GREEN PROCUREMENT PRACTICES AND SUPPLY CHAIN PERFORMANCE OF COMPANIES LISTED AT THE NAIROBI SECURITIES EXCHANGE

BY:

DANSON IDY PEMBERE

SUPERVISOR:

MICHAEL K. CHIRCHIR

A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION, SCHOOL OF BUSINESS, UNIVERSITY OF NAIROBI

2016

DECLARATION

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

Signature……………………………..   Date…………………………………

Danson Idy Pembere

D61/74187/2014

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

Signature…………………………………… Date ……………………………………………

 Mr. Michael K. Chirchir

Lecturer,

Department of Management Science

School of Business

University of Nairobi

ACKNOWLEDGEMENT

I give thanks to the Almighty God for enabling me to be where I am today.

I sincerely thank my classmates for their support during the course of my studies.

My supervisor, Mr. Michael Chirchir, for his guidance towards completion of this project.

DEDICATION

To Procurement and Supply Chain Management Students.

ABSTRACT

Environmental awareness has gained global prominence in tandem with the escalating challenges emerging from the environment that impacts the way of life (Wang, 2009). Now, more than ever, the world population is aware of the negative effects caused by environmental degradation. Key environmental concerns are dumping of hazardous wastes, the depletion of the ozone layer, and global warming. This study purposed to establish the green procurement practices and supply chain performance of companies listed at the Nairobi Securities Exchange (NSE). It was based on the following objectives: To determine the extent to which green procurement is practiced by companies listed at the NSE, to determine the relationship between green procurement practices and supply chain performance, and to establish factors that affect the implementation of green procurement practices. To meet the research objectives, the study targeted the entire population of 64 respondents from which 47 completed and returned the questionnaires thus a response rate of 73.4%. The target respondents were the Procurement/Supply Chain managers or their equivalents of each listed company. The study used primary data. Data was collected through a self-administered questionnaire that had both open and closed ended questions, designed to obtain definite responses. Statistical Package for the Social Sciences (SPSS) was used to analyze the data and presented the specific issues through coding and summarizing the responses of all the respondents. Regression analysis was also performed in establishing the relationship between green procurement practices and supply chain performance of companies listed at the Nairobi Securities Exchange. The findings indicates that adoption of green procurement practices improves the supply chain performance. The improved performance is reflected through improved customer service, minimized ordering costs, and reduced inventory stock. This shows that green procurement is a well customized process to suit the organization's changing needs as companies had very well defined green procurement strategies. Implementation of green procurement helps organization achieve a competitive advantage however, emphasis should also be in addressing the challenges arising from a dynamic business environment such as lack of employee training and motivation, limited resources, absence of support from the organization leadership and opposition to change by suppliers. The researcher therefore recommends that the management teams of listed companies at the NSE need to embrace green procurement initiatives to help them appreciate the direct impact on supply chain performance. These initiatives should be integrated in the wider organization strategy to achieve the company's goal. The limitation of the study is that it focused on companies listed at the NSE therefore, the results might not be conclusive for companies not listed at the NSE. More research can be undertaken on factors affecting implementation of green procurement of companies listed at the NSE. The study proposes that comparable studies should be done in other areas of the Kenyan economy.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACRONYMS AND ABBREVIATIONS

ATS	Automated Trading Systems
BSC	Balance Score Card
ESG	Environmental, Social and Corporate Governance
FISMS	Fixed Income Securities Market Segment
GP	Green Procurement
GSCM	Green Supply Chain Management
MIMS	Main Investment Market Segment
NSE	Nairobi Securities Exchange
SCM	Supply Chain Management
SSE	Sustainable Stock Exchanges
SPSS	Statistical Package for Social Science
WAN	Wide Area Network

CHAPTER ONE: INTRODUCTION

1.1 Background

The world population has a responsibility to develop and implement procurement policies that promote a sustainable approach to making goods and services (Nasiche and Ngugi, 2014). Increasingly, governments, enterprises and development agencies have adopted environmental criteria within their supply chain system in order to promote corporate objectives on sustainable development (Nijaki and Worrel, 2012). Various researchers have examined the positive linkage between effect of green procurement and its contribution towards reduction of sources of waste and promotion of recycling among other benefits (Guenther, 2010). This contribution from procurement has strategically positioned environmental issues within organizations as part of the corporate wide goals.

Procurement has conventionally been seen as a process where raw materials or inputs are acquired, transformed into finished outputs, and then distributed to the customer. This should gel with the growing importance of suitability of the environment as part of the business norm. The procurement function therefore, having grown over the years, has become a strategic contributor to the corporate objectives, by continuously reducing environmental impact arising from business activities (Preuss, 2001).

1.1.1 Green Procurement

Several scholars have given different description of the concept of procurement. Harland (2001) describes procurement process as the coordination of the commercial activities and managing business relationships within and outside the company that include the suppliers and the customer to create an integrated system within the value chain. On their part Scott and Westbrook (1991) defined procurement as the integrator of various elements within the business ecosystem that run from acquisition of raw materials, processing and final delivery of the product to the customer. This definition spans the entire value flow, from the source to end user and the relationships within each process.

Zsidisin and Hendrick (1998) highlighted notable elements of green procurement that include green specifications, collaborative relationships with suppliers on environmental

issues and conducting audits to assess the suppliers compliance to requirements including ISO14001 certification.

Zhu (2002) noted that green procurement is the commitment by all business units in the company to reduce the use of excess materials to minimize cost, protecting the resources and to enhance the corporate image of the organization. Martha and Houston (2010) indicated that the objective of green procurement is to cut out waste, and procurement function will focus on value by considering the total cost in the process of removing waste. This study agrees with the definition of Zsidisin and Hendrick (1998) which is broader and addresses aspects of green procurement practices. Practices are exercises that are performed repeatedly over a period of time and they end up becoming a custom. Green procurement practices include, Supplier selection, E-procurement, Lean supply and Supplier development.

1.1.2 Supply Chain Performance

Supply chain management is the organization and management of an integrated system that controls the flow of value from the source to the final destination. Every phase in the supply chain process creates an environmental concern that affect, from resource mining, to processing, recycling, or disposal (Ninlawan and Seksan, 2010). Supply chain performance is the assessment of the value chain and it considers metrics such as cost and the consumption elements (Chang, Tsai and Che- Hsu, 2013). Sustainable procurement includes aspects such as green procurement that eliminates waste in the supply chain, social concerns that involve good conditions for workers or acquiring goods in an ethical manner. The economic elements can be in the form of sourcing supplies from the local establishment to promote the local economy and create a multiplier effects. Companies have different approaches to meeting their sustainable objectives, with some focusing on social aspects while others being committed to green issues (Walker and Jones, 2012).

Supply chain performance measurement can be done through Triple-A supply chain construct which are those supply chains that exhibit agility, adaptability, and alignment. Agility is the capability to match the market dynamism within a minimum time span arising from variations in demand or supply in order to meet the customer needs.

Adaptability on the other hand is the ability to change the supply chain model to meet the market dynamism in order to fulfill the product offering. Alignment is the capability of great firms to integrate business unit objectives, including that of procurement function, with the corporate goals (Whitten, Green and Zelbst, 2012).

1.1.3 Nairobi Securities Exchange

The country started trading in stocks in the 1920's when Kenya was still under the British rule. However the market was not official due to absence of legislations to control the trading activities as there were no rules and regulations to govern stock trading activities. The Nairobi Stock Exchange (NSE) was registered under the Societies Act (1954) to bring together stockbrokers and to develop the securities market and regulate trading activities. In 2001, the trading platform was divided into the Main Investment Market Segment (MIMS), Alternate Investment Market Segment (AIMS) and the Fixed Income Securities Market Segment (FISMS).

The NSE acquired an Automated Trading Systems (ATS) for trading equities, immobilized corporate and treasury bonds. The NSE has its Wide Area Network (WAN) platform to support the ATS, therefore, brokers and investment banks can now trade remotely. In 2014, the NSE, through a successful initial public offering, listed its 194,625,000 issued and fully paid up shares on the Main Investment Market Segment (MIMS) with the intention of raising Kshs.627 million by selling 66 million new shares at a price of Kshs. 9.50 per share. From the latest annual reports of 2014, equity turnover rose by 38.5% from 2013's Kshs. 311.5 Billion to 2014's Kshs. 431.46 Billion. The NSE 20 Share Index appreciated by 3.77% from 4,926.97 in 2013 to 5,112.65 at the close of 2014 (NSE Annual report 2014). It has twelve counters with sixty four listed companies. The Exchange's trading hours are 9:00 am – 3:00 pm.

1.2 Research Problem

Green initiative has elicited interest among scholars in supply chain management. The prominence of green sourcing is driven by various factors key being the increasing corrosion of the environment, reduction of raw materials, neglected waste sites and the rise in levels of environmental pollution. However, as focus shifts to adoption of

environmental strategies, there is need to be in tandem with the business requirements that lead to high profits (Wilkerson, 2005). Martha and Houston (2010) noted that the objective of green procurement initiatives is to reduce waste, with a focus on what creates value by taking into consideration the total cost of implementing green procurement strategies.

The NSE currently has twelve counters with sixty four listed companies, with a 20 share index as a performance reference for the top twenty ranked best performing companies. In 2014, the NSE became a member of the United Nations-led Sustainable Stock Exchanges (SSE) Initiative. This initiative brings together investors, regulators and issuers to promote corporate transparency and link performance of listed companies on environmental, social and corporate governance (ESG) issues. At the same time, it encourages responsible sustainable approaches to investment by the listed companies (NSE Annual Report, 2014).

There are several studies on impact of green purchasing to suppliers performance and involvement in the green strategies by companies. Blomea, Hollosby and Paulrajac (2013) found that the link between GP and supplier performance is supported by green supplier development. Caniëls (2013) identifies supplier readiness and customer requirements to be key motivators for suppliers to adopt GP practices. In addition, cooperative relation norms and customer investment enhanced adoption of green procurement practices by large suppliers. These studies however were done in developed countries and therefore there was need to undertake a study on GP in Kenya to determine the extent of concurrence or contradiction with earlier studies.

