hospitals in Kenya adopt Eco-friendly practices.

The research also established that there is a positive relationship between green supply chain practices and supply chain performance .This means that, green practices can assist in; saving costs through effective green procurement policies, reduced environmental degradation through adoption of eco-friendly practices, efficient

product reuse through adequate reverse logistics measures and proper waste management practices. This supports Chiuou (2011) findings whereby the scholar found that employing green based activities lead in the supply chain leads to innovation with high competitive advantage.

The main challenges cited by respondents in regard to practicing green practices were; lack of continuous refresher education on green practices, insufficient technology and technical skills to support greening processes in their facilities .This finding was similar to Babu (2011) whose findings revealed that despite firms being continuously being audited by environmental bodies like NEMA ,there still lacks appropriate number of technical support team on the ground to execute relevant environmental policies .

Findings revealed that among the variables utilized in the study, green procurement requires massive improvement, to enable efficient movement of Green oriented products within the supply chain.

5.3 Conclusion

The study concludes that there is need for continuous education especially for workers in levels 1, 2 and 3 health facilities on the importance of Green supply chain practices. Implementation of elaborate Green supply chain practices shall bring about competitive advantage. This is supported clearly by the regression analysis regression model showing a strong relationship between Green Management practices and performance.

5.4 Recommendations from the Study

Based on results from the research it has been observed that efficient Green supply chain practices enhance optimum performance in organizations. The study recommends that lower level health facilities be equipped with technical and practical knowledge on how to implement Green practices in their supply chains.

5.5 Limitations of the Study and Areas of Further Research

The study focussed on Government Health facilities in Nairobi County, findings should not be generalized to other counties due to the various approaches that there could be present in implementing green supply chain practices. More empirical studies are required on the effect of supplier's participation of Green supply chain management activities.

Areas of further research would be on the impact of reverse logistics on efficient product consumption along the supply chain. Another area of future research will be to evaluate suppliers' willingness to conform to consumers' eco design, and its impact on performance.

REFERENCES

Abuko, A.A. (2011).The Impact of GSCM on the Performance of Oil Companies in Kenya. *Unpublished MBA project,* UON.

Allen Hu, Chia-Wei Hsu (2010). Critical factors for implementing green supply chain management practices. *Management Research Review*. 33(6)586-608.

Beamon, B. (2009). Measuring Supply Chain Performance. *International Journal of Operations and Production Management,* l19 (3&4), 275-92.

Bowen, F.E., Cousins, P.D., Lamming, R.C. and Faruk, A.C. (2001). "The role of supply Management capabilities in green supply." *Production and Operations Management,* 10 (2), 174-89.

Chau, C.K., Chung, K.Y., Tse, M.S. (2010). "A choice Experiment to Estimate the Effect of Green Experience on Preferences and Willingness to Pay for Green Building Attributes "Building and Environment, 45 (11) 25,53-61.

Chege, E. (2012). Green supply chain management and supply chain performance of private hospitals in Kenya. *Unpublished MBA Project,* UON.

Chen, Y., Lai, S., and Wen, C. (2006). The influence of green innovation performance on corporate advantage in Taiwan. *Journal of Business Ethics,* 67(4), 331-339.

Eltayeb, T. K. &Zailani, S.H.M., (2011). "Greening Supply Chain through Supply Chain Initiatives towards Environmental Sustainability".

Farahani, R.Z., Rezapour, S., Drezner, T. and S. (2014). "Competitive supply chain network design: an overview of classifications, models, solution techniques and applications," Omega,. (45), 92–118,

Gopal P.R.C, Jitesh T. (2012). "A review of supply chain performance measurement" *International Journal of productivity and Performance Management*, Emerald Article.

Hagelaar, L. F. and Van der VorstJ. G. A. J. (2001) “Environmental supply chain management: using life cycle assessment to structure supply chains,” International Food and Agribusiness Management Review,.4,.4,.399–412,2001

Handfield, R. Sroufe, R. and Walton,S. (2005) “Integrating environmental management and supply chain strategies,” Business Strategy and the Environment,(.14),.1–19.

Hervani & Sarkis (2008). “Performance measurement for green supply chain management benchmarking”.

Khalfan, M.M.A., McDermott, P., Swan, W. (2007). "Building trust in construction projects", *Supply Chain Management: An International Journal*, 12(6).385-91.

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

Kubokawa, S. and Saito, I. (2000). “Manufacturing management strategies for environmental protection: toward the environmental upgrading of management and manufacturing systems to cope with environmental laws,” Production Planning and Control, (11). 107–112,

Kurk, F. and Eagan, P. (2008) “The value of adding design environmental pollution prevention assistance options,” *Journal of Cleaner Production*, (16) 6,.722–726.

Li, X. and Wang, Q. (2007), “Coordination mechanisms of supply chain systems,” European Journal of Operational Research, (179), 1, 1–16.

