

**SUSTAINABLE PROCUREMENT AND SUPPLY CHAIN
AGILITY OF THE COUNTY GOVERNMENTS IN KENYA**

BY

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DECLARATION

This project is my work that is original and has never been provided in any other institution for any award.

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This research has been submitted to the university with my endorsement as the student's supervisor.

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DEDICATION

This research project is dedicated to my entire family. To my parents, special thanks for bringing me up and making me who I am. To my loving wife and children, you are special for you tirelessly supported me in this exercise amidst several challenges. May God bless you.

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ABBREVIATIONS AND ACCRONYMS

CIPS	Certified Institute of Procurement Studies
CoK	Constitution of Kenya
COVID-19	Coronavirus Disease 2019
DEFRA	Department for Environment, Food and Rural Affairs
GDP	Gross Domestic Product
ICT	Information Communication Technology
RBV	Resource Based View
SP	Sustainable Procurement
SPP	Sustainable Procurement Practices
SPSS	Statistical Package for Social Sciences
SPTF	Sustainable Procurement Task Force
TOE	Technology-Organization-Environment Theory
UNEP	United Nations Environmental Programme
WSSD	World Summit on Sustainable Development

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ABSTRACT

This study aimed at establishing the influence of sustainable procurement and supply chain agility of the county governments in Kenya. The objectives that guided the research include; to determine the extent of adoption of sustainable procurement by the county governments in Kenya and to establish the relationship between sustainable procurement and supply chain agility of the county governments in Kenya. The study adopted descriptive research design. The study was census of all the county governments (47) in Kenya which constituted the population. The primary data was collected through questionnaires sent via e-mails while some through drop and pick later method. The data was analyzed by descriptive statistics (objective one) and regression analysis (objective two). The outcome indicates that green purchasing, ICT adoption and eco design and packaging were adopted to a large extent whereas supplier partnerships and ethical procurement were adopted to a moderate extent, as per their means, by the county governments in Kenya. The findings also show that sustainable procurement influences supply chain agility of the county governments in Kenya as indicated by the p values lower than 0.05. More specifically, green purchasing, supplier partnership, adoption of ICT, ethical procurement and eco design and packaging influences supply chain efficiency, supply chain responsiveness and supply chain agility in general. The study recommends that the managers at the county governments must adopt sustainable procurement practices (green purchasing, supplier partnership, adoption of ICT, ethical procurement and eco design and packaging) if they need to enhance their supply chain agility (supply chain efficiency and supply chain responsiveness). It is suggested that future studies should focus on sustainable procurement and supply chain agility of either manufacturing firms, Banking sector, Agrochemicals, Pharmaceuticals or even Multinational corporations. This will help in knowing whether the studies will yield the same results.

CHAPTER ONE: INTRODUCTION

1.1 Background of the study

Due to globalization, there has been increased competition, scarcity of resource, need for efficiency and effectiveness, increased demand for environmental protection and changes in customer's preferences and tastes (Muller, Dosantos & Seuring, 2009). This has posed a lot of challenges to organizations and they are trying to come up with ways of averting these milestones. Sustainability has a vital part in ensuring that the integrity of any given brand is maintained while being able to manage the agility of supply chain of an entity to ensure that there is continuity as observed by Muller et al. (2009). Thus, design of materials to be procured and procurement of materials should be in a way that it's sustainable and can help achieve supply chain agility of an organization. Sustainability concept has become relevant in public procurement as entities respond to external and internal pressures (Nair & Chisoro, 2015). Babiak and Trendafilova (2011) opine that pollution of water and air, global warming and ozone layer and deficiencies of resource are as a result of environmental degradation which has increased attention on sustainability all over the world. Porter and Van der Linde (1995) posit that sustainable procurement plays an important part in ensuring that an entity avoids cost of litigations, increases demand for the product and lead to service delivery.

Sustainability entails merging of environmental, social and economic activities to be able to meet the present generation requirements deprived of necessarily interfering with the needs of the subsequent one as observed by Elkington (2004). Sustainable procurement is the application of principles of developing sustainability across the procurement function (Seuring & Muller, 2008). Sustainability in procurement is not only concerned with being green as it is also about ensuring procurement is responsible socially and ethically in purchasing, reducing supply chain effect on the environment and providing sound economic solutions through good business practices as explained in the Certified Institute of Procurement Studies Manual (2014). Sustainable procurement is based on the sustainable development concept although sustainable procurement focus is wider to just development as it focuses on realizing the needs of all the future and existing communities, enhancement of personal wellbeing, creating equal opportunities, inclusion and social cohesion as explained in the Sustainable Supply Chain Foundation Report (2014).

This research was based on a number of theories that explain the environment where organizations operate and means by which sustainable procurement practices can be aligned to fit in ensuring that agility is achieved. These theories include Technology-Organization-Environment Theory (TOE), Resource Based View Theory and Dynamic Capability Theory. In 1990, Thornatzky and Fleischer developed TEO and it identifies the characteristics of technology, the firm's readiness and conditions of the environment as significant technology drivers for adoption. The resource Based View is based on an organization's individual assets and their ability as well as the availability of mechanisms for isolation as the principal determinants of performance in an organization (Walker, 2015). Dynamic Capability theory focuses on manipulating existing external and internal firm specific competencies to address the ever-changing environment in which firms operates as explained by Ahmed and Wang (2007)

1.1.1 Sustainable Procurement Practices

Sustainable procurement considers the Social financial and environmental factors in decision making in the procurement function (Srivastara, 2007). Srivastara (2007) further explains that sustainable procurement looks past the economic measures traditionally used and makes conclusions basing on whole life costing, related risk, success measure and societal implications along with environmental considerations. Sustainable procurement has become an essential agenda in governments which seek to demonstrate they have adopted sustainable development (McMurray, Islam, Siwar & Fien, 2014). Sustainable Procurement does not focus only on the green element but is about the social, ethical accountability that ensures reduction in the effect to the environment supply chains bear and ensure resolutions that are economically sound, while ensuring good business practice as explained by the Sustainable Supply Chain Foundation Report (2014). The research adopted the Sustainable Procurement Task Force Definition (SPTF). The Marrakech Task Force on Sustainable Public Procurement was established by the state secretary for Ecology in United Kingdom and principal secretary of treasury with an aim of development of a national plan of action in UK for sustainable procurement to make UK a leader in EU by 2009 in SP as given by the Department for Environment, Food and Rural Affairs Report (2005). The Task Force defines Sustainable procurement as;

“The procedure where companies realize their needs for works, services and goods, and conveniences in a manner that results to realization of worth for cash on whole some ground by

creating paybacks to the firm, Community and economy while reducing the environmental damage”

Sustainable Procurement Practices are practices concerned with being green as well as ensuring procurement is responsible socially and ethically in purchasing, reducing supply chain effect on the environment and providing sound economic solutions through good business practices (Elkington, 2004). Brammer and Walker (2007) note that sustainable procurement practices like green sourcing, E-procurement and paying suppliers on time have the ability to transform markets, foster the creation of jobs, financial viability enhancement, enhance the competitive nature of eco-industries that enhances sustainable development in business (Srivastara, 2007) lists some of the Sustainable Procurement Practices namely; Green procurement, ecological packaging and labeling, partnership with suppliers and customers, promptly paying suppliers, Incorporating ICT in procurement and being Ethical while procuring. The study adopted these practices.

1.1.2 Supply Chain Agility

To gain a competitive advantage in a changing business environment, companies should align with suppliers and customers, as well as their institutions, and collaborate for an acceptable level of agility (Chen, 2019). As a result, an agile supply chain is formed. An agile supply chain can respond to workplace changes in a timely and effective manner (Aslam, Khan, Rashid & Rehman, 2020). Agility is defined as the ability to detect and respond to market dynamics quickly (Gligor, Bozkurt, Gölgeci, & Maloni, 2020). As a result, Aslam, Khan, Rashid, and Rehman define agility as an organization's ability to respond quickly to changes in demand, both in terms of volume and variety, and it is all about customer responsiveness, market turbulence, and the need for specific capabilities (2020). Dubey, Bryde, Foropon, Tiwari, Dwivedi, and Schiffing (2021) redefined agility as the ability of an organization to evolve products and services quickly and economically in response to customers' dynamic demands, and they have focused on increasing velocity and flexibility in the supply chain to reduce waste and avoid customer dissatisfaction. They also proposed agility performance measures such as product quality, product innovation, and process innovation, all of which are geared toward flexibility and reduced lead times.