A study done by Nasiche and Ngugi (2014) on green procurement practices at Kenya Pipeline Company found out that the economic and sustainability benefits of green procurement practices are higher than the cost, particular over an extended period. The findings also indicated that cost is not a barrier to implementation of green procurement practices at Kenya Pipeline Company. However these findings contradict studies done earlier by Bouwer (2006), Brammer andWalker (2011) which discovered that increased cost of green products is a hindrance to adoption.

A study by Khisa (2011) shows that many organizations were either considering or just initiating implementation of green supply chain practices. From his findings, there is need for the public sector organizations in Kenya to adopt green supply chain practices to support the effort to conserve the environment. His study further noted that most organizations are not aware of the green supply chain practices. A study by Mugabe (2013) on Green Supply Chain Practices among pharmaceutical companies in Kenya showed that pharmaceutical companies are considering green supply chain management practices. Her results indicated that there exists a strong linkage between supply chain performance and green management practices, therefore there was the need to establish whether a similar relationship exists among companies listed at the NSE.

From the foregoing studies, it is evident that concentration has been on green supply chain management practices and not on green procurement practices. Therefore, this study sought to answer the following research questions; what is the extent to which green procurement is practiced by companies listed at the NSE? What is the relationship between green procurement and supply chain performance of companies listed at the NSE? What are the factors that affect the implementation of green procurement practices by companies listed at the NSE?

1.3 Research Objectives

General Objective

To determine the extent of implementation of green procurement practices

The study sought to achieve the following specific objectives;

i. To determine the extent to which green procurement is practiced by companies listed at the NSE,

ii. To determine the relationship between Green procurement practices and supply chain performance of companies listed at the NSE,

iii. To establish the factors that affect the implementation of Green procurement practices by companies listed at the NSE.

1.4 Value of the Study

The findings will be of benefit to the management of companies listed at the NSE who will gain insight into how their organization could effectively manage and use Green Procurement practices. The study will offer an understanding on the importance of adopting Green Procurement and as such will improve their performance and competitiveness.

Understanding the Green Procurement practices adopted by companies listed at the NSE will help policy makers in the line of ministries of the governments and other state agents involved with environmental matters to come up with targeted policies and programs that actively stimulate the growth and sustainability of the economy.

It will be of value to academicians and researchers as they will find useful gaps that will stimulate interest in further studies.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This section reviews the literature on the concept of Green Procurement practices, its breadth and the linkage to supply chain performance, the challenges on the adoption and implementation of green procurement and the the supply chain performance measures.

2.2 Theoretical Literature Review

Organizational theory provides a basis to describe organizational behaviors, designs, or structures. Past research on green procurement and sustainable procuremnt has considered Institutional Theory, the Resource-Based View (RBV) Theory and Stakeholder Theory. RBV provides a basis on how firms can derive competitive advantage by undertaking environmental practices. The Institutional Theory on the other hand justifys why organisations embrace green procurement.

2.2.1 Institutional Theory

Institutional theory provides that companies undertake certain strategies based on forces outside the company (Scott, 1994). These strategies help companies to enhance their acceptance by the customers and other stakeholders. Aspects of isomorphic pressures have been recognized namely coercive, normative and mimetic pressures, which lead to the implementation of similar practices across firms (DiMaggio and Powell, 1983). Jennings and Zandbergen (1995) gave an explaination on the adoption of practices within the environmental context, including other scholars who have further explored the positive impact of these institutional pressures on green procurement (Sarkis *et al.,* 2010).

2.2.2 Resource Based View Theory

The RBV theory of the firm emphasises that valuable, rare, imperfectly imitable, and non-substitutable resources create a competitive edge (Melville, Kraemer and Gurbaxani, 2004). Cardeal and Antonio (2012) explained that the resource based view (RBV) considers certain resources and notes that a competitive edge is founded on Valuable, Rare, Inimitable resources and Organization (VRIO).These resources include assets, capabilities, organisational processes, information, grouped as tangible or intangible

resources. The RBV highlights that the environment may create a barrier that affects the competitive business edge and hence the need for businesses to leverage on the environmental advantages in order to be ahead of competition (Hart, 1995).

Pralahad and Hamel (1994) promoted the theory of core competences. Competences represents what a company is able to excel (Prahalad and Hamel, 1994), however, the core competencies represents a set of abilities that a company can leverge to outperform peers in the market place (Lawson and Lorenz, 1999). Under the Resource Based View, it is important that companies channel resources to leverage their core competences. This theory is key to companies listed at the NSE implementing green procurement practices.

2.4.3 Stakeholder Theory

The definitions of the term "stakeholder" have been given by different researchers (Mainardes, Alves and Raposo, 2011). However, most studies adopt the definition by Freeman (1984) who decribed stakholder as individual or group impacted by commercial activities of a company. Stakeholder theory notes that other than shareholders, there are other individuals or groups who the organization is obligated to and who are likely to be directly influenced by the actions taken by it, or have an explicit contractual relationship with it (Alkhafaji, 1989).

With respect to the environment, some stakeholders expect that firms will operate in ways that minimize externalities such as water pollution, solid waste disposal, forest cover depletion and emission of environmentally harmful gases and assume greater responsibility to correct any effects that may occur (Alkhafaji, 1989). Failure by the organization to meet these expectations results in loss of legitimacy and subsequently diminishes its chances of survival. From a strategic point, firms that adopt GP practices have an edge over competition. Barney (1991) argues that corporate brand is a valuable resource overall and that there is evidence linking these to GP which is considered to have business value (Foerstl, Reuter, Hartmann and Blome, 2010; Sarkis, 2009).

2.2.4 Conclusion on the Theories

The theories indicate that there is a trend towards green procurement and provides evidence of its linkage to supply chain performance. Firms operate under similar institutional pressures yet there is defference in performance between them. Barney (1991) attributes these differences to the firm's unique set of resources. Earlier findings on the stakeholder theory show that stakeholders, when properly recognised and engaged, may lead to better performance of the supply chain and organisations need to consider their interests (Carter and Jennings, 2004). Natural resource is a strategic resource which results in unique and difficult to imitate practices. It can contribute to better results in supply chain and increase competitiveness. This study therefore used the RBV, that a firm's acquition of core resources and the capabilities it has established during its existance is critical in changing institutional enablers into better performance improvement.

2.3 Green Procurement Practices

Blomea et al. (2013) carried out research on green procurement and supply chain performance of Western European companies. They considered three green procurement practices namely, supplier development, supplier selection and e-procurement. Carvalho and Cruz-Machado (2009) explored the integration of Lean and Green paradigms while García-Rodríguez (2013) identified e-procurement as a practice in green purchasing. A study by Kyalo (2015) on green supply chain practices in alcoholic beverage manufactures identifed supplier selection as a practice under green purchasing. From the foregoing, none of the studies have considered all the four green procurement practices namely; supplier selection, e-procurement, lean supply and supplier development.

2.3.1 Supplier Selection

In the past, sourcing for a supplier considered the following elements; price, flexibility and quality in order to identify and select a desired suplier (Dowlatshahi, 2000). In the recent past, the basis of selection has widened to include more parameters on green issues, over and above the traditional criteria (Bai and Sarkis, 2010). Supplier selection,

monitoring and auditing supports the green agenda to a greater extend and therfore has prominence over other variables (Seuring and Muller, 2008).

Guo and Tsai (2015) conducted research on evaluating green supply chain suppliers and found out that the criteria used to assess suppliers were green design, green materials including supplies, adoption of green processing, selling and packaging in a green way, environmental friendly transportation, and recycling. Further, in their study, Guo and Tsai used twelve criteria for evaluating green suppliers and analyzed the results. The research concluded that four green criteria which include; design, material use, waste reduction and energy conservation, and reduction of harmful substance use are the key drivers for green practices. Requirement for ISO 14001 certifícation and ICT is widely accepted as a basis for assessing suppliers, going by the literature review (Stevenson, 2009; Iloranta, 2008; Petcavage and Pinkerton, 2010). Perfomanece of the supply chain system is depended on adoption of the four criteria in evaluating suppliers to achieve the green objectives of a company.

2.3.2 E-procurement

E-Procurement is where companies use the internet platform to automate traditional procurement processes such us planning, supplier selection, order processing, payment and post procurement monitoring and evaluation (Croom and Brandon-Jones, 2004). E-procurement facilitates implemntation of business strategies that lead to high profitability. In the same vein, it has been an enabler in implementation of green procurement strategies by eliminating use of paper and printing solvents that reduce impact to the environment (Hasan and Abidin, 2010). García-Rodríguez (2013) noted that adoption of E-Procurement, complimented by system integration with suppliers and strong customer relationship, ensured that the value chain becomes waste free due to implementing practices like recycling, and reuse of materials.

Walters (2008) suggested that to ensure customer satisfaction and customer loyalty, companies must work with their suppliers as well as the customers to ensure delivery of desired goods, just in time. For such supply chain integration that delivers value to happen, organization use ICTs to enhance supply chain efficiency. E-procurement,

enabled by advance in ICTs, has been promoted as one way of improving procurement efficiency and effectiveness (Musau, 2015).

2.3.3 Lean Supply

The phrase "lean supply" was coined by Lamming (1996) as a result of research into Japanese supply strategies. Supply chain rationalization dominated the Japanese approach, allowing time and resources to be used in a more focused manner for process improvement and new product development. The implementation of lean supply in businesses has changed in the recent past. Companies are relying on adoption of lean attributes to drive value through their supply chain in order to gain a competitive edge. Lamming (1996) describes lean supply as the attempt to streamline the supply chain to ensure that only value flows through and the reources employed are utilised optimally. This processes is then subjected to continous improvement in order to better performance that meets the expectation of the business. He goes on to argue that an integrated system that promotes end to end collaboration from the supplier to the end customer supports the successful implementation of lean supply.

Several reserachers have conducted studies on lean supply in supply chain management. Carvalho and Cruz-Machado (2009) explored the integration of Lean, agile, resilient and Green paradigms. They depict a causal relationships of supply chain elements and key performance indicators that include cost, service level and lead time in a conceptual model, which explains the concurance and divergence in this concepts. The concurance is mostly on the attribbutes of lean and green procurement practices and its linkage with supply chain, such as surplus arising from excess capacity, levels of integration, inventory level, lead time in processing and the time taken to transport final products (Carvalho and Cruz- Machado, 2009).