McCurry, M., Moore, V., Kane, G. and Ledlow, G. (2009). “Sisters of Mercy Supply Chain”.

McKone-Sweet, K., Hamilton, P. and Willis, S. (2012). “The Ailing Healthcare Supply Chain: A Prescription for Change”. *The Journal of Supply Chain Management*, 4-17.

Michel, P. Philippart, M., Verstraete, C., and Wynen, S. (2008). *Collaborative sourcing: Strategic value creation through collaborative supplier relationship management*. Louvain-la-Neuve: UCL.

Min, H. and Galle, W. P. (2011). 'Green purchasing practices of US firms', *International Journal of Operations and Production Management*, 21(9), 1222-1238.

Mirhedayatian, S. M., M. Azadi, and Sean, R. F. (2011), "A novel network data envelopment analysis model for evaluating green supply chain management," International Journal of ProductionEconomics,.147,.544–554.

Mugenda, O. M., & Mugenda, A. G. (1999). *Research Methods*: Quantitative and Qualitative Approaches. Nairobi, Acts Press.

Ngechu. M. (2004). *Understanding the research process and methods*. An introduction to research methods. Acts Press, Nairobi.

Rao, P. (2008). 'Greening the supply chain: a new initiative in South East Asia', *International Journal of Operations and Production Management*, 22(6), 632

Sarkis, J. L. M. Meade, and TalluriS. (, 2004) "E-logistics and the natural environment," Supply Chain Management, (9), .4, .303–312.

Srivastava, S. K. (2007) "Green supply-chain management: a state-of the-art literature review," International Journal of Management Reviews, (.9),1,.53–80

Taticchi, P. Tonelli, and Cagnazzo L. (2010). "Performance measurement and management: A literature review and a research agenda" Measuring Business Excellence, 14.

Wanjau, K. N., Muiruri, B. W., & Ayodo, E. (2012). Factors Affecting Provision of Service Quality in the Public Health Sector: A Case of Kenyatta National Hospital. *International Journal of Humanities and Social Science*, 114-125.

Waters D. (2010). *Introduction to Supply Chain Management*, (2rd Edition*)*, Palgrave, Macmillan, UK.

Zheng, L. and Zhang, J. (2010). " Research on green logistics system based on circular economy," Asian Social Science,(.6).116.

APPENDICES

APPENDIX I: INTRODUCTION LETTER

UNIVERSITY OF NAIROBI
SCHOOL OF BUSINESS

Telephone: 020-2059162
Telegrams: "Varsity", Nairobi
Telex: 22095 Varsity

P.O. Box 30197
Nairobi, Kenya

DATE 5/9/2016

TO WHOM IT MAY CONCERN

The bearer of this letter ..... DAVID K. MBAABU .....

Registration No..... D61/66129/2013 .....

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.

UNIVERSITY OF NAIROBI
SCHOOL OF BUSINESS
05 SEP 2016
P.O. Box 30197 - 00100, NAIROBI

PATRICK NYABUTO
SENIOR ADMINISTRATIVE ASSISTANT
SCHOOL OF BUSINESS

APPENDIX II QUESTIONNAIRE

PARTA PERSONAL DETAILS

1. How long have you worked in this facility?

Less than five years ☐ more than five years ☐ more than ten years

2. What is your current job designation?

g) Purchasing /stores clerk

h) Purchasing /Supply chain officer

i) Procurement /Supply chain manager

j) Other (specify)

3. How long have you served previously in a similar position in a different facility?

a) Under 3 years

b) 3-5 years

c) 5-7 years

d) More than 7 years

4. Are the operations of the facility integrated?

a) Yes

b) No

PART B GREEN PRACTICES AND SUPPY CHAIN PERFORMANCE.

The following is a list of Green Supply chain management practices, please highlight to which extent is one practiced.

Use the following key to respond to the questions; VGE- Very Great Extent, Great Extent, ME-Moderate Extent, SE- Small Extent and NE-No Extent.

No.	GSCM PRACTICE	VGE	GE	ME	SE	NE
1.	Having a recycling product policy.					
2.	The Hospital regularly conducts trainings on waste management					
3	There is a an environmental monitoring unit within the facility					
4	ISO certification is always implemented.					
5.	The hospital controls risks from suppliers and clients in general					
6.	There is Process integration in the facility.					
7.	The facility always prefers recyclable and repack gable s materials to, single use ones.					
8.	There is proper labelling of waste disposal points.					
9.	Safety measures are in place to absorb pollution.					

10. Please indicate other Green supply chain management practices done at the facility.....

.....

PART C: SUPPLY CHAIN PERFORMANCE

Please tick accurately how you rate the performance of your facility in regards to the measure listed.