Supply chain agility is defined by Shukor, Newaz, Rahman, and Taha (2020) as a firm's ability to quickly adjust its supply chain tactics and operations, whereas Al-Zabidi, Rehman, and Alkahtani (2021) define it as the ability to rapidly respond to unpredictable changes in supply or demand.

More specifically, Aslam, Blome, Roscoe, and Azhar (2018) define supply chain agility as the firm's ability to detect short-term, temporary changes in the supply chain and market environment (e.g., demand fluctuations, supply fluctuations, changes in suppliers' delivery times) and respond to those changes quickly and flexibly within the existing supply chain (e.g. reducing replacement times of materials, reducing manufacturing throughput times, adjusting delivery capacities).

As a result, an agile supply chain necessitates a variety of distinguishing characteristics. These capabilities are comprised of four major components (Aslam, Blome, Roscoe & Azhar, 2018; Dubey, Gunasekaran & Childe, 2019; Jermisittiparsert & Wajeetongratana, 2019) responsiveness, defined as the ability to detect and respond to changes quickly, reactively, or proactively, as well as recover from them; Efficiency is the ability to realize organizational objectives and utilize a firm's resources in an efficient and effective manner; flexibility is the ability to implement different processes and apply different facilities to achieve the same goals; and quickness is the ability to complete an activity as quickly as possible. The study thus adopted the aforementioned supply chain agility measures by examining how sustainable procurement influences supply chain agility through responsiveness and efficiency.

1.1.3 County Governments in Kenya

The county governments of Kenya is a conception of the 2010 Kenyan Constitution that is the actualization of devolved units as envisioned in the constitution which created the 47 County Governments under Articles 191 and 192 in the 4th schedule (GoK, 2010) which was further reinforced by the County Government Act of 2012. The county governments have the mandate of executing development activities in partnership with the national government through an annual budget (Miheso, 2013). The functions of the county government include legislations, executive functions and duties reassigned from the state government and staffing of public servants at the county level. The counties handle various devolved functions including agriculture, health, advertising control, culture, education, childcare, animal control, transport, policy implementation and coordination (Nga`nga, 2011).

County government procurement is responsible for 20-30% of GDP, implying that the necessity to embrace Sustainable Procurement cannot be understated (Thai & Grimm, 2000). County governments make use of a sophisticated contractual system that would be developed to guard their interest with the view to guarding the accountability and transparency of services (Rasheed,

2004). The County government plays an important role in coordinating and guaranteeing that communities participate in governance matters under the county government. The county government is vital as it provides working opportunities to the native community, provide protection and ensure that all the residents of the community have protection and administers health and welfare services (Were, 2017).

Despite the budget allocation on annual basis, performance of devolved governments is still a significant challenge because of the misappropriation of the financial resources and ineffective internal control mechanisms. Implementation of Sustainable Procurement practices at the county level requires support from the National government and the county government as well. Lack of funds makes it difficult for the county level to be able to be sustainable as some of the green materials are expensive in the short run as compared to the substitutes (Walubengo, 2013). 15% of the National Revenue allocation to counties may not be enough to enable them fully implement and adopt Sustainable initiatives. The County governance also face Governance problem such as political will to transform development programs into sustainable development goals (Carlton, 2014). Investment in Technology and training is also an issue as going green requires massive capital set up which might be challenging for the County governments to pull together the funds. Ngigi and Busolo (2019) identified some of the benefits of devolution including; improved service delivery, enhanced financial management, brought equality to all regions, better health care to the locals, Balances country's economic development, Brings the government closer to the governed and the public's involvement in governance of counties is perceived to be increasing the confidence of the public as well as projects of development which address the needs of locals

1.2 Research Problem

Sustainable Procurement has gained massive interest from the public as well as the Private sector as it has been established to influence a firms performance, gives it a competitive edge over the competitors as well as enhancing agility (Raj, Agrahari & Srivastava, 2020). The adoption of sustainable procurement has been found to have many benefits like cost minimization, utilization of resources, waste minimization, efficient communication and timely delivery of products and services. Entities that needs to meet supply chain agility goals are therefore encouraged to adopt sustainable procurement practices.

Public procurement is a vital facet of service delivery for public institutions in developed and developing countries as it is about the share of the country's entire expenditure (Basheka & Bisangabasaji, 2010). The increase in concerns of ecology and natural contamination consciousness in line with modern improvement need to be taken core by adoption of sustainable procurement practices (Sheu, Chou & Hu, 2005). The decentralized government are determined to enhance supply chain agility in their supply chains by adopting programs that guarantee reforms such as Adoption of ICT and procuring through IFMIS, advertising tenders through gazette and publishing the list of qualified bidders and awarded contracts for all to see which enhance responsiveness, an responsible as well as transparency of the county's financial resources to better enhance quality and realize the objectives in development (Aruasa, 2018). The County Governments have however been faced with challenges of graft allegations and misappropriating of public funds due to procurement practices which are not sustainable. The Counties are also spending a lot of public funds in the procurement and thus sustainable Procurement is needed to help reduce the cost of expenditure and seal the loopholes for misappropriation of funds.

Numerous researchers have studied Sustainable Procurement both locally and on global front. Globally, Zaidi, Mirza, Hou and Ashraf (2019) focused on sustainable development through sustainable procurement and established that Sustainable procurement enhances sustainable development goals of Pakistani university. Mukherjee (2019) analysed Sustainable Procurement of Developing Countries in Small and Medium Enterprises and developing countries were found to have a growing trend for sustainable development. Filho et al. (2019) focused on procurement practices and sustainability in higher institutions of learning. It was established that sustainable procurement minimizes harmful ecological and social effects while enhancing speed and quality service delivery. Vluggen, Gelderman, Semeijn and Van Pelt (2019) did a research on Sustainable Public Procurement—External Forces and Accountability. It was determined that Sustainable procurement influenced accountability and transparency in the procurement process as well as enhancing customer satisfaction.

Locally, Wanja and Achuora (2020) carried out a study on Performance of Procurement and Sustainable Procurement in Kenyan Food and Beverages Manufacturing Sector. It was established that sustainable procurement reduced procurement cost and improved service delivery with green purchasing having a large influence on performance. Oduor (2019) on performance and Sustainable SCM Practices established that Green Purchasing, Information Sharing and Reverse

Logistics enhanced Speed, Quality and saved Cost. Chogo and Kitheka (2019) on the firms Performance and Sustainable Procurement noted that sourcing locally, eco-packaging, backward logistics and implementation of ICT had an affirmative substantial influence on organizational performance. Aila and Ototo (2018) studied on the concept of Sustainable procurement with intent of figuring out if it all adds up. It was concluded that entities have incorporated sustainability in the processes of sourcing but the balancing is absent. Sustainable procurement also plays a critical role of minimizing negative effect to the ecology, delivery of service, minimized cost, quality service and products to guarantee competitive edge of the firm.

From the above studies, it can be concluded that no known study has been carried out on sustainable procurement and supply chain agility at the county governments of Kenya. As a result, the goal of our research was to bridge that gap. The study's purpose was to determine the correlation between sustainable procurement practices and supply chain agility in Kenya's county governments. The research sought to find responses to the following queries. What is the extent of adoption of sustainable procurement practices by the county governments of Kenya? and What is the relationship between sustainable procurement practices and supply chain agility at the county governments of Kenya?

1.3 Research objectives

The main objective of the research;

To establish the influence of sustainable procurement practices on supply chain agility at the county governments of Kenya.

The specific objectives were;

- i. To ascertain the extent of adoption of sustainable procurement practices at the county governments of Kenya.
- ii. To establish the correlation between sustainable procurement practices and supply chain agility at the county governments of Kenya.

1.4 Value of the study

The results shall be instrumental to government entities especially County Governments, in linking their public supply chain agility with sustainable procurement practices. In Kenya, it is a

requirement by the National Treasury that all government entities implement sustainable procurement practices therefore the study will promote government regulatory compliance by public entities.

Other than public entities, the outcome may be imitated by different organizations in improving supply chain agility. The study will inform decision making by managers in various organizations and will help them in implementing practices of sustainable procurement practices at their various institution once they establish that its one way of improving agility along the supply chain.