2.3.4 Supplier Development

Firms are now adopting green procurement practices as a result of tightening environmental regulations and genuine demands from customers and other stakeholders (Rusinko, 2007). Firms in the service and manufacturing sector may minimise business acticities that negatively affect the environment by first adopting technologies that

promote environmental conservation and secondly by being proactive through investment in prevention of environmental degradation as opposed to pollution control (Klassen and Vachon, 2003). Business are now engaging upstream suppliers, including tiered suppliers in the implementation of sustainable strategies through a long term collaborative arrangement (Awasthi, 2010).

Collaborative engagements between procurement function and suppliers have positively influenced environmental impact on businesses especially in the follwing areas; reduction of inbound logistics' environmental pollution, positive environmental impact of supplied material, optimised energy consumption and emissions in the manufacturing process, and eco-efficiency of the product through its life cycle (Jayaraman, 2009). Green supplier development is a practice of green procurement and it involves various activities that include; working with suppliers to build their capacity on green issues, carrying out supplier visits in factories to review performance metrics, continous communication on green performance metrics, and rewarding suppliers who make improvements in adopting green strategies (Krause and Scannell, 2002). Green supplier development therefore borrows from the resource based view on acquiring core competencies through supplier collaboration that enhance the competitive edge of the business.

2.4 Supply Chain Performance Measurement

Supply chain performance is the assessment of supply chain based on various variables key being cost and capacity optimisation (Chang, Tsai and Hsu, 2013). The balanced score card provides a suitable measure of supply chain performance. Halme (2010) posits that the balance score card focuses on four attributes which include; customer satisfaction, internal business process, financial stewardship and finally organisational capacity. Customer satisfaction focuses on how the business can generate value to the final product for the benefit of the customer, in essence, it is the value proposition to the customer which may be in the form of good quality, timely delivery of goods or services or affordable price. It is therefore important that businesses define their performance metrics that support fulfilment of customer requirements while the same time increasing profitability. The second area is the internal business processes that dwell on promoting effeciencies and minimizing wastes to optimize production. The third is financial

perspective which measures financial success. Focus is on increasing profits, expansion of the business portfolio and increasing shareholder value. Finally, organisational capacity is concerned with measuring the levels of knowledge and understanding of the business environment in order to support innovation and improvements in order to create value for sustainability of the business. There are drawbacks to BSC approach in practice. Developing and implementing BSC is a complex and time consuming exercise. It will often imply radical change of management style and organisation culture, for which resources and support may not be available (Cousins and Lamming, 2012).

An alternative model is the Supply Chain Operations Reference (SCOR), adopted by various companies operating in different sectors across the globe. It was popularised by the Supply-Chain Council, a global association of companies with a focus on supply chain management. It encompasses various elements of supply chain key among them being organisation of business processes, measurement of key performance areas, adoption of best practices and the continous development of the human capacity. The SCOR model provides a framework to assess performance based on five key areas planning, sourcing, make, delivery, and reverse logistics. This framework has performance metrics that are grouped into four key measures that include reliability, responsiveness, agility and cost which provide a panaromic view of the evaluation of the neccesary resources needed to meet a customer order (Supply Chain Council, 2010). This study proposes to use the SCOR model.

2.5 Green Procurement and Supply Chain Performance

Researchers have in the past carried out studies on the influence of implementing green strategies in procurement and the effect on the performance of the supply chain. Challenges however, have been on how to define and measure performance that is linked to green procurement initiatives. Zhu and Sarkis (2004) in their study, noted that there is a positive link between green procurement and profitability of the business. But this may not be conclusive to mean that integration of green procurement practices leads to operational efficiency and superior performance of the supply chain (Zhu, 2010), therefore, further research is neccesary to establish whether a firm relationship exists. The study findings by Carter (2000), and Chan (2012) indicate that there was an increase of

the net earnings of businesses who embraced GP practices. Zhu (2010) equally noted similar results underscoring the strategic contribution of procurement to the overall strategy of the organisation.

The overall superior accomplishment of the supply chain is supported by collaborative organisation between the firm and its suppliers through maintaining healthy relationships, continous commmunication and feedback and integration of the ICT platform to support environmental goals (Zsidisin et al, 1998; Zsidisin et al., 2001). Studies done by Rao (2005) and Handfield et al., 1997) indicate that suppliers have a responsibility to provide environmental friendly products that support the competitive advantage of the firm in the market place.

2.6 Enablers and Challenges in Implementing Green Procurement

Enablers are factors that assists companies to implement green procurement (Gimenez and Tachizawa, 2012). However, the presence of enablers is not sufficient to support implemention of green procurement, but there absence is a barrier (Lee and Klassen, 2009). Regulations on environmental matters are the major enabler in GP (Hsu, 2013). Other industry requirements such as environmental accreditations and sustainable strategies aim to facilitate implementation of GP. These initiatives are required to be cascaded down to second and third tier suppliers who are required to comply with the requirements (Hall, 2001).

A study by Hussain (2011) identified twenty one enablers for implementing green procurement. They include: information sharing, employee training, adoption of environmental standards, strategic planning, supplier relationships, technology management, governmental regulations, adoption of green practices, management commitment, voice of customer, quality of life, government rewards and incentives, environmental quality management, adoption of safety standards, fairness in employment, employee healthcare, labour and welfare, philanthropy, and freeing of public space.

On challenges, businesses often times face challenges in adjusting their culture and the corporate priorities unless they are faced with a perception crisis. This means that implementation of GP by businesses may face some inertia due to the need to change the status quo. Consequently, businesses are required to analyse the bsuness landscape and identify challenges within their organisation and the entire supply chain. Past research has identified cost to be a major deterrance to GP. Contrary studies done by Zhu and Sarkis (2007) dicovered that green procurement practices in a factory set up is less costly than otherwise thought due to operational efficiencies.

A study of the public procurement sector by Walker and Brammer (2009) discovered that absence of information on the effect of the environment is major challenge, especially on the products delivered, sourcing for suppliers and absence of clear guidelines on environmental issues. Other challenges noted from review of past literature include; lack of suitable technology, lack of clear benefits in the short term, inadequate training and competence in sustainable issues, poor supplier commitment, lack of transparency and visibility of the supply chain and inability of businesses to institutionalise environmental issues in their corporate strategy (Genovese, 2013).

2.7 Empirical Literature Review

Empirical evidence on the link between GP practice and supply chain performance shows mixed findings of positive, negative, no relationship and even mixed associations. Most of these studies take a positivist stance.

ElTayeb, Zailani and Jayaraman (2010) examined the enablers of GP among firms with environmental certification in Malaysia, specifically, the study focused on the impact of four drivers namely; legislations, client demands, societal expectations, and the desired gains from GP in the Malaysian manufacturing sector. Using a random sampling research technique, they held key informant guided interviews with leaders of the corporations in the sample size. The results of the research show that GP is influenced by legislations, client demands, societal expectations, the desired gains, and firm ownership. The study also indicated that despite firms adopting corporate social responsibilty, it is not a convincing enabler for green procurement. Major limitations were; the study did not

consider other variables such as the role of external stakeholders who include the competitors, upstream supliers, the public and investors, in putting pressure on the businesses to go green. Also, the sample size selected was small; out of 569 firms selcted, only 132 were sampled, representing a 23.2 per cent.

In a case study of five portuguese companies, Azevedo, Carvalho and Machado (2011) reviewed the relationship between green supply chain practices and supply chain performance. They established a positive linkage between GSCM implementation and operational performance measures such as client delight and meeting specifications of the customer. Green supply chain also results in better environmental performance as observed in its negative relationship with business waste. However, certain shortcomings can be observed. First, the study does not explore the reasons why firms do or do not implement GSCM. Second, it only focused on the automotive industry in Portugal. Finally, the study does not establish a relationship between certain green practices and performance. These practices include; supplier relationships management on environmental issues, sourcing environmental friendly products and and procuring from suppliers with ISO 14001 certification.

Blomea, Hollosby and Paulrajac (2013) carried out a study on Green procurement and green supplier development: antecedents and impact on supply chain performance of Western European firms, with a focus on manufacturing and service sector. The research reviewed organisational experiences on performance, in comparison with the peers in the market on, financial outlook, and the leadership commitment over the years, relationship with suppliers and the collaborations. The sample was obtained from a repository of prominent supply chain consulting companies in Europe. Key informant questionnaires were administered to senior corporate leaders in the sampled firms. Major findings included, the need for the firm leadership to commit to green issues. Also, green supplier development was able to demonstrate direct impact to the supply chain performance. Limitations included; the study did not exhaust all variables such as capacity development, commercialising environmental factors, procurement knowledge and skills and the organisations governance set up that impact the supply chain performance. The study only focused on environmental aspect of green procurement and never considered

the social aspects such as safety. Further more, the sample size used was relatively small and only considered fewer countries in Western Europe.

Mugabe (2013) carried out a study to establish the relationship of green supply chain practices and the supply chain performance of pharmaceutical companies in Nairobi, Kenya. Methodology used was descriptive in nature and a census was adopted for all the target companies in the study population. The study discovered that majority of the pharmaceutical companies are not practicing the green supply chain practices, however most of them are using eco-packaging that are biodegradable and some have adopted reverse logistics strategies. Study shortcomings included a narrow focus on the pharmeceautical companies in Nairobi, and not all green supply chain practices were considered.

A case study approach was adopted by Nasiche *et al.* (2014) for a study on determinants of Green Procurement in public sector. The study evaluated factors that affect implementation of GP in public sector with a biase on Kenya Pipeline Company (KPC). The research discovered that internal capacities to implement green strategies and external motivators including demands from stakeholders and government legislation affected adoption of GP practices to a great extend. The issue of cost of implementation was not a major concern. The study showed that the institutional governance set up may be a success factor in going green. The major limitation is that the study only focused on one company; KPC, this makes the results inconclusive.