5 VGE- Very Great Extent, 4.Great Extent, 3.ME-Moderate Extent, 2.SE- Small Extent and 1.NE-No Extent

GSCM Parameters	5	4	3	2	1
Reliability					
Affordable cost of services					
Quality supply chain cost management					
Flexibility in order configurations					
Timely client processing					

PART D: CHALLENGES OF IMPLEMENTING GREEN PRACTICES IN GOVERNMENT HOSPITALS

Please tick what in your opinion are the barriers to GSCM practices in your facility. VGE- Very Great, GE- Great Extent, ME-Moderate Extent, SE- Small Extent and NE-No Extent

	5	4	3	2	1
Lack of commitment by the top managers.					
Existence of numerous formal procedures.					
Lack of clear policies to enforce the law.					
Presence of obsolete equipment.					
Financial challenges to implement.					
Lack of human capacity and knowledge to implement.					

Thank you for your time.

APPENDIX III: LIST OF GOVENRNMENT HOSPITALS IN NAIROBI COUNTY

LIST OF NAIROBI COUNTY GOVERNMENT HEALTH FACILITIES (DISPENSARIES & HEALTHCENTRES) (SOURCED FROM KEPI MARCH 2016)

NAME OF FACILITY	LOCATION
Kenyatta National and Referral Hospital	Ngong road
Mama Lucy Kibaki District Hospital	Kayole/Umoja
Mbagathi District Hospital	Mbagathi Highway

LEVEL 4

Pumwani Maternity Hospital	PUMWANI

LEVEL 3

Bahati health center	Bahati estate
Eastleigh health center	Eastleigh
Ngarahealthcenter	Ngara
Ngaira health center	HailleSallesie Avenue
STC Casino	River road
Huruma Lions health center	Huruma Estate
Biafra clinic	Biafra Estate
ShauriMoyoHealth Centre	ShauriMoyo
Muthurwa market Health Centre	Muthurwabus terminus

Jerusalem Clinic	Jerusalem estate
Kariokor Clinic	Kariokor estate
Pangani Clinic	Pangani
Marble Arch Hotel Health Centre	River road
Mathare Police Depot Health Centre	Mathare
Mathare North Health Centre	Mathare North
. Kariobangi North Health Centre	Kariobangi North
. KasaraniHealth Centre	Kasarani/Mwiki
. Kahawa West Health Centre	Kahawa west
. Baba DogoHealth Centre	BabaDogo estate
. NYSHealth Centre	Thika superhighway
. GSU Headquarters Health Centre	Thika superhighway
. Kamati Prison health Center	Kamiti prison
Ruiru Prison Staff Training College health centre	Ruiru
. Waithaka Health Center	Waithaka
. Westlands Health Centre	Westlands
. KangemiHealth Centre	Kangemi
. Lady NortheyHealth Centre	State house road
. Kabete Approved School. Health Centre	LowerKabete
. KARI MugugaHealth Centre	Muguga
. Lower KabeteHealth Centre	Lower Kabete
. Riruta health Center	Riruta
. Ngong Rd health center	Ngong road

. Dagoretti Approved School	Dagoretti
. Langata Health centre	Langata estate
. Karen,Hardycenter	Karen
. Kibera DO Health centre	Kibera
. Langata Women Prison Health /Center	Langata women's prison
. Jinnah Clinic	South C
. Nairobi West Prison health center	Nairobi west estate
. Uhuru camp health center	Mbagathi Road
. Kibera DO Health center	Kibera
. KiberaAmrefHealth Centre	Kibera
. GSUKiberaHealth Centre	Kibera
. Kayole 1 Health Centre	Kayole
. Kayole II Health Centre	Kayole
. UmojaHealth Centre	Umoja
. Embakasi H/C	Embakasi
. GSUEmbakasi H/C	Embakasi
. APTCEmbakasi H/C	Embakasi
. Dandora 1 H/C	Dandora
. Dandora 11 H/C	Dandora
. Njiru H/C	Njiiru
. Makadara H/C	Makadara
. Mbotela H/C	Mbotela estate
. Jericho H/C	Jericho Estate
. Loco H/C Location:	Nairobi Railway station

. Station, Industrial area	Industrial area
. Railway training Institute (South B)	South B Estate
. LungaLunga H/C	Industrial area
. Nairobi remand Home	Industrial area

LEVEL 2

Lagos Rd. Disp.	Lagos road
Kariobangi South Dispensary	Kariobangi south
. GSURuiru Dispensary.	Ruiru
State House road Dispensary	State house road
. CID Headquarters Dispensary.	Kiambu road
. Rhodes Chest clinic	HailleSallesie Avenue
Kaloleni Dispensary	Kaloleni estate
. MjiwaHuruma Dispensary	Thika superhighway

LEVEL 1

Woodley Clinic	Woodley estate

Sourced from KEPI (2016)