The study aims at adding onto the existing knowledge on supply chain agility and sustainable procurement practices. The findings and recommendations will help in providing conclusion which will be vital to the supply chain practitioners, professionals and students. Sustainable procurement practices and its effect on agility in supply chains is not exhaustively covered hence this will facilitate scholars and students in Universities in to collecting information which would benefit the whole economy and the globe as well as further the discussions on this and related subjects through the suggestions for upcoming research.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This part is on literature review of the previous studies associated with supply chain agility and sustainable procurement as per the objectives of the study. It also expounds on the individual sustainable procurement practices that the study focused on, the relevant theories underpinning the research and the conceptual Model.

2.2 Theoretical Framework

The part is about the theories which are responsible for guiding the study. The study was steered by Technology-Organization-Environment Theory (TOE), Resource Based View Theory (RBV) and Dynamic Capability Theory.

2.2.1 Technology-Organization-Environment Theory

Technology-Organization-Environment Theory was established in 1990 by Thornatzky and Fleische and it recognizes the technological features, readiness of the organization and conditions in the environment as being the significant drivers in the adoption of technology. The theory tries to explain the diverse fundamentals of a company's context that affects the results of adopting Technology (Grover 1993; Mishra et al. 2007). TOE is defined by Zhu and Kraemer (2005) as the procedure through which organizations adopt and implement innovations in technology and is affected by the technology, the organization and environment around it. Based on DePietro, Wiarda and Fleischer (1990), technology may be equipment and or processes. The context of the organization is the characteristics and firms' resources that include the size, centralization degree, formalization degree, structure of management, human resource and level of resources. The context of environment entails the structure and size of the industry, competition, context of macro economy and regulation framework (DePietro et.al., 1990). They present both opportunities and drawbacks to innovation in technology (Chau & Tam, 1997), as a result, they affect the manner in which an organization identifies the needed for, conducts a search and adopts new innovation in technology.

This theory is relevant to sustainable procurement as incorporating technology into the procurement process like electronic procurement helps the firm in being sustainable by reducing

time used in the procurement process and eliminating the paperwork involved which is produced by tree cutting. The theory also factors in the environment that the firm is operating on and thus helps in conserving it. The theory helps in understanding factors that affects the implementation of technology by firms and thus aids in making better decisions and having agile supply chains.

2.2.2 Resource Based View Theory

Basing on this theory, organizations which own resources that are strategic in nature have important competitive edge over organizations that do not. Strategic resource are resource that can be considered to be of value, quite hard to imitate, rare to find and that cannot easily be substituted (Barney & Chi, 1991). A valuable resource is that which can influence an entity in coming up with strategies that takes advantage of opportunities to be able to beat stiff competition. The theory underscores the benefits that an entity enjoys through the resources that are available and enable it to be operational. These resources can be the financial ability, location, human resource, technology along capabilities such as engaging in practices that are sustainable.

The capabilities along with resources give a company a competitive edge from their competition. A company needs to have materials which are unique in their characteristics along with procedures in work that are detailed that enable them to take out competitors in their firms' capabilities and resources and better serve their clients (Prahalad & Hamel, 1999). The county government can take advantage of sustainable procurement practices and use them as a unique resource to enable them meet the end goal of achieving supply chain agility. A well-managed and sustainable procurement that takes advantage and incorporates unique and rare resources to its operations is able to achieve a responsive supply chain and help the entity in performing better while gaining competitive edge (Lambert & Cooper, 2000).

2.2.3 Dynamic Capability Theory

The dynamic capability (DC) theory, since its introduction by Teece et al. (1997), has got significant attention. The theory has an objective of giving an explanation of how organizations can realize competitive edge in the contemporary dynamic market (Teece et al., 1997; Eisenhardt & Martin, 2000). Ahmed and Wang (2007) views Dynamic capability as the aptitude of the firm to undertake integration, recreate and renew their resources along with their capabilities to respond to the business environment that is always changing. By aligning the capabilities, resources and

abilities of the firm to the changes in environment, an organization is better placed to gain competitive edge over other participants in the same industry of operation (Teece, 2014). Therefore, by altering and reconfiguring their resources, firms are able to gain competitive advantage. Capabilities according to Teece et. al. (1997) is the means that an entity attempts to acquire and accumulate various skills and competences that are completely new and untried. The new capabilities acquired help in ensuring that various resources in the firm are effectively coordinated and deployed for the firm to enhance competitiveness.

The theory is applicable to the paper because it tries to explain how firms can use their dynamic capabilities to have a Responsive SC and gain competitive edge in response to the shifty environment that the county governments operate in. The firms can make sustainable procurement practices to be their dynamic capabilities and explore it in such a way that they achieve agile supply chains.

2.3 Sustainable Procurement Practices

Several definitions for SPP have been fronted over time, however, the globally recognized one emanated from the 2006 UK sustainable procurement task force. The taskforce defined SPP to be the procedure “where companies meet their requirement of works, goods, utilities and services in a manner which realizes money’s value on a total sum basis as it does not benefits the company only but the economy and the society as well, while minimizing environmental damage.” The paper thus adopted this definition. The significant difference between public procurement and SPP is the traditional public procurement looks only on the value for money at the purchasing point, however, SPP considers the economic, social and environmental frameworks in the purchasing function across the product life cycle as posited by the sustainable procurement Marrakech task force (2009). The SPP that the paper focused on included green purchasing, supplier partnership, ICT adoption, purchasing ethics and eco design and packaging.

2.3.1 Green Purchasing

Green purchasing is the acquisition of services and goods that are environment friendly as the services and products bear little consequence on the ecology and the health of people in comparison to competitor’s products which serve similar objectives. These products may consist of recyclable materials, reduction in waste, water and energy conservation, reduction in toxins consumed and disposed (Ochoa & Erdmenger, 2003). Companies are aware of the big number of

consumers who have different goods and services spectrum. All purchases bear an environment effect that emanates from the combined effect of the manufacture of the product, use, delivery and disposal. Green purchasing may generate value by increasing the overall efficiency, enhances reputation and company's market share and limits risk and liabilities to the environment. Organizations that practice green purchasing benefit economically by the reduction of wastes generated from suppliers, reduced expenses in handling and waste disposing risks (Holt & Kockelbergh, 2003). Organizations improve their public image through adoption of green procurement. Use of green suppliers may help a company grow its reputation among employees, investors and users (Khiewnavawongsa & Schmidt, 2008).

2.3.2 Supplier Partnering

This is the formation of strategic relationships between the suppliers and the company. It is made to leverage individual's capabilities in operation and strategy participating in companies that help in achievement of significant benefits. Partnership in supply puts emphasis on long-term and direct association and it provides for joint planning and efforts of solving issues as observed by Ragatz et al. (1997). These supply chain relations are utilized to generate common benefits for all parties' involved as well as continued participation in key strategic areas including products and markets. Partnering with suppliers allows businesses to operate proficiently with limited key vendors who are ready to split responsibilities to enable product success. The participating suppliers in early designing of products may offer choices for effective costing, help in selecting technologies and component, aid in assessing designs. Organizations that are strategically aligned may work together closely and does away with time wastage. Effective vendor partnership has a vital benefit that enhances an edge on the supply chain as observed by Griffith and Harvey (2001). The firm also need to source from local suppliers.

2.3.3 Adoption of Information Communication Technology

While companies look for ways to enhance agility in the supply chains by use of integration, ICT may be a significant enabler in the procurement process based on its ability to support the sharing of information and reducing the time for processing information (Mouritsen, *et al.*, 2003). Moreover, the ICT effect may be demonstrated in forms of their change in relationship, changes in the organizations and performance change (Wilson & Vlosky, 1998). The several frameworks that the process of procurement may be expressed and the wide factor variations where the effect

of ICT can be defined based on integration, indicate the initial research was limited to the study of limited dimensions and variables in relationships. Activity control and coordination between organizations in the chain of supply and how ICT impact the integration control level across the supply chain is essential (Mouritsen *et al.*, 2003).

ICT use in procurement aids in coordination of processes in business within and between the company and its suppliers. For instance, the use of systems of electronic purchasing, use of online catalogues and linking suppliers through the internet to facilitate the exchange of information on activities for fulfilment (Johnson & Leenders, 2004). Improvement in production levels, increase in response time and the overall increased performance and reduced risks have attracted managers (Flynn, 2003). Information system technological development and enhancement of information technology bear the ability to facilitate coordination between firms engaging in transportation as a result, allowing for virtual integration of the process of procurement. The management in organizations have come to the realization that technologies of information telecommunication enhance decisions in procurement through provision of real time information and enable collaboration between partners in trade (Power & Simon 2004). Technology provides an enabling environment which enables operations in an organization to be able to procure consistently the best value products and services by use of unified sourcing tools that are internet based and streamline complex negotiations support (Williams, 2005).