A study by Kyalo (2015) focused on green supply chain management practices and how they affect operational performance of alcoholic beverage manufacturers in Kenya. He used a descriptive design and carried out a census of the study population. The study found that manufacturers employ lean production and total quality management in their operations and also use biodegradable materials. The major limitation was that the findings might not be consistent with other sectors and hence limiting replicability.

2.8 Summary of Literature Review

Table 2.1 below provides a summary of empirical literature review, indicating the author and the year of study done either at global or national level, the topic, major findings and the study limitations and knowledge gaps.

Table 2.1 Summary of Literature Review

Authors	Topic	Major Findings	Limitations and Knowledge Gaps
ElTayeb, Zailani and Jayaraman (2010)	Enablers of GP among EMS 14001 certified companies in Malaysia	GP is influenced by customer demands, legislations and stakeholder demands	Small sample size Done in developed country.
Azevedo, Carvalho and Cruz Machado (2011)	Relationship between GSCM and supply chain performance of five automotive companies from Portugal	There is a positive relationship between green supply chain implementation and operational performance measures of customer satisfaction and quality	It does not explore the reasons why firms do or do not implement green supply chain. Also, it only focuses on the automotive industry in Portugal. Done in developed country.
Blomea, Hollosby and Paulrajac (2013)	a study on Green procurement, the role of green supplier development: antecedents and impact on supply chain performance of Western European firms	GP strategies needs to be complemented by the commitment from the organisation leadership. Also, green supplier development positively influences performance of the supply chain	Study only focused on environmental aspect of green procurement and never considered the social aspects. The sample size used was relatively small. Done in developed country.
Mugabe (2013)	GSCM and Supply Chain Performance of pharmaceutical companies	Pharmaceutical companies are not practicing the green supply chain.	A narrow focus on the pharmeceautical companies in Nairobi

	in Nairobi, Kenya		
Nasiche *et al.* (2014)	Factors of Green Procurement in public sector.	internal capacities, demands from stakeholders, government legislation are the main determinants of GP in public sector institutions	It was a case study and therefore findings may not be replicated to other public entities
Kyalo (2015)	GSCM practices and performance of alcoholic beverage manufacturers in Kenya	manufacturers employs lean production and total quality management in its operations and the manufacturers uses biodegradable materials	Findings might not be consistent with other sectors and hence limiting replicability.

Table 1. Summary of Literature Review (Author, 2016)

2.9 Conceptual Model

Below is the conceptual model for this study. The Independent variables in this study will comprise of: supplier selection, E-procurement, lean supply and supplier development, while supply chain performance will be the dependent variable.

Figure 2.1: Conceptual Model

Independent Variable   **Depended Variable**

Supply Chain Performance

| Supplier Selection |
| E-Procurement |
| Lean Supply |
| Supplier Development |

-Responsiveness

-Reliability

-Agility

-Cost
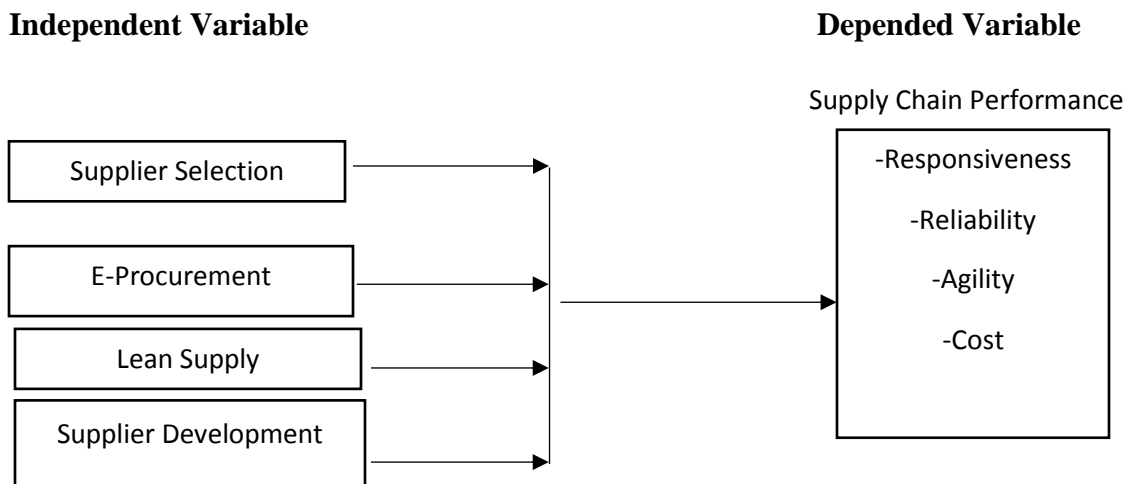
CHAPTER THREE: RESEARCH METHODOLOGY

3.1   Introduction

Chapter three outlines tha study methodology used which include the framework, study population, the tools used in collecting data, the techniques and approaches of analysis.

3.2 Research Design

This study used the descriptive research design to describe the variables. Salaria (2012) indicates that descriptive research is suitable in collecting information about a given study issue in order to describe and interprete the results. It has supported the conclusions.

3.3 Population

Target population was sixty four companies listed at the NSE spread across eleven counters (refer to appendix II). The study used a census approach since the population is relatively small.

3.4 Data Collection

The study relied on primary data that was collected using a self-administered questionnaire that consisted of both open and closed ended questions, using a 5 point Likert scale, that elicited specific responses. The questionnaire had five sections. Section one highlighted the profile of listed companies at the NSE, section two addressed Green Procurement practices, while section three established the relationship between GP practices and supply chain performance. Section four identified the enablers for implementing green procurement practices and section five addressed challenges in implementing green procurement practices. The target respondents were mostly Procurement Managers or their equivalent of each company listed at the NSE because they are responsible for performing green procurement practices. The distribution of the study tool was through a "drop and pick later" method.

3.5 Data Analysis

The research was quantitative in nature. Quantitative data was analyzed through the combination of descriptive statistics. Data was analysed using the Stastical Package for Social Sciences (SPSS) software. A summary of data analysis method for specific objectives is indicated in table 3.1 below.

Table 3.1 Summary of Data Collection and Data Analysis Methods

Objective	Questionnaire	Data Analysis
General information	Section One	Descriptive
Extent of green procurement practices by companies listed at the NSE	Section Two	Descriptive
Relationship between green procurement practices and supply chain performance of companies listed at the NSE	Section Three	Correlation and regression analysis
Enablers for implemementing green procurement practices	Section Four	Descriptive
Challenges faced in the implementation of green procurement practices by companies listed at the NSE.	Section Five	Descriptive

The following regression equation was used:

$S = a + b_1 x_1 + b_2 x_2 + b_3 x_3 + b_4 x_4 + e.$

Where:

S= Supply chain performance;   a= the S intercept,

$b_1, b_2, b_3, b_4,$ = Regression coefficient of respective variables;

e = the error term; x_1 = Supplier Selection;

x_2 = E-procurement; x_3= Lean Supply;

x_4 = Supplier Development

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

Chapter four presents the results from the data collection exercise and the analysis thereof. The study investigated green procurement practices and supply chain performance of companies listed at the Nairobi Securities Exchange. The aim of the study was to: determine the extent to which green procurement is practiced by companies listed at the NSE, determine the relationship between Green procurement practices and supply chain performance, and to establish the actors that affect the implementation of Green procurement practices.

4.2 Response Rate

The study targeted 64 respondents of which 47 completed the study questionnaire and was made available to the researcher that indicated a response rate of 73.4%, a satisfactory response to justify the conclusions. According to Mugenda and Mugenda (1999), a response rate of 50% is sufficient for data analysis and presentation, while 70% response rate will normally be considered excellent. The figure 4.1 below presents the results.

Figure 4.1: Response Rate
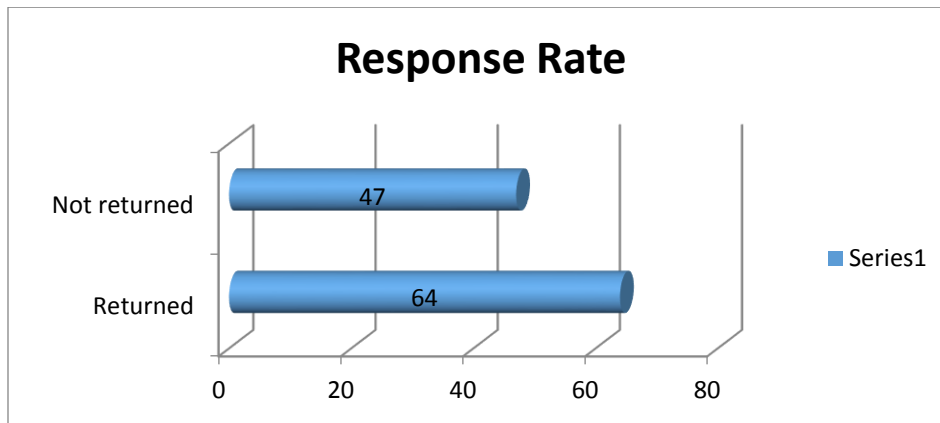
Source: Research data, (2016)

4.3 General Information

The study sought to find information on the respondents employed with length of period of work at the companies listed at the NSE, highest level of education attained, the position of the respondents, ownership of the company and gender of the respondents. The information is useful in determining the suitability of the respondents to complete the questionnaire.

The study indicated their positions. The results show that, 36.2% were supply chain managers, 27.7% of the respondents were operations managers, 4.3% of the respondents indicated Supply Chain/Operations Officer, 25.5% of indicated they were procurement managers and 2.1% was shared among supply chain consultant, supply chain auditor and supply chain project manager. It indicates that the respondents were conversant with green procurement practices. The figure 4.2 below presents the results.