2.3.4 Ethical Purchasing

It is essential for the public procurement function to be undertaken with transparency, probity and in a manner that is accountable and ensures the public's value for money (Telgen, 2007). Probity ensures the process of procurement is undertaken in an ethical, fair and honest manner across all the participants. Accountability and transparency provide a basis for decisions to be made in clear and objective manner and the individual undertaking the purchase is accountable for procurement process conduct. The authorities that are contracting are to be cost effective and efficiently make use of resources and mainlining highest integrity standard. Contract management authorities are to ensure existence of significant appropriate focus on purchasing best practices and where there exists a significant function of procurement the procedures are put up to ensure compliance with guidelines set up (Saeed *et al.*, 2005)

Badenhorst (1994) was of the opinion that departments of purchasing are not wholly engaged in organizations strategic making of decisions as a result, people who are competent are to be appointed to be in charge of the department. Badenhorst (1994) is of the idea that the culture of a company affects the procurement ethical standards. Poor keeping of records and inadequate measures of control make purchasing discipline unethical behavior like fraud to take root (Saeed et al., 2005). The system of procurement is affected by both the technology and organization cultures according to Thai (2001). In an environment where gifts are a common practice, it is not easy to differentiate between a bribe and a gift (Thai, 2001). The OECD (2007) states that an organizations culture relies on process-based features result to unethical standards and recommends methods that are knowledge based. The environment in public procurement may develop an atmosphere that is conducive for unethical behavior (Badenhorst, 1994). According to Reilly and Kyi (1992), the staff in procurement behavior is significantly reliant on the company's support of intellectual property, top manager's support, limited resources in production and organizational climate.

2.3.5 Eco Design and Packaging

Practices of sustainable procurement are implemented by use of a variety of approaches based on the concept of product life cycle. The cycle begins at product design. Data on green designs put emphasis on environment conscious designs and analysis of product life cycle according to Srivastara, (2007). Under product design, the design team may alter raw materials or materials that are friendly to the environment and less toxic. Several terminologies relate to the design of green products for instance, Eco designing.

Public procurement is supposed to make sure that they purchase products that use biodegradable materials and can be reused and recycled to save the resources that exist. Customers and the suppliers are to share responsibilities in reprocessing, reusing and conserving the materials using in packaging. The firm's needs to be more concerned with issues of the environment as a result make considerations to procure materials that are friendly to the environment regardless of their high prices (Phanidou, 2012). Suki (2013) observes that consumers prefer precision of green products package and its benefits of being re used and recycled. Eco design and packaging are essential as it influences almost all the logistical activities as observed by Klevas (2005).

2.4. Sustainable procurement practices and supply chain agility

Several research have been completed in the global and local front on sustainable procurement. Globally, Filho et al. (2019) focused on procurement practices and sustainability in higher institutions of learning. Zaidi, Mirza, Hou and Ashraf (2019) focused on sustainable development through sustainable procurement and established that Sustainable procurement enhances sustainable development goals and delivery of service of Pakistani university. Focus was on the effect of sustainable procurement on sustainable development and not supply chain agility. Mukherjee (2019) studied on the analysis of sustainable procurement in SMEs in upcoming countries. It was established that sustainable procurement influenced the cost, flexibility and dependability of SMEs in developing countries. Vluggen, Gelderman, Semeijn and Van Pelt (2019) did a research on accountability and external forces in sustainable public procurement. Sustainable procurement was found to enhance accountability and influence service delivery. The study was on drivers of sustainable procurement and not sustainable procurement practices.

Locally, Wanja and Achuora (2020) majored on performance of procurement and sustainable procurement practices in Kenyan food and beverages manufacturing sector. It was established that sustainable procurement influenced performance with green purchasing having a large influence. Reverse logistics, green description, ecological procurement and green stock management were found to have a larger impact on procurement performance and specifically Flexibility, service delivery and Timeliness. The study compared sustainable procurement and performance leaving a gap for supply chain agility. Oduor (2019) on performance and sustainable SCM of supermarkets in Nairobi noted that engaging stakeholders, ecological sourcing, ecological production and backward logistics were embraced to a medium and large extent by supermarkets in Nairobi. The outcome also reveal that by using sustainable SCM practices, medium and large supermarkets in Nairobi were able to increase their speed, create higher-quality products, and save on cost. There is a contextual gap as this was carried out in supermarkets.

Chogo and Kitheka (2019) on the firm's performance and sustainable procurement noted that sourcing locally, eco-packaging, backward logistics and implementation of ICT had a positive substantial impact on timeliness and flexibility. Focus was on organizational performance and not supply chain agility. Aila and Ototo (2018) investigated the idea of sustainable procurement: Does

it all add up? Results portray that firms have adopted sustainability in Sourcing procedures, but the equilibrium act has yet to be found. SP also play crucial roles in ensuring organizations obtain a competitive edge through minimizing environmental impact, cost minimization, delivery of service and quality of services and products. The study did not narrow down specifically its context thus leaving a contextual gap for the current study.

Table 2. 1 Summary of Studies on Sustainable Procurement

Author(s)	Focus of the Study	Methodology	Study Findings	Research Gap
Filho et al. (2019)	Procurement Practices and Sustainability on higher learning institutions	Systematic Literature Review	Sustainable procurement limits ecological and social impact	Focused on influence of sustainable procurement on sustainable performance while not S.C agility
Zaidi et al. (2019)	Sustainable Development through Sustainable Procurement	Interpretive Structural Modelling	Legislation and 3 rd party pressure influences sustainable adoption.	Focused on influence on sustainable development while not supply chain agility
Mukherjee (2019)	Analysis of Sustainable Procurement in SMEs	Descriptive Research Design	sustainable procurement influenced the performance	The study only focused on SMEs and organizational performance creating a gap in county governments
Vluggen et al. (2019)	SPP External Forces & Accountability	Systematic Literature Review	Government regulations and community pressure influenced S. P	Focus was on drivers of sustainable procurement and not sustainable procurement practices
Wanja and Achuora (2020)	Sustainable Procurement & procurement performance	Descriptive cross-sectional survey	Sustainable Proc influenced procurement performance	Focused was on food and beverages manufacturing firms and not counties
Chogo and Kitheka (2019)	Sustainable procurement and organizational performance	Systematic Literature review	Eco-packaging, RL, local sourcing & ICT influenced performance	Used systematic literature review and not descriptive research design
Aila and Ototo (2018)	Sustainable procurement concept	Systematic Literature review	Enhances cost reduction, service delivery and gives competitive edge	Used systematic literature review and not descriptive research design

Source: *Research Data (2021)*

2.5 Proposed Conceptual Framework

Conceptual framework refers to the presentation that is schematic and shows variables which when they are put along each other, show the correlation between them (Peters et al., 2000). It is based on a set of wide concepts that are used in explaining the perceived existent correlation between the variables under study (Coulthard, 2004). The study relied on the framework where sustainable procurement practices was the independent variables while the dependent variable was supply chain agility. The variables were further operationalized in that the concepts of study under sustainable procurement practices were purchasing of green products, partnering between suppliers, use of ICT, undertaking ethical procurement and eco design and packaging as adopted from UK sustainable procurement task force (2006). Variables under supply chain agility were supply chain efficiency (Cost Efficiency and Resource Utilization) and Supply Chain Responsiveness (Timeliness and Flexibility).

Figure 2. 1 Proposed Conceptual Framework

Independent Variable

Sustainable Procurement Practices

- Green purchasing
- Supplier partnership
- ICT adoption
- Ethical purchasing
- Eco design and packaging

Dependent Variable

Supply Chain Agility

- Supply Chain efficiency**
 - Cost Efficiency
 - Resource Utilization
- Supply chain responsiveness
 - Timeliness
 - Flexibility

Source; *Researcher (2021)*

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This part focused on the employed design, the population that the study targeted, the tools for acquiring information and how it was analyzed.

3.2. Research Design

Descriptive research was the design adopted by the research. Cooper and Schindler (2006) notes that the design helps the researcher in answering questions like when, what, how and who. A descriptive research showcases the features of a specific situation as it possesses advantages of being flexible and accurate (Orodho and Kombo, 2009). The method helps confirm and provide a description of the features of the variables in question (Sekaran, 2006). According to Green (2014), a descriptive design expresses an accurate profile of events, people and a given situation. It confirms and elaborates the content of the variables being studied (Sekaran, 2006). Descriptive design was appropriate as it helped in answering the research questions and gave a flawless explanation of the events and objectives. Further, it helped in explaining the correlation between sustainable procurement practices and supply chain agility.