Figure 4.2: Position of the respondent
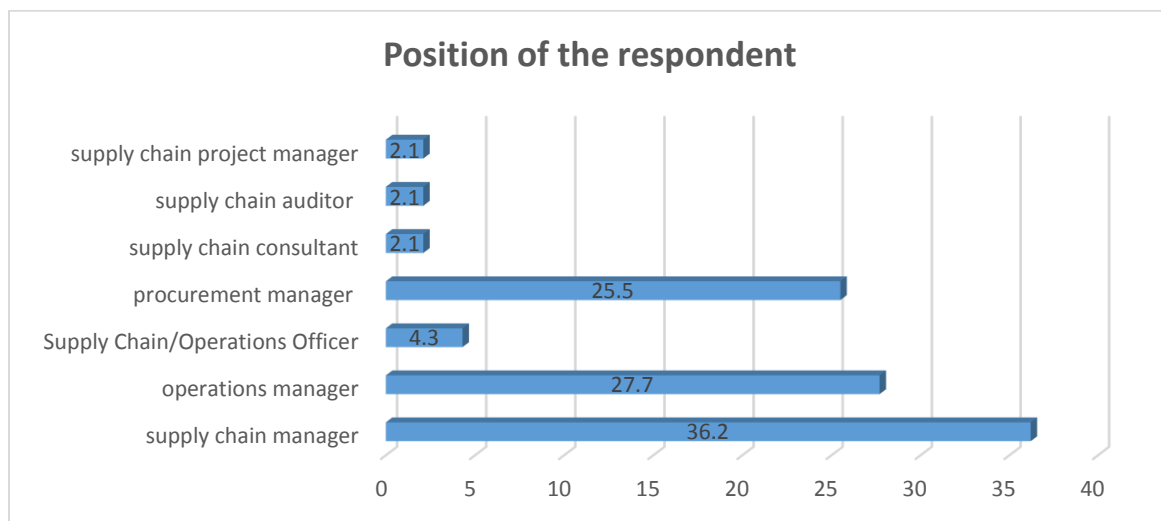
Source: Research data, (2016)

When asked the duration of time they had worked for the company, 21.3% of respondents reported to have worked for less than 5 years, 48.9% had worked for a period of 6 to 10 years, and 29.8% for 11 to 15 years. The table 4.1 below presents the results.

Table 4.1: Length of service in the organization

	Frequency	Percent
Below 5 years	10	21.3
6 to 10 years	23	48.9
11 to 15 years	14	29.8
Total	47	100

Source: Research data, (2016)

For education levels, 10.6% of the respondents had undergraduate degree, and 89.4% had a master's degree indicating clearly their level of articulation of the subject matter and their ability to contribute to the supply value chain and green procurement as was evident in the research findings. This is also the reflection of the NSE Company's culture of continuous training for better results. The table 4.2 below presents the results.

Table 4.2: Highest educational level

	Frequency	Percent
Bachelor's degree	5	10.6
Master's degree	42	89.4
Total	47	100

Source: Research data, (2016)

The respondents were asked to indicate their gender. Majority (53.2%) of the respondents was female and 46.8% of the respondents were male. This shows that generally, the margin between males and females is minimal. Thus, responses between male and female were essentially equal. The figure 4.3 below presents the results

Figure 4.3: Gender of the respondents

Gender of the respondents

46.8 53.2

■ Female ■ Male
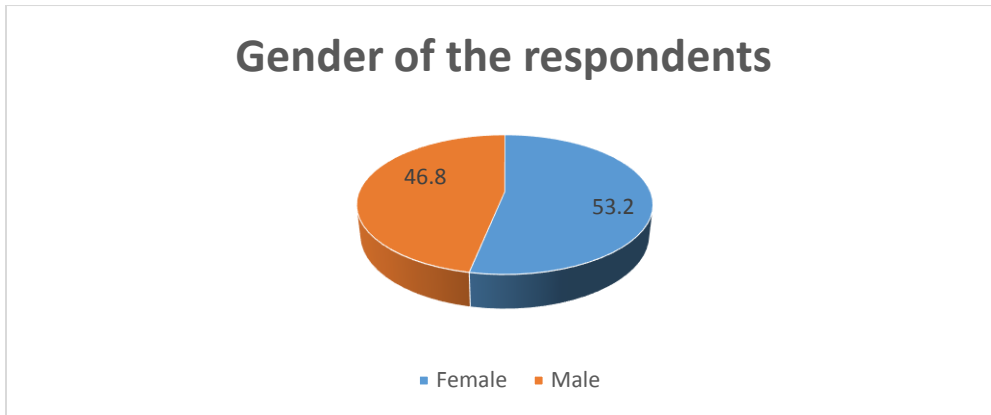
Source: Research data, (2016)

The respondents were also to provide information on the ownership of their company. 63.8% of the respondents indicated their company is locally owned and the remaining 36.2% indicated their company is both locally and foreign owned. The figure 4.4 below shows the results

Figure 4.4: Ownership of the Company

Ownership of the Company

36.2 63.8

■ Local ■ Foreign
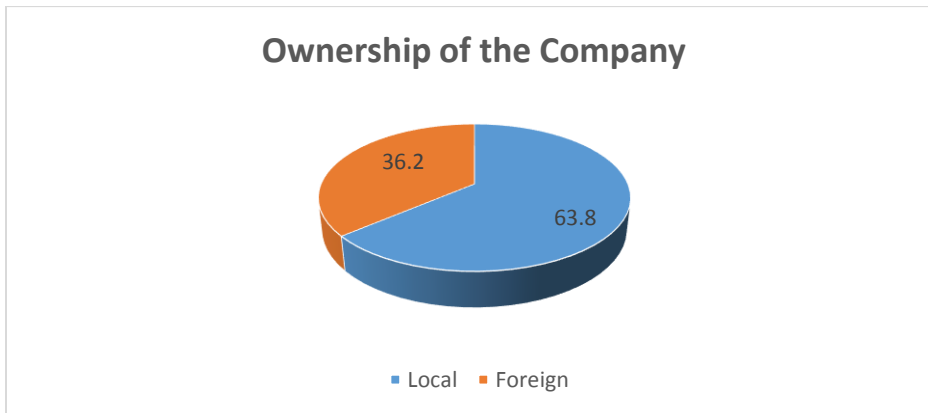
Source: Research data, (2016)

4.4 The Extent of Green Procurement Practices

The foremost objective is to assess the extent to which green procurement is practiced by companies listed at the NSE. Table 4.3 gives a summary of the findings as indicated below.

Table 4.3: The Extent of Green Procurement Practices

Lean supply	Mean	Std dev
Avoiding overstocking	4.333	.9034
Appropriate use of transport mode	3.923	.7892
Eliminating delays in delivery	3.909	.8123
Decreasing defects	3.891	.8237
Avoiding over processing	3.713	.7089
Composite mean and std deviation	**3.954**	**.8075**
Supplier Selection		
Green designed products	4.111	.9342
Energy conservation	4.001	.9053
Green Materials (recycle, re-use, reduce, re-furbish)	3.988	.8966
Green packaging material	3.881	.8743
Reduction in use of harmful substance	3.819	.8976
Suppliers to have ISO 14001certification	3.713	.9765
Composite mean and std deviation	**3.918**	**.9141**

Table 4.3 *Source: Research data, (2016)*

Table 4.3 Continuation

Supplier Development	Mean	Std dev
Supplier relationship management	4.028	.9123
Supplier investments (financial, machinery, technology)	3.987	.8961
Supplier visits	3.971	.8735
Frequent communication on green procurement KPI's	3.812	.7899
Supplier trainings	3.675	.7091
Rewards/Awards for improvements	3.870	.8972
Composite mean and std deviation	**3.891**	**.8464**
E-Procurement	**Mean**	**Std dev**
E-sourcing (soliciting of bids)	4.012	.9834
Electronic information exchange with suppliers	3.939	.8941
E-bidding (reverse auction)	3.910	.9233
Electronic supplier database	3.876	.8131
E-evaluation of bids	3.712	.8013
E-payment	3.617	.7231
Composite mean and std deviation	**3.844**	**.8564**

Table 4.3 *Source: Research data, (2016)*

On a scale of 1 to 5, where (1) very small extent (2) small extent (3) moderate extent (4) large extent (5) very large extent, the respondents were required to provide data on the extent of green procurement practices implemented by companies listed at the NSE. The

scores of strongly disagree and disagree indicate a mean score of 0 to 2.5 on the continuous Likert scale; ($0 \leq$ S.E<2.4). Scores of undecided show a mean score of 2.5 to 3.4 on the continuous Likert scale ($2.5 \leq$M.E<3.4) and the score of both agree and strongly agree indicate a mean score of 3.5 to 5.0 on the continuous Likert scale; ($3.5 \leq$L.E<5.0). A std dev of >0.9 implies a significant variance on the green procurement practices of the variable among the respondents. The green procurement practices adopted by the Companies listed at the NSE includes supplier selection, E-procurement, lean supply and supplier development with a composite mean and standard deviation (m=3.92, std=.914, m=3.84, std=0.86, m=3.95, std=0.81, and m=3.89, std=0.85) respectively. Due to the cut throat competition in the market place, it is important for companies to invest in the current suppliers and build their capacity on green issues to avoid the business landscape tilting away from them. The findings concurs with results from Carter (2000), which showed that GP is interlinked with the supply chain performance of the business and finally profitabilty.

The adoption of lean supply is to help the companies lited at the NSE to gain the competitive advantage. Lean practices improve quality and productivity by taking cost and waste out of all facets of an operation, from the procurement of raw materials to the shipment of finished goods.

The e-procurement adopted by the companies listed at the NSE is aligned to the corporate goal and leverages technology to achieve corporate priorities that have a positive impact to the performance of the supply chain. The findings concur with findings of Musau (2015) who established that advances in ICTs has been promoted as one way of improving procurement efficiency and effectiveness.

The results show that supplier development is important because it leads to establishment of long term relationship with the suppliers, hence companies listed at the NSE need to develop skills and capabilities of the suppliers to match the requirement(s) of the organization. To gain and maintain a competitive edge, companies strive to incorporate the activities of other partners in the supply chain. The level of integration in some organizations is high level of involvement, whereas in other organizations, it is characterized by low involvement (Gadde, L.-E. and Håkansson, 2001).

4.5 Relationship between Green Procurement Practices and Supply Chain Performance Measurement

The second objective of the study is to determine the relationship between green procurement practices and supply chain performance measurement. The results from the analysis is as shown below.