3.3 Target Population

Population is a group of people or components who share at minimum a single characteristic. It can also refer to a wider group of people from where a sample is derived (Orodho, 2003). All the Forty-Seven (47) County Governments in Kenya (CoG, 2020) formed the population of the study as illustrated in Appendix II. Given that the population was small and manageable and one representative of each county was tasked in filling the questionnaire, Census was adopted. Census was suitable due to the small population. The 47 County Governments therefore formed the sample size. The scope was relevant too since Public funds are devolved thus the need for prudent use.

3.4 Data Collection

The author made use of Primary data employed by questionnaires specially structured. Questionnaires that was shared through the target respondent's email addresses basically due to the outbreak of CORONA Virus 2019 pandemic and proximity challenges. Using the online

method, the researcher adhered to the Covid-19 health guidelines in view of containing the infectious and deadly disease. In areas where the researcher was in a position to reach, a drop-and-pick later technique was employed while at the same time observing the health protocols for instance social distancing, masking and sanitizing thus a safer and convenient mode of administering a questionnaire. The targeted respondents were the supply chain management officers in each of the 47 Counties. These were the professionals directly involved in public procurement and were in the best position to provide acute responses to the question under study. One questionnaire was administered in each county totaling to 47 Questionnaires which were categorized into 3 segments namely: A: Demographic information, B: Extent of adoption of sustainable procurement practices by the county governments of Kenya, Section C: The relationship between sustainable procurement practices and S.C agility at the county governments of Kenya.

3.5 Data Analysis

Collected information was analyzed by descriptive statistics and regression analysis. Questionnaires were scrutinized to make sure that the data is complete and accurate. Objective one was analyzed using descriptive statistics (Standard Deviation & Means) while objective two was analyzed using Regression Analysis to establish the correlation amongst sustainable procurement practices and supply chain agility. SPSS was used as the analysis tool. Regression model that was used is;

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + e$$

Where;

Y= supply chain agility

X₁ to X₅ is Sustainable Procurement practices

e= error term

β₀= constant

Table 3. 1 Summary of Data Collection and Data Analysis

Objectives	Data to be collected	Data collection tool	Analysis needed
General Information	PART A	Structured Questionnaire	Descriptive Statistics (percentages)
The extent of adopting sustainable procurement by the County Government of Kenya.	PART B	Structured Questionnaire	Descriptive Statistics (Mean and Standard Deviation)
The correlation between sustainable procurement practices and S.C agility	PART C	Questionnaire	Regression analysis

Source: *Research Data (2021)*

CHAPTER FOUR: DATA ANALYSIS, FINDINGS AND DISCUSSIONS

4.1 Introduction

The aim of the research was to establish the influence of sustainable procurement on supply chain agility of the county governments in Kenya. This chapter analyses the findings with regards to demographic information, extent of adoption as well as the correlation between sustainable procurement and supply chain agility.

4.2 Response rate

This study targeted 47 County Governments in Kenya of which 41 responded translating to 87.23% of the respondents, a percentage considered sufficient for analysis. Yin (2017) considers a response rate of over 70 % as adequate for interpretation, presentation and analysis of the outcome of any research

4.3 General Information

The research aimed at determining the job title of the study's participants, period of service and highest education level that they held and outcome are presented in table 4.1

Table 4.1 illustrates that 57% of the study's participants represented supply chain managers whereas 43% were supply chain/ Procurement officers. The outcome suggests that a big percentage of the participants held managerial positions and were knowledgeable on the subject matter under study

On the period of work under the positions that they held, most respondents (36.59%) had worked for between 5 and 10 years in their current positions while 26.83% had served for over 10 years and 21.95% had served for 3- 5years with the remaining 14.63% having worked for less than two years. Thus 85.37% of the supply chain managers and officers have worked for more than 3 years, an indication that they were knowledgeable and experienced in participating in the research.

On the level of education, a big percentage or the respondents which is 75.61% had attained college degrees, 17.07% had post graduate degrees with 7.32% having attained diploma. Hence, the majority (92.68%) ad attained undergraduate and post graduate degrees as their highest education

levels and thus were learned enough, an indication that the county governments employs learned and competent people to fill the positions.

Table 4. 1 General Information

Job Title	Frequency	Percentage (%)
Supply chain managers	21	51.21
Supply chain officers	20	48.79
Period of service(years)	Frequency	Percentage (%)
0-2	6	14.63
3 -5	9	21.95
5 -10	15	36.59
Over 10	11	26.83
Highest Education Level	Frequency	Percentage (%)
Diploma	3	7.32
Degree	31	75.61
Post Graduate	7	17.07
Total	41	100

Source; Research Data (2021)

4.4 Sustainable procurement practices adoption

The first objective was to examine the extent of adoption of sustainable procurement practices by the county governments in Kenya and the subsequent sections present the outcome.

4.4.1 Green Purchasing

The research aimed at establishing the level of adoption of green purchasing by the county governments in Kenya. Table 4.2 illustrates that the firm engages in electronic procurement (IFMIS) which has little effect on the environment and has adopted it to a large extent as shown by the mean of 4.12 and S.D of 0.89. Also to a large extent, mean = 4.07, S.D= 0.99, the firm has procurement policies and contract clauses that promote green purchasing and procurement. The entity procuring goods, works or services from suppliers who are committed to green initiative

policies was adopted to a medium extent (M=3.43, SD=1.56) while the entity purchasing products with little effect on the environment was adopted to a large extent as evidenced by the mean of 3.65 and standard deviation of 1.43

Table 4. 2 Green Purchasing

Green Purchasing	Mean	Std. Dev
Our e-procurement process has little effect on the environment i.e. IFMIS	4.1631	0.88639
The firm has procurement policies and contract clauses that promote green purchasing and procurement	4.0721	0.99850
The entity procures goods, works or services from suppliers who are committed to green initiative policies	3.4270	1.58563
The entity purchases products that have little effect on the environment	3.6459	1.42594
Overall score	3.8277	1.19583

Source: Research Data (2021)

4.4.2 Supplier Partnership

The researcher sought to find out the level of adoption of supplier partnership by the county governments in Kenya and table 4.3 indicates that the entity having strategic alliances with vendors and contractors was adopted to a medium extent with the mean of 3.44 and deviation of 1.64 while the county governments maintaining a a database of prequalified suppliers and contractors was adopted to a large extent (M=3.55, SD=1.48).the entity engaging consultants in the development and design processes (M=3.32, SD=1.68) and the entity considering advance funding of vendors and contractors in certain projects (M=3.35, SD=1.66).were adopted to a medium extent as per their individual deviations and means.

Table 4. 3 Supplier Partnership

Supplier Partnership	Mean	Std. dev
The entity has strategic alliances with vendors and contractors	3.4441	1.6440
The entity maintains a database of prequalified suppliers and contractors	3.5541	1.47873
The entity engages consultants in the development and design processes	3.3200	1.68012
The entity considers advance funding of vendors and contractors in certain projects	3.3538	1.65765
Overall score	3.4179	1.50427

Source: Research Data (2021)

4.4.3 Adoption of ICT

The study wanted to determine the level of ICT adoption by the county governments in Kenya. Table 4.4 shows that ICT playing a big part in the endeavor to enhance e-procurement i.e. IFMIS was adopted to a large extent (M=3.70, SD=1.25).with tenders being advertised online through the entities website to promote competition and enhance transparency also being adopted to a large extent as denoted by the mean of 3.62 and deviation of 1.56. Also to a large extent (M=3.59, SD=1.47; M=3.52, SD=1.53), the staff was trained on the e-procurement process i.e. IFMIS conversant and ICT department was staffed with qualified personnel as indicated by their specific mean and deviations

Table 4. 4 ICT Adoption

ICT Adoption	Mean	Std. Dev
ICT plays a big part in enhancing e-procurement i.e. IFMIS	3.7027	1.25145
Tenders are advertised online for instance through the entities website to promote competition and enhance transparency	3.6216	1.56312
The staff is well trained on the e-procurement process i.e. IFMIS conversant	3.5905	1.47531
The ICT department is staffed with qualified personnel	3.5205	1.5244
Overall score	3.6098	1.3714

Source: Research Data (2021)

4.4.4 Ethical Purchasing

The study aimed at finding out the adoption extent of Ethical Purchasing by the county governments in Kenya and table 4.5 shows that conducting market survey to ensure works, goods and Services are procured at estimated market value was adopted to a moderate extent with the mean of 3.43 and SD of 1.78 with some contracts being reserved for the local industry being adopted to a large extent (M=3.74, SD=1.33).The entity offering equal opportunity for everyone to participate in the procurement process was adopted to a medium extent (M=3.33, SD=1.61).with the county governments being committed to contractual obligations including timely payments for work done also being adopted to a moderate extent with the mean of 3.23 and deviation of 1.88.

Table 4. 5 Ethical Purchasing

Ethical Purchasing	Mean	Std. Dev
We conduct market survey to ensure works, goods and Services are procured at estimated market value	3.4273	1.7765
Some contracts are reserved for the Local Industry	3.7432	1.3286
The entity offers equal opportunity for everyone to participate in the procurement process	3.3322	1.61782
The entity is committed to contractual obligations including timely payments for work done	3.2351	1.87701
Overall score	3.4350	1.5878

Source: Research Data (2021)

4.4.5 Eco Design and Packaging

The researcher sought to ascertain the extent of adopting Eco Design and Packaging by the county governments in Kenya. The firm ensuring that the products are well labelled for proper use was adopted to a large extent (M=3.59, SD=1.47) with the firm recommending downsized packaging for ease of handling and storage being adopted to a medium extent (M=3.55, SD=1.48) as depicted in table 4.6. Encouraging suppliers to adopt methods of packaging that incorporates return and reuse and also help in promotion of returned packaging was adopted to a large extent (M=3.66,

SD=1.55) while liaising with key suppliers to have a standardized package (M=3.39, SD=1.66) was moderately adopted by the county governments in Kenya.

Table 4. 6 Eco Design and Packaging

Eco Design and Packaging	Mean	Std. Dev
The firm ensure that the products are well labelled for proper use	3.5873	1.4765
The firm recommend downsized packaging for ease of handling and storage	3.4432	1.6286
We encourage suppliers to adopt packaging methods that incorporates return and reuse to aid in promotion of returned packaging	3.6622	1.5582
We liaise with our suppliers to have a standardized package	3.3922	1.6646
Overall score	3.5210	1.4578

Source: Research Data (2021)

4.5 Sustainable Procurement and Supply Chain Agility

The research sought to determine the correlation between sustainable procurement and supply chain agility and the outcomes are subsequently presented.

4.5.1 Sustainable procurement and supply chain efficiency

The researcher aimed at establishing the correlation between sustainable procurement and supply chain efficiency at the county governments in Kenya and table 4.7 shows that the significance value (p) (X_1 ($t=3.825$, $P<0.05$), X_2 ($t=1.958$, $P<0.05$), X_3 ($t=2.446$, $P<0.05$), X_4 ($t=2.864$, $P<0.05$) and X_5 ($t=3.965$, $P<0.05$) of each sustainable procurement practices is lower than 5% an implication that sustainable procurement practices has a statistical relevant relationship with supply chain efficiency at the county governments in Kenya. This implies that the implementation of sustainable procurement practices (green purchasing, supplier partnership, ICT, ethical procurement and eco design and packaging) influences supply chain efficiency.

Table 4. 7 Regression Coefficient of supply chain efficiency

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	6.530	1.547		5.694	.013
	Green Purchasing	.437	.235	.652	3.825	.014
	Supplier Partnership	.846	.758	.345	1.958	.020
	ICT Adoption	.817	.244	.642	2.446	.021
	Ethical purchasing	.396	.834	.225	2.864	.033
	Eco design and packaging	.647	.895	.562	3.965	.014

a. Dependent Variable: supply chain efficiency

Source: Research Data (2021)

$$Y_1 = 6.53 + .437X_1 + .846X_2 + .817X_3 + .396X_4 + .647X_5 \dots\dots\dots(i)$$

Table 4. 8 Model Summary of supply chain efficiency

Model	R	R square	Adjusted square	R	Std. Error of the Estimate
I	.705 ^a	.698	.663		.56787

a. Predictors: (Constant), green purchasing, supplier partnership, ICT adoption, ethical procurement, eco design and packaging,

Source: Research data (2021)

As shown in table 4.8, the R² is 0.698 which can be translated to 70%. This means that 70% of supply chain efficiency is accredited to sustainable procurement (green purchasing, supplier partnership, ICT, ethical procurement and eco design and packaging) adoption.

Table 4.9 portray that F value is 13.123 with F critical being 5.231 affirming a statistical relevant model. This is corroborated by the value of P .013 being < 5%. Thus, sustainable procurement (green purchasing, supplier partnership, ICT, ethical procurement and eco design and packaging) is a suitable predictor of supply chain efficiency

Table 4. 9 ANOVA analysis of supply chain efficiency

Model		Sum of Squares	Df	Mean Square`	F	Sig.
1	Regression	8.703	4	5.231	13.123	.013 ^b
	Residual	3.574	36	.423		
	Total	12.277	40			

a. Dependent Variable: supply chain efficiency

b. Predictors: (Constant), green purchasing, supplier partnership, ICT adoption, ethical procurement, eco design and packaging,

Source: Research Data (2021)

4.5.2 Sustainable Procurement and Supply Chain Responsiveness

The study aimed at establishing the relationship between Sustainable Procurement and Supply Chain Responsiveness. As per table 4.10, the outcome shows that the P values (X_1 (t=3.427, $P<0.05$), X_2 (t=2.189, $P<0.05$), X_3 (t=2.153, $P<0.05$), X_4 (t=2.934, $P<0.05$) and X_5 (t=3.856, $P<0.05$) for green purchasing, supplier partnership, adoption of ICT, ethical purchasing and ecological design and packaging are less than 5% ($0.001 < 0.05$) inferring that sustainable procurement practices has a statistically noteworthy correlation with supply chain responsiveness at the county governments in Kenya. This means that the adoption of sustainable procurement (green purchasing, supplier partnership, ICT, ethical procurement and eco design and packaging) influences supply chain responsiveness.

$$Y_2 = 15.12 + .657X_1 + .761X_2 + .851X_3 + .275X_4 + .936X_5 \dots\dots\dots(ii)$$

Table 4. 10 Regression Coefficient of supply chain responsiveness

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	15.120	1.435		5.891	.022
	Green Purchasing	.657	.745	.276	3.427	.043
	Supplier Partnership	.761	.810	.166	2.189	.032
	ICT Adoption	.851	.409	.453	2.153	.041
	Ethical purchasing	.275	.276	.761	2.934	.014
	Eco design and packaging	.936	.199	.296	3.856	.001

a. Dependent Variable: supply chain Responsiveness

Source: Research Data (2021)

Table 4. 11 Model Summary of supply chain responsiveness

Model	R	R square	Adjusted square	Std. Error of the Estimate
I	.758 ^a	.685	.668	.91841

a. Predictors: (Constant), green purchasing, supplier partnership, ICT adoption, ethical procurement, eco design and packaging,

Source: Research data (2021)

As shown in table 4.11, the R^2 is 0.685 which can be translated to 69%. This means that 69% of supply chain responsiveness is accredited to sustainable procurement (green purchasing, supplier partnership, ICT, ethical procurement and eco design and packaging) adoption.

Table 4. 12 ANOVA Analysis of supply chain responsiveness

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	12.329	4	5.762	12.349	.032 ^b
	Residual	5.905	36	.087		
	Total	18.324	40			

a. Dependent Variable: Supply Chain Responsiveness

b. Predictors: (Constant), green purchasing, supplier partnership, ICT adoption, ethical procurement, eco design and packaging,

Source: Research Data (2021)

Table 4.12 portray that F value is 12.493 with F critical being 5.762 affirming a statistical relevant model. This is corroborated by the value of P .032 being < 5%. Thus, sustainable procurement (green purchasing, supplier partnership, ICT, ethical procurement and eco design and packaging) is a suitable predictor of supply chain responsiveness.

4.5.3 Sustainable Procurement and Supply Chain Agility

The study sought to determine the relationship between Sustainable procurement and supply chain agility and the results are shown in the subsequent tables.