4.5.1 Pearsonian Correlation Analysis

Pearson's coefficient of correlation is considered as a tool to determine the extent of the relationship between two variables and is denoted by "r". It creates a line of best fit that links two variables which helps in determining the relationship between the two variables denoting the distance of each variable from the line of best fit. The coefficient, r, is usually between +1 to -1. In case of a 0 value, then it connotes the absence of a relationship between the two variables. Field (2005) indicates that correlation coefficient ought to be below 0.8 in order to escape multi co-linearity.

Table 4.4 below shows results which indicate a high correlation between, lean supply and supply chain performance with a value of 0.713, supplier selection and supply chain performance with a value of 0.607, E-procurement and supply chain performance with a value of 0.539 and supplier development and supply chain performance with a value of 0.506. Therefore the correlation coefficients are not collinear.

Table 4.4: Pearson Correlation Coefficients Matrix

Pearson Correlation	Supply chain Performance	SS	EP	LS	SD
Supply chain Performance	1.000	.607	.539	.713	.506
Supplier Selection(SS)	.607	1.000	.726	.556	.743
E-procurement(EP)	.539	.726	1.000	.632	.478
Lean Supply(LS)	.713	.556	.632	1.000	.486
Supplier Development(SD)	.506	.743	.478	.486	1.000

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Research data, (2016)

4.5.2 Regression Analysis

The table 4.5 below shows findings of the analysis on how strong each of the independent variable is a predictor of the dependent variable.

Table 4.5: Regression Coefficients

| Model | Un-standardized Coefficients | | Standardized Coefficients | | |
	B	Std. Error	Beta	t	Sig.
1(Constant)	.080	.416		.192	.847
Supplier Selection (x_1)	.429	.100	.383	4.29	.002
E-procurement (x_2)	.040	.014	.157	2.857	.005
Lean Supply (x_3)	.239	.086	.317	2.779	.007
Supplier Development (x_4)	.120	.060	.159	2.000	.049

a. Dependent Variable: Supply Chain Performance
Source: Research data, (2016)

From the table 4.5, the standardized and un-standardized coefficients show the contribution of each independent variable. The significance level in last column shows whether the contribution of the independent variable is statistically significant. The t value shows the likelihood that the value of the individual variable in the regression model is not zero (=0). The smaller the t value the higher the likelihood that the value of the variable is higher than 0. Table 4.5, shows the overall form of the equation to determine the green procurement and performance of supply chain in companies listed at the NSE, is as follows:

SC performance = .080 + .429 Supplier selection + .040 E-procurement + .239 Lean supply + .120 Supplier development.

The prediction model was obtained from the Coefficients table (Unstandardized coefficients), as shown above. The Unstandardized coefficients show the degree of correlation between the dependent variable and the independent variable, holding other factors constant.

For instance, the predictor model means that for every one unit change in supplier selection, supply chain performance changes by 0.429 units. Based on the model, supplier selection, e-procurement, lean supply and supplier development have the highest influence on procurement performance. The green supplier selection is important because first the businesses need to comply with existing legislations on environmental matters but equally important is the need to meet the customer requirements. This factors explain why supplier selection improves supply chain performance.

The corresponding *p*-value indicates that the relationship between supplier selection, e-procurement, lean supply, supplier development and supply chain performance has a 95% confidence level i.e. p-value<0.05.

Table 4.6: Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.931[a]	.867	.854	.200

a. Predictors: (Constant), Supplier Selection, E-procurement, Lean Supply, Supplier Development

b. Dependent Variable: Supply Chain Performance
Source: Research data, (2016)

The model summary, presented in Table 4.6., was highly significant (p=0.000) which is an indication that the model was a good fit. It had an R square value of 0.867 with a percentage variance of 86.7% for the supply chain performance. The P- value of 0.000 is an indication of 5% significance for the supply chain performance. R shows a strong positive relationship among variables with a value of 0.931. The Std error of the estimate relates more to the regression line than the mean.

Analysis of Variance (ANOVA) is a model for testing the hypothesis that $\beta_i \neq 0$ (there is a significant relationship between the response and predictor variables), against the null hypothesis that $\beta_i = 0$ (there is no significant relationship between the response and predictor variables). The P-value < 0.05 is an indication of a relationship between feedback and the predictor variables. Table 4.7, has P-Value $= 0.045 < 0.05$ which highlights a significant linear relationship between supply chain performance and supplier selection, e-procurement, lean supply, and supplier development. The 95% confidence infers that the predictor variables have a strong relationship with supply chain performance.

Table 4.7: Analysis of variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10.912	4	2.728	68.20	.045[a]
	Residual	1.680	42	.040		
	Total	12.592	46			

a. Predictors: (Constant), Supplier Selection, E-procurement, Lean Supply, Supplier Development

b. Dependent Variable: Supply Chain Performance
Source: Research data, (2016)

4.6 Enablers in Implementing Green Procurement

The last objective is to establish the elements that affect the adoption of GP by companies listed at the NSE. The findings are, on a scale of 1 to 5, where (1) very small extent (2) small extent (3) moderate extent (4) large extent (5) very large extent, the interviewees were required to point enablers in implementing green procurement. The scores of strongly disagree and disagree have been taken to represent a variable which had a mean score of 0 to 2.5 on the continuous Likert scale; ($0 \leq$ S.E<2.4). The scores of undecided have been taken to represent a variable with a mean score of 2.5 to 3.4 on the continuous Likert scale ($2.5 \leq$ M.E<3.4) and the score of both agree and strongly agree have been taken to represent a variable with a mean score of 3.5 to 5.0 on the continuous Likert scale; ($3.5 \leq$ L.E<5.0). A standard deviation of >0.9 implies a significant difference on the

enablers in implementing green procurement of the variable among the respondents. The enablers pointed out by the respondents includes the top management support with a (m=4.0, std=0.82). This shows that leadership is the key success to implementation of green procurement by the companies listed at the NSE. The finding concurs with the literature review of studies done by Klassen (2006) which noted that commitment by the leadership of business positively affected the orientation of the business towards green issues which agrees with similar studies conducted by Anis et al. (2013).

The government incentives and rewards with (m=3.6, std=0.7) shows that they enable the company to implement green procurement. The finding agrees with the findings of Jung et al. (2012) in their research on construction companies from China noted that support from the government was critical in companies going green. The other enablers includes government regulations with a (m=4.0, std=0.7), organization culture on green practices with (m=4.1, std=0.88), presence of new markets for green products with (4.0, std=0.89), adoption of environmental standards with (m=3.7, std=0,7), and appropriate risk management system (m=3.8, std=0.79). The government is a major enabler since it helps the companies listed at the NSE comply with the rules and regulations to implement the green procurement. The finding concurs with the literature review.

The appropriate technology with a (m=4.2, std=0.93) shows that green procurement gives a higher importance to technology. By using various technologies, which help in green procurement, the companies listed at the NSE can create a paperless society.

Also the voice of customer with (m=4.1, std=0.82) is the key enabler of green procurement implementation. The finding agrees with Berns (2009) who noted that the voice of the consumer is a key motivator for firms to review their green procurement commitments. Also the presence of new markets for green products with (m=4.0, std=0.89) will enable local distributors stock green products.

The collaborative partnerships with suppliers with (m=3.97, std=0.798) shows that green procurement is a vehicle for value creation. This involves creating synergies with stakeholders who are involved in creating value along the supply chain up to the end

consumer. The collaboration helps in cost cutting hence increased performance among the companies listed at the NSE.

Table 4.8: Enablers in Implementing Green Procurement

	Mean	Std dev
Appropriate technology	4.234	.9354
Voice of customer	4.120	.8211
Organization culture on green practices	4.072	.8789
Presence of new markets for green products	4.045	.8891
Top management support	4.034	.8167
Government regulations	4.021	.7123
Collaborative partnerships with suppliers	3.967	.7983
Appropriate risk management system	3.751	.7882
Adoption of environmental standards	3.738	.7031
Government incentives and rewards	3.613	.7131

Source: Research data, (2016)

4.7 Challenges in Implementing Green Procurement

The findings are, on a scale of 1 to 5, where (1) strongly disagree (2) disagree (3) undecided (4) agree (5) strongly agree, the respondents were asked to indicate the challenges faced in implementing green procurement. The scores of strongly disagree and disagree indicated a mean score of 0 to 2.5 on the continuous Likert scale; $(0 \leq S.E < 2.4)$. The scores of undecided indicated a mean score of 2.5 to 3.4 on the continuous Likert scale $(2.5 \leq M.E < 3.4)$ while that of both agree and strongly agree had a mean score of 3.5 to 5.0 on the continuous Likert scale; $(3.5 \leq L.E < 5.0)$. A std dev of >0.9 showed a significant difference on the challenges faced in implementing green procurement of the variable among the respondents. The challenges pointed out by the respondents in implementing green procurement includes lack of appropriate technology with (m=3.95, std=0.79). This indicates that lack of technology hinders preparation for tenders and sourcing of goods.

The finding agrees with Walker and Brammer (2009) who found out that absence of clear knowledge on environmetal matters affected negatively the procurement process in firms. Resistance from suppliers is another challenge identified, facing the implementation of green procurement with (m=3.7, std=0.8). This shows lack of available alternatives to the present product by the suppliers. The finding concurs with that of Genovese (2013) who noted that often times suppliers are not sincere with businesses, on their commitment to green issues. Also absence of corporate leadership support and lack of enough finances to support the implementation with a (m=3.8, std=0.9) and (m=4.2, std=0.7) respectively affects the green procurement. This indicates that for companies listed at the NSE the institutional leadership has to have a buy in on green matters.

Other challenges includes lack of internal competence and training on green procurement, high cost of green products and unavailability of green materials in the market with a (m=4.0, std=0.72), (m=4.1, std=0.79) and (m=3.7, std=0.8) respectively. This indicates that lack of training amongst the employees by the NSE companies affects the implementation of green procurement. The finding agrees with the literature review of Bouwer (2006) who noted that the competence of staff involved in adopting green strategies mattered.

Cost has also been sighted by scholars as challenge to GP particularly, when businesses are shifting from the old culture to green culture (Hoffman, 2008). Also lack of clear benefits from implementing green procurement with (m=3.5, std=0.63) affects the implementation of green procurement. The finding agrees with the literature review; where adoption of GP practices may not have monetary gains in the short term and therefore businesses may be reluctant to go green (Nidumolu, 2009).

Table 4.9: Challenges in Implementing Green Procurement

	Mean	Std dev
Lack of enough finances to support the implementation	4.231	.7016
High cost of green products	4.123	.7891
Lack of internal competence and training on green procurement	4.000	.7167
Lack of appropriate technology	3.945	.7893
Lack of top management support	3.841	.9124
Unavailability of green materials in the market	3.678	.7789
Resistance from suppliers	3.653	.8245
Lack of clear benefits from implementing Green Procurement	3.500	.6271
Lack of metrics (KPI) to measure and monitor performance	3.451	.6753
Lack of government incentives in implementing green procurement	3.035	.5515

Source: Research data, (2016)

CHAPTER FIVE: SUMMARY OF THE FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

Chapter five a summary of findings, adoption of green procurement practices, impacts of adopting green procurement practices on supply chain performance, challenges faced in the implementation of green procurement, conclusion, recommendations, implications of the study on policy, theory and practice, limitation of the study, and suggestion for more research.

5.2 Summary of the Findings

The findings of the study revealed that companies listed at the NSE adopt specific green procurement practices in management of their operations that are aligned to its corporate strategy in running its supply chain function. Green procurement has significantly contributed to the performance and hence creating competitive edge of listed companies by focusing on operational efficiencies and effectiveness.

The results concur with the literature review of research done in other organizations. With the current uncertainty, sporadic business environment and stiff competition coupled with a very knowledgeable customer, companies listed at the NSE are turning inward, tapping as much value from their core competencies to establish a sustainable competitive edge through operational effectiveness and efficiency to improve the supply chain performance.

The findings of the study indicated that companies listed at the NSE adopt various green procurement practices in their operations to enhance their performance and hence creating competitive edge. The practices adopted includes supplier selection that helps the companies to improve its performance. E procurement is another practice adopted that ensures the procurement process is automated, creating a paperless environment. From the study, lean supply is adopted by the companies. A lean supply chain is devoid of wastes and a suitable driver for process efficiencies. Companies with a lean supply chain are able to incorporate green procurement aspects in their supply chain system and

therefore position the supply chain as a value driver in the business. Supplier development is also practiced and it enables the exchange of information that improves the performance of the organization.

5.3 Conclusion

From the results of the study and the forgoing discussions, it is clear that there is a strong connection between green procurement practices and strategies that have contributed to good performance within the operation and supply chain and conversely impacting on the companies listed at the NSE overall supply chain performance and its competitive strength in the challenging business environment.

The study revealed that the companies listed at the NSE are starting to acknowledge the importance of implementing environmental and social aspects. It is observed that the current trend in procurement is moving towards synergies between procurement function and green suppliers on green product initiatives and information exchange on green procurement practices.

The study concludes that implementation of green procurement practices increases the supply chain performance. The performance is reflected through improved customer service, minimized ordering costs, and reduced inventory stock. This shows that green procurement practices have been adopted by the listed companies and realigned to the corporate strategies that has enabled them to achieve a competitive edge.

Companies listed at the NSE faced various challenges while implementing green procurement practices. The main challenges included; lack of top management support, supplier resistance and high cost of green products among others. This study shows that there is need for availability of more information on green products and services within the organization and availability of adequate resources for implementing green procurement. This situation creates ambiguity in acceptance of green products and services and thus affecting performance levels.

Companies listed at the NSE have managed to consolidate and sustain their market leadership position over the years as confirmed by the findings of this study. The adoption of various green procurement practices have impacted positively on the supply chain and operational performance and consequently on building operational efficiency.

Green procurement is a source of creating competitiveness and hence the move by some companies to implement the green procurement practices has improved their performance, reflected through increased transparency in procurement process and frequent exchange of information with suppliers.

5.4 Recommendations

Government, regulatory bodies/entities, established institutions and industry associations should take authority to establish sustainable procurement guidelines, references standards and codes for interested parties. The bodies can support sustainable procurement through more regulations, training opportunities for staff, standards and code of practices.

The implementation of green procurement requires actions and participation from all levels of stakeholders. Therefore a collaborative approach between the procurement team and the end user/customer is the best set up for sustainable procurement. In tandem with these efforts, the top management should put in place additional measures to encourage asset owners and facilities managers to consider green procurement practices to improve sustainability performance.

Green procurement needs to be embraced to help the management team appreciate the direct effect on the performance of the supply chain. Adoption of flexible green procurement practices through appropriate research will help the business meet diverse yet drastic changing needs as well as address challenges arising from a dynamic global business environment. Management should embrace both qualitative and quantitative aspects in their decision making on green procurement practices and strategies, which should be integrated across the organization.

5.5 Implications of the Study to Policy, Theory and Practice

The green procurement practices, evident from the study, reflects how they link with corporate strategy to yield improved supply chain performance and hence creating competitive advantage. To achieve effective adoption of the various green procurement practices, it requires clear policies to be formulated, implemented and monitored to ensure they remain relevant to the business.

The theory, as discussed in the literature review, is such that organizations that adopt sound green procurement practices outperform those that do not and indeed the gap keeps widening as such companies continue to innovatively implore fresh green procurement practices. With the globalization and stiff competition, companies need to proactively and innovatively invest in appropriate green procurement practices to realize superior supply chain performance.

5.6 Limitations of the Study

The study faced several limitations. First, resource constraint was a major challenge. Due to financial constraints, the study was under-powered, and thus, did not reach optimum statistical significance, by obtaining maximum response rate.

Secondly, there was limited access to information. There was lack of response from some of the targeted respondents. Others failed to return the questionnaires claiming that they had no time to fill them, while others argued that it was against the company's policy to disclose information relating to their organization.

Thirdly, the study focused on companies listed at the NSE therefore, the results might not be conclusive for companies not listed at the NSE.

5.7 Areas of Further Research

The study sought to explore the green procurement practices and supply chain performance of companies listed at the Nairobi Securities Exchange. The study recommends for an in-depth study should be carried out on factors influencing adoption of Green procurement in companies listed at the Nairobi Security Exchange.

The study recommends further research to be carried out in other sectors of the Kenyan economy for contrast with similar research and to allow for conclusion of findings on the implementation of green procurement in Kenya.

REFERENCES

Blomea, C., Hollos, D. & Paulraj, A. (2013). GP and green supplier development: antecedents and effects on supplier performance. *International Journal of Production Research,* 52(1), 32-49.

Bowen, F.E., Cousins, P.D., Lamming, R.C., & Faruk, A.C. (2001). The role of supply management capabilities in green supply. *Production and Management Journal.*10 (2), 174-189.

Brammer, S. & Walker. (2011). Sustainable procurement in the public sector: an international comparative study. *International Journal of operations and Production Management*. 31(4), 452 – 476.

Caniëls, M.C., Gehrsitz, M.H. & Semeijn, J. (2013). Participation of suppliers in greening supply chains: An empirical analysis of German automotive suppliers. *Journal of Purchasing and Supply Management,* 19(3), 134-143.

Carvalho, H. and Cruz-Machado, V. (2009). Integrating Lean, Agile, Resilience and Green Paradigms in Supply Chain Management (LARG_SCM); *Proceedings of the Third International Conference on Management Science and Engineering Management*, 3-14.

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

Cousins, & Lamming. (2012). Strategic Supply Management: Principles, Theories and Practice. *Prentice Hall Financial Times*, ISBN 0273651005.

Field, A. (2005): *Discovering Statistics Using SPSS*, 2nd ed., Sage, London.

Gimenez, C., Tachizawa, EM. (2012) Extending sustainability to suppliers: a systematic literature review. *Supply Chain Management International Journal,* 17, 531–543.

Giunipero, L.C., Hooker, R.E. & Densloe, D. (2012). Purchasing and supply management sustainability: Drivers and barriers. *Journal of Purchasing and Supply Management*, 18(4), 258-269.

Guenther, E., Scheibe, L. & Farkavcova, V.G. (2010). The hurdles analysis as an instrument for improving sustainable stewardship. *Management Research Review*. 33(4), 340-356.

Harland, K.W., Claudia, K. (2001). Environmental management policies, in Sarkis, (Eds), Green Manufacturing and Operations: from Design to Delivery and Back, *Greenleaf Publishing, Sheffield*, 192-204.

Henriques, I. & Sadorsky, P. (1999). The relationship between environmental commitment and managerial perceptions of stakeholder importance. *Academy of Management Journal*, 42(1), 87-99.

Hiew, J.F. (2005), Multivariate Data Analysis: A Global Perspective, Pearson Education Inc., NJ.

Hussain, M. (2011). Modelling the enablers and alternatives for sustainable supply chain management. *Unpublished MBA thesis,* Concordia University, Canada.

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

Klassen, R.D. & Vachon, S. (2003). Collaboration and evaluation in the supply chain: the impact on plant-level environmental investment. *Production and Operations Management,* 12(3), 336-353.

Lamming, R. (1996). Squaring lean supply with supply chain management, *International Journal of operating and Production Management*, 16(2), 183-96.

Lee, S.Y. & Klassen, R.D. (2009). Drivers and enablers that foster environmental management capabilities in small-and medium-sized suppliers in supply chains. *Production Operation Management,* 17, 573–586.

Min, H. & Galle, W. (2001). Green purchasing strategies: trends and implications. *International Journal of Purchasing and Materials Management*, 4, 10-17.

Mollenkopf, D., Stolze, H., Tate, W.L., & Ueltschy, M. (2010). Green, lean, and global supply chain; *International Journal of Physical Distribution and Logistics Management*, 40(1/2), 14-41.

Mugabe, Y. A. (2013). Green management practices and supply chain performance of pharmaceutical companies in Nairobi, Kenya. *Unpublished MBA project UON.*

Nasiche, F. & Ngugi, G. K. (2014). Determinants of adoption of green procurement in the public sector: a case study of Kenya Pipeline Company. *International Journal of Social Sciences and Entrepreneurship*, 1 (11), 351-372.

Nijaki, L.K. & Worrel, G. (2012). Procurement for sustainable local development. *International Journal for Public Sector Management,* 25(2), 133-153

NSE. (2014). Nairobi Securities Exchange Annual Report, 2014.