Table 4. 13 Model Summary of supply chain agility

Model	R	R square	Adjusted square	R	Std. Error of the Estimate
I	.682 ^a	.739	.690		.65138

a. Predictors : (Constant), green purchasing, supplier partnership, ICT adoption, ethical procurement, eco design and packaging,

Source: Research data (2021)

As shown in table 4.13, the R² is 0.739 which can be translated to 74%. This means that 74% of supply chain agility is accredited to sustainable procurement practices (green purchasing, supplier partnership, ICT, ethical procurement and eco design and packaging) adoption by the county governments in Kenya.

Table 4. 14 ANOVA Analysis of supply chain agility

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	5.271	4	1.276	11.781	.004 ^b
	Residual	3.678	36	.234		
	Total	8.949	40			

a. Dependent Variable: Supply Chain Agility

b. Predictors: (Constant), green purchasing, supplier partnership, ICT adoption, ethical procurement, eco design and packaging,

Source: Research Data (2021)

Table 4.14 portray that F value is 11.781 with F critical being 1.276 affirming a statistical relevant model. This is corroborated by the value of P .004 being < 5%. Thus, sustainable procurement

(green purchasing, supplier partnership, ICT, ethical procurement and eco design and packaging) is a suitable predictor of supply chain agility of the county governments in Kenya.

Table 4. 15 Regression Coefficient of supply chain agility

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	10.541	2.431		8.543	.013
	Green Purchasing	1.970	.214	.789	2.436	.015
	Supplier Partnership	.509	.549	.162	2.127	.001
	ICT Adoption	.511	.904	.451	3.639	.031
	Ethical purchasing	.912	.259	.867	4.512	.043
	Eco design and packaging	.789	.156	.156	3.912	.034

a. Dependent Variable: supply chain agility

Source: Research Data (2021)

From the foregoing discussion, the regression model is presented as follows:

$$Y_3 = 10.541 + 1.970X_1 + .509X_2 + .511X_3 + .912X_4 + .789X_5 \dots\dots\dots(iii)$$

From table 4.13 above, green purchasing (t=2.436, P<0.05), supplier partnership (t=2.127, P<0.05), ICT adoption (t=3.639, P<0.05), ethical purchasing (t=4.512, P<0.05) and eco packaging and design (t=4.912, P<0.05) each contain an affirmative and significant relationship with supply chain agility as indicated by the P values of lower than 5%. This therefore means that green purchasing, supplier partnership, ICT adoption, ethical purchasing, and eco packaging and design all influence supply chain agility (efficiency & responsiveness) at the county governments in Kenya.

4.6 Discussions of research findings

The study was guided by two objectives namely; to determine the extent of adoption of sustainable procurement by the county governments and to establish the relationship between sustainable procurement and supply chain agility by the county governments of Kenya. Both the objectives were achieved by the study. On the first objective, it was determined that Green packaging, ICT

adoption and eco design and packaging were adopted to a large extent while supplier partnership and ethical purchasing were adopted to a moderate extent.

Green purchasing was adopted to a large extent (Mean- 3.83, Deviation- 1.19) by the county governments in Kenya. The outcome aligns with that of Oduor (2019) who found that Green Purchasing, is vital to a firm as it enhances speed, maintains quality and saves on cost, Chogo and Kitheka (2019) add that green purchasing may generate value by increasing the overall efficiency, enhances reputation and company's market share and limits risk and liabilities to the environment. Organizations that practice green purchasing benefit economically by the reduction of wastes generated from suppliers, reduced expenses in handling and waste disposing risks (Holt & Kockelbergh, 2003). Organizations improve their public image through adoption of green procurement. Use of green suppliers may help a company grow its reputation among employees, investors and users (Khiewnavawongsa & Schmidt, 2008).

Generally, Supplier partnership was moderately adopted (M=3.42, SD=1.50).by the county governments in Kenya. The findings disagrees with that of Chen (2019) who notes that to gain competitive edge in the shifting business field, entities should partner with vendors and clients for improved agility. Ragatz et al. (1997) add that partnering with suppliers allows businesses to operate proficiently with limited key vendors who are ready to split responsibilities to enable product success. Effective vendor partnership has a vital benefit that enhances an edge on the supply chain as observed by Griffith and Harvey (2001).

The overall score implies that ICT was adopted to a large extent by the county governments in Kenya with the mean of 3.61 and deviation of 1.37. The findings concurs with those of Mouritsen, *et al.*, (2003) who opine that ICT may be a significant enabler in the procurement process based on its ability to support the sharing of information and reducing the time for processing information. The management in organizations have come to the realization that technologies of information telecommunication enhance decisions in procurement through provision of real time information and enable collaboration between partners in trade (Power & Simon 2004). Technology provides an enabling environment which enables operations in an organization to be able to procure consistently the best value products and services by use of unified sourcing tools that are internet based and streamline complex negotiations support (Williams, 2005).

The county governments in Kenya have adopted ethical purchasing to a medium extent as seen on the overall score which showcases a mean of 3.44 and standard deviation of 1.59. The result contradicts that of Chen (2019) who ascertained that ethical purchasing aids a firm in being cost effective and efficiently make use of resources and maintaining highest integrity standard. Saeed *et al.* (2005) adds that ethical purchasing is crucial to firms as it promotes best practices and helps a firm obtain best value for its purchases as well as enhancing transparency and accountability in procurement process. .

The county governments in Kenya have adopted Eco-design and packaging to a large extent as pointed out by the overall score with the mean of 3.52 and deviation of 1.46. The outcome are in agreement with that of Muller *et al.* (2009) who noted that design of materials to be procured and procurement of materials should be in a way that it's sustainable and can help achieve supply chain agility of an organization. Chogo and Kitheka (2019) noted that eco-packaging, had a positive substantial impact on organizational performance. Public procurement is supposed to make sure that they purchase products that use biodegradable materials and can be reused and recycled to save the resources that exist. Suki (2013) observes that consumers prefer precision of green products package and its benefits of being re used and recycled. Eco design and packaging are essential as it influences almost all the logistical activities as observed by Klevas (2005).

The second objective established that Green packaging, ICT adoption, eco design and packaging supplier partnership and ethical purchasing all influences supply chain agility through efficiency and responsiveness. In general, it is thus concluded that sustainable procurement has an affirmative and significant relationship with supply chain efficiency. The finding is supported with that of Chen (2019) who asserted that to gain competitive edge in the shifting business ground, entities need to have a sustainable procurement so that they can have efficient supply chains. Mukherjee (2019) notes that sustainable procurement in SMEs influenced supply chain efficiency through cost minimization and supply chain responsiveness through flexibility. Wanja and Achuora (2020) opine that sustainable procurement influences supply chain responsiveness through flexibility and timely delivery of product and service delivery Sustainability has a crucial part in ensuring that the integrity of any given brand is maintained while being able to manage the agility of supply chain of an entity to ensure that there is continuity as observed by Muller *et al.* (2009). Agility aids the firm in obtaining the ability to quickly-foresee and timely-react to market changes (Gligor, Bozkurt, Gölgeci & Maloni, 2020). Sustainable Procurement has gained massive interest from the

public as well as the Private sector as it has been established to influence a firm's performance, gives it a competitive edge over the competitors as well as enhancing agility (Raj, Agrahari & Srivastava, 2020).

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The summary, conclusions, recommendations as well as suggestions for future studies, all of which have been derived from the study's objectives, are subsequently discussed.

5.2 Summary of Findings

This section summarizes the findings as per the questions and objectives posed by the researcher. The extent of adoption of sustainable procurement by the county governments in Kenya was operationalized by green purchasing, supplier partnership, ICT adoption, ethical purchasing and ecological design and packaging. Green packaging, ICT adoption and eco design and packaging were adopted to a large extent while supplier partnership and ethical purchasing were adopted to a moderate extent. This implies that the county governments in Kenya put more efforts on green packaging, ICT adoption and eco design and packaging as they were largely adopted due to their perceived benefits and influence on supply chain agility. The county governments however, did not put much emphasis on supplier partnership and ethical purchasing as they were moderately adopted implying that their benefits are somehow overlooked and thus little efforts has been put on investing on the practices.

On the correlation between sustainable procurement and supply chain agility, regression analysis was executed and based on the regression coefficient, green purchasing, supplier partnership, ICT adoption, ethical purchasing and eco packaging and design all had a positive and significant relationship with supply chain efficiency, supply chain responsiveness and supply chain agility in general. This therefore means that green purchasing, supplier partnership, ICT adoption, ethical purchasing, and eco packaging and design all influence supply chain agility at the county governments in Kenya

5.3 Conclusion

The purpose of the research was to assess the relationship between sustainable procurement and supply chain agility of the county governments in Kenya. The outcome of the study in the previous chapter has led to the conclusion of an existent substantial correlation between sustainable procurement and supply chain agility of the county governments in Kenya. Sustainable

procurement was found to influence supply chain efficiency through cost efficiency and resource utilization while supply chain responsiveness was influenced through flexibility and timeliness.