Pallant, J. (2005). SPSS survival manual: a step guide to data analysis using SPSS for windows (Version. 12). New York (2nd.). *Open University Press.*

Preuss, L. (2009). Addressing sustainable development through public procurement: the case of local government. *Supply Chain Management,* 14(3), 213.

Salam, M.A., (2008). Green procurement adoption in manufacturing supply chain. *Proceedings of the 9th Asia Pacific Industrial Engineering and Management Systems Conference (APIEMS2008), Indonesia,* 1253-1260.

Simpson, D.F. & Power, D.J. (2005). Use the supply relationship to develop lean and green suppliers; supply chain management. *An International Journal*, 10(1), 60-68.

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

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

Zhu, Qinghua, Geng, Yong. (2004). Study on factors of green supply chain management among chinese manufacturers. *Chinese Journal of Management Science*, 12(3), 81-85.

Zsidisin, G.A. & Siferd, S.P. (2001). Environmental purchasing: a framework for theory development, *Eur. J. Purchasing Supply Management,* 7, 61-73.

APPENDICES:
APPENDIX I: QUESTIONNAIRE

This questionnaire is intended to provide information for the study on green procurement practices and supply chain performance of companies listed at the Nairobi Securities Exchange. Please note that the information provided will be used for academic purpose only and will be treated with utmost confidentiality.

Kindly answer the following questions by ticking (√) in the appropriate box or by giving the necessary details in the spaces provided.

SECTION ONE: General Information of the Company

1. Position of Respondent

   (   ) Supply Chain Manager (   ) Operations Manager   (   ) Supply Chain/Operations Officer

   Other (specify)…………………………………………………………

2. How long have you been in this position?

   (   ) Less than 5 years   (   ) 5 to 10 years   (   ) 10 to 15 years

   (   ) Above 15 years

3. Highest educational level of Respondent

   (   ) Bachelor   (   ) Master   (   ) Doctorate

   Other (specify)………………………………………………………….....

4. Gender

   (   ) Male   (   ) Female

5. How can you describe ownership of your company: please tick appropriately inside the box.

   Local   (   )   Foreign   (   )   Both   (   )

6. Annual company turnover (Ksh.)

   Up to 50 million (   )   51 to 1 billion (   )   Over 1 billion (   )

SECTION TWO: The Extent of Green Procurement Practices

7. Listed below are some of the attributes of the Green Procurement practices adopted by firms. Please rank by a tick in the appropriate box the extent to which they are practiced using the following rating; 5 = to a very large extent, 4 = Large extent, 3 = Moderate extent, 2 = Small extent, 1 = Very small extent

Supplier Selection	5	4	3	2	1
Green designed products					
Green Materials (recycle, re-use, reduce, re-furbish)					
Green packaging material					
Energy conservation					
Reduction in use of harmful substance					
Suppliers to have ISO 14001certification					
E-Procurement					
Electronic supplier database					
e-sourcing (soliciting of bids)					
e-bidding (reverse auction)					
e-evaluation of bids					
e-payment					
Electronic information exchange with suppliers					
Lean supply					
Eliminating delays in delivery					
Avoiding overstocking					
Appropriate use of transport mode					
Avoiding over processing					
Decreasing defects					
Supplier Development					
Supplier relationship management					
Supplier investments (financial, machinery, technology)					
Supplier visits					
Frequent communication on green procurement KPI's					
Supplier trainings					
Rewards/Awards for improvements					

8. Any other …………………………………………………………….

SECTION THREE: Relationship between Green Procurement Practices and Supply Chain Performance Measurement.

9. Please state the relationship between green procurement practices and performance of supply chain in your company. Kindly tick appropriately. Use the scale of: 5= To a very large extent 4= Large extent 3= moderate extent 2= small extent 1=very small extent

Green Procurement Practices and Supply Chain Performance	5	4	3	2	1
1) Supplier Selection has led to;					
Increased quality of environmental friendly supplies					
Improved accuracy of orders received					
Improved customer service					
Reduced environmental expenses					
Improved public image of the company					
2) E-Procurement has led to;					
Minimized ordering cost					
Increased flexibility in ordering					
Increased on time order processing					
Short supplier response time					
Increased transparency in procurement process					
3) Lean Supply has led to;					
Reduced inventory stock					
Increased supply chain efficiency					
Increased timeliness of delivery					
Minimized inbound logistics cost					
Minimized defects and rejects					
Frequent exchange of information with suppliers					

4) **Supplier Development has led to;**					
Savings from sourcing green products					
Improved supplier relationship					
Increased stability of supplies					
Reduced total cost of owning supplies					
Reduced customer complains					
Increased compliance with environmental laws					

10. Any other? ………………………………………………………………………

SECTION FOUR: Enablers in Implementing Green procurement

11. Please indicate the extent which the following factors enable implementation of green procurement practices in your organization. Kindly tick appropriately. Use the scale of: 5= to a very large extent 4= Large extent 3= moderate extent 2= small extent 1=very small extent

No.	Enablers in Implementing Green Procurement	5	4	3	2	1
1	Appropriate technology					
2	Collaborative partnerships with suppliers					
3	Government regulations					
4	Top management support					
5	Government incentives and rewards					
6	Voice of customer					
7	Appropriate risk management system					
8	Adoption of environmental standards					
9	Organization culture on green practices					
10	Presence of new markets for green products					

12. Any other? …………………………………………………………………

SECTION FIVE: Challenges in Implementing Green Procurement

13. Listed below are some of the challenges/ barriers which prevent firms from adopting Green Procurement practices. Please rank by a tick in the appropriate box the extent to which you agree with these challenges using the following rating; 5 = strongly agree, 4 = Agree, 3 = Undecided 2 = Disagree, 1 = Strongly Disagree.

No.	Challenges in Implementing Green Procurement	5	4	3	2	1
1	Lack of appropriate technology					
2	Resistance from suppliers					
3	Lack of enough finances to support the implementation					
4	Lack of top management support					
5	Lack of internal competence and training on green procurement					
6	Lack of clear benefits from implementing Green Procurement					
7	Lack of metrics (KPI) to measure and monitor performance					
8	Lack of government incentives in implementing green procurement					
9	Unavailability of green materials in the market					
10	High cost of green products					

14. Any other ………………………………………………………….

<div align="center">Thank you</div>

APPENDIX II: COMPANIES LISTED AT THE NSE AS AT MARCH 2016

SECURITIES	TOTAL No. OF SHARES ISSUED
AGRICULTURAL	
Eaagads Ltd	32,157,000
Kakuzi Ltd	19,599,999
Kapchorua Tea Co. Ltd	3,912,000
The Limuru Tea Co. Ltd	1,200,000
Rea Vipingo Plantations Ltd	60,000,000
Sasini Ltd	228,055,500
Williamson Tea Kenya Ltd	8,756,320
AUTOMOBILES and ACCESSORIES	
Car and General (K) Ltd	40,103,308
Marshalls (E.A.) Ltd	14,393,106
Sameer Africa Ltd	278,342,393
BANKING	
Barclays Bank of Kenya Ltd	5431536000
CFC Stanbic of Kenya Holdings Ltd	395321638
Diamond Trust Bank Kenya Ltd	242110105
Equity Bank Ltd	3702777020
Housing Finance Co.Kenya Ltd	235750000
IandM Holdings Ltd	392362039
Kenya Commercial Bank Ltd	2984227692
National Bank of Kenya Ltd	280000000
NIC Bank Ltd	597282563
Standard Chartered Bank Kenya Ltd	309159514
The Co-operative Bank of Kenya Ltd	4889316295
COMMERCIAL AND SERVICES	
Express Kenya Ltd	35,403,790
Hutchings Biemer Ltd	360000
Kenya Airways Ltd	1496469035
Longhorn Kenya Ltd	58500000
Nation Media Group Ltd	188542286
Scangroup Ltd	378865102
Standard Group Ltd	81,731,808
TPS Eastern Africa Ltd	182,174,108
Uchumi Supermarket Ltd	265,424,636

CONSTRUCTION and ALLIED	
ARM Cement Ltd	495,275,000
Bamburi Cement Ltd	362,959,275
Crown Paints Kenya Ltd	23,727,000
E.A.Cables Ltd	253,125,000
E.A.Portland Cement Co. Ltd	90,000,000
ENERGY and PETROLEUM	
KenGen Co. Ltd	2,198,361,456
KenolKobil Ltd	1,471,761,200
Kenya Power and Lighting Co Ltd	1,951,467,045
Kenya Power and Lighting Ltd 4% Pref 20.00	1,800,000
Kenya Power and Lighting Ltd 7% Pref 20.00	350,000
Total Kenya Ltd	175,028,706
Umeme Ltd	1,623,878,005
INSURANCE	
British-American Investments Co.(Kenya) Ltd	1,938,415,838
CIC Insurance Group Ltd	2,615,538,528
Jubilee Holdings Ltd	59,895,000
Kenya Re Insurance Corporation Ltd	699,949,068
Liberty Kenya Holdings Ltd	1,030,540,728
Pan Africa Insurance Holdings Ltd	96,000,000
INVESTMENT	
Centum Investment Co Ltd	665441775
Olympia Capital Holdings Ltd	40000000
Trans-Century Ltd	280,284,476
INVESTMENT SERVICES	
Nairobi Securities Exchange Ltd Ord 4.00	194,625,000
MANUFACTURING and ALLIED	
A.Baumann and Co Ltd	3,840,066
B.O.C Kenya Ltd	19,525,446
British American Tobacco Kenya Ltd	100,000,000
Carbacid Investments Ltd	254,851,988
East African Breweries Ltd	790,774,356

Eveready East Africa Ltd	210,000,000
Kenya Orchards Ltd	12,868,124
Mumias Sugar Co. Ltd	1,530,000,000
Unga Group Ltd	75,708,873
TELECOMMUNICATION and TECHNOLOGY	
Safaricom Ltd	40,065,428,000
GROWTH ENTERPRISE MARKET SEGMENT (GEMS)	
Flame Tree Group Holdings Ltd Ord 0.825	161,866,804
Home Afrika Ltd	405,255,320

Source: Nairobi Securities Exchange (2016)