The study achieved its first objective as different sustainable procurement practices were adopted on different extent. Green purchasing, ICT adoption and eco design and packaging were adopted to a large extent. Supplier partnerships and ethical procurement were adopted to a moderate extent by the county governments in Kenya. This indicated that sustainable procurement had been adopted by the county governments in Kenya, albeit to different extents.

The second objective was also achieved and the study concludes that sustainable procurement influences supply chain agility at the county governments in Kenya. More specifically, it is concluded that green purchasing, supplier partnership, adoption of ICT, ethical procurement and eco design and packaging influences supply chain efficiency, supply chain responsiveness and supply chain agility in general.

5.4 Recommendations from the study

Based on the outcome of the research, the author recommends that the county governments in Kenya should embrace sustainable procurement if they are to enhance supply chain efficiency and responsiveness. The county governments need to adopt supplier partnership to a large extent as literature established that, to enhance responsiveness in the shifting market conditions, entities should partner with vendors and clients for improved agility. Partnering with suppliers also allow businesses to operate proficiently with limited key vendors who are ready to split responsibilities to enable product success. Effective vendor partnership has a vital benefit that enhances an edge on the supply chain and thus it is crucial for firms to largely partner with her suppliers.

Further, it is recommended that the county governments must adopt ethical purchasing to a large extent as it was moderately adopted. This is because ethical purchasing leads to cost effectiveness and efficient resource utilization and mainlining highest integrity standard. Ethical purchasing is crucial to firms as it promotes best practices and helps a firm obtain best value for its purchases as well as enhancing transparency and accountability in procurement process. Thus the study recommends that the county governments need to adopt ethical purchasing to a large extent if they are to enjoy these benefits.

It is recommended that the county governments fully and largely adopt all the sustainable procurement practices as they have been established to influence supply chain agility. The fluctuations in the extent of adoption has made it difficult to fully achieve supply chain agility as only 74% of supply chain agility is attributed to sustainable procurement. Thus, full adoption of the practices might enhance supply chain agility.

5.5 Suggestions for further studies

Upcoming studies should focus on the drivers of sustainable procurement in the county governments in Kenya. This way, it can be noted what truly makes the county government adopt sustainable procurement practices. The milestones faced in the implementation of sustainable procurement can also be another area of focus for the future study. This will be able to un-earth the indicators that hinder full adoption of sustainable procurement by the county governments in Kenya.

Future study can maintain the constructs of the study but change the context in which the study was carried out. A study can be carried out to compare sustainable procurement and supply chain agility of either manufacturing firms, Banking sector, Agrochemicals, Pharmaceuticals or even Multinational corporations. This will help in knowing whether the studies will yield the same results.

Apart from changing the context, future study can change one of the concept like the dependent variable. This can be done by attempting to carry out the influence of sustainable procurement of supply chain performance, competitive advantage, financial performance or even service delivery on different sectors,

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APPENDIX 1: INTRODUCTION LETTER



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14 October 2021

TO WHOM IT MAY CONCERN

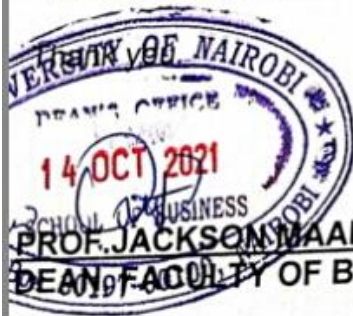
Dear Sir/Madam,

INTRODUCTION LETTER FOR RESEARCH
FREDRICK ODUOR OPONDI REGISTRATION NO. D67/7000/2017

This is to confirm that the above named is a bona fide student in the *Master of Science in Supply Chain Management (MSc. SCM)* degree program in this University. He is conducting research on "*Sustainable Procurement and Agility of the County Governments in Kenya.*"

The purpose of this letter is to kindly request you to assist and facilitate the student with necessary data which forms an integral part of the Project. The information and data required is needed for academic purposes only and will be treated in **Strict-Confidence**.

Your assistance will be highly appreciated.



PROF. JACKSON MAALU
DEAN OF FACULTY OF BUSINESS AND MANAGEMENT SCIENCES

APPENDIX II: QUESTIONNAIRE

Introduction

This questionnaire was created with the express intent of gathering information on **SUSTAINABLE PROCUREMENT ON SUPPLY CHAIN AGILITY IN KENYA'S COUNTY GOVERNMENTS**. Please complete the required information by providing in the blanks where space is given or by selecting the most appropriate answer by ticking against it.

SECTION A: Biographic information

1. Please tick your job title.

- a. Head of Supply Chain Management []
- b. Supply Chain Management Officer []

2. How long have you worked for your organization?

- a. 0 – 2 years []
- b. 3 – 5 years []
- c. 5 -10 years []
- d. Over 10 years []

3. What is the highest level of your education?

- a. Certificate []
- b. Diploma []
- c. Degree []
- d. Post Graduate []

SECTION B: EXTENT OF ADOPTION OF SUSTAINABLE PROCUREMENT PRACTICES

4. Some of the practices used by organizations who are devoted to Sustainable procurement practices are listed below. Please describe how far the following Sustainable Procurement Practices have been implemented in your company. Please rank the following items from 1 to 5; (where: 1- to a very small extent, 2- to a small extent, 3- to medium extent, 4- to a large extent and 5- to very large extent). Tick the boxes that apply.

GREEN PURCHASING	1	2	3	4	5
The entity purchases products that have little effect on the environment					
The entity procures goods, works or services from suppliers who are committed to green initiative policies					
Our e-procurement process has little effect on the environment i.e. IFMIS					
We have procurement policies and contract clauses that promote green purchasing and procurement					
The entity procures from ISO-14000 Certified vendors and contractors					
SUPPLIER PARTNERSHIP	1	2	3	4	5
The entity has strategic alliances with vendors and contractors					
The entity considers advance funding of vendors and contractors in certain projects					
The entity engages consultants in the development and design processes					
The entity maintains a database of prequalified suppliers and contractors					
The entity carries out trainings and seminars to educate our suppliers on the need of green and encourage them in supplying green products					
ICT ADOPTION	1	2	3	4	5
The entity has invested heavily on ICT					
The ICT department is staffed with qualified personnel					
ICT plays a big part in the endeavor to enhance e-procurement i.e. IFMIS					
Tenders are advertised online for instance through the entities website to promote competition and enhance transparency					
We are well trained on the e-procurement process i.e. IFMIS conversant					
ETHICAL PURCHASING	1	2	3	4	5
The entity offers equal opportunity for everyone to participate in the procurement process					
The entity is committed to contractual obligations including timely payments for work done					
We conduct our procurement process in an honest and fair manner to the public					
We conduct market survey to ensure Works, goods and Services are procured at estimated market value					
Some contracts are reserved for the Local Industry					
ECO DESIGN AND PACKAGING	1	2	3	4	5
There are conditions enshrined in the tender documents which require that products are packaged in material with minimal effect on the environment (Biodegradable materials) and works to have controlled environmental effects					
We ensure that the products are well labelled for proper use					
We liaise with our suppliers to have a standardized package					

We encourage suppliers to adopt methods of packaging that incorporates return and reuse and also help in promotion of returned packaging					
We recommend downsized packaging for ease of handling and storage					

Others (please specify)

.....

SECTION C: SUPPLY CHAIN AGILITY

6. Sustainable Procurement Practices has been established to influence supply chain agility of organizations that have implemented it. Kindly show the extent that your firm has experienced the subsequent agility results as a result of using sustainable procurement practices. (1- strongly disagree, 2- disagree, 3- not sure, 4- agree, 5- strongly agree). Tick the boxes that apply.

SUPPLY CHAIN EFFICIENCY	1	2	3	4	5
Cost Efficiency					
Resource Utilization					
SUPPLY CHAIN RESPONSIVENESS	1	2	3	4	5
Flexibility					
Timeliness					

Others (kindly mention)

.....

Thanks for your assistance

APPENDIX III: LIST OF COUNTY GOVERNMENTS IN KENYA

Source: *Council of Governors (2021)*

[Http.www.cog.go.ke](http://www.cog.go.ke)