GREEN SUPPLY CHAIN MANAGEMENT PRACTICES AMONG PUBLIC UNIVERSITIES IN KENYA

BY:

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DECLARATION

I declare the contents of this project to be my original work and that the work has never be submitted to any university for examination.

Signature…  Date……20.11.2023

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D67/38868/2020

This research project has been submitted with my approval as the University Supervisor.

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DEDICATION

This study project is dedicated to my dear mother, Catherine Kioko and my siblings Nelson, Winifred, Buttros, Tingey and Eric.

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ABBREVIATIONS AND ACRONYMS

3PL	Third Party Logistics
4PL	Fourth Party Logistics
CUE	Commission for University Education
GD	Green Distribution
GDP	Gross Domestic Product
GoK	Government of Kenya
GP	Green Procurement
GSCM	Green Supply Chain Management Practices
KENET	Kenya Education Network
RBV	Resource Based View
RL	Reverse Logistics
SC	Supply Chain
SD	Standard Deviation
UNEP	United Nations Environmental Program

ABSTRACT

In the wake of globalization, stiff competition, the need to cut down costs and increased pressure from governments, civil societies, consumer groups and other interest groups to adopt sustainable development, organizations are now responding to these concerns by adopting measures that ensure their interactions with the society and the environment are sustainable. Green Supply Chain Management (GSCM) has emerged as a corporate strategy with the potential to fuel economic, social and environmental long-term shared value in business environments faced with challenges such as environmental degradation and stiff competition. The purpose of the study was investigate GSCM practices adopted by public universities in Kenya and the researcher was guided by three objectives throughout the study. The first objective that the researcher sought to address was ascertaining the level of GSCM adoption among these institutions of higher learning. On the second objective, the researcher sought to understand the factors that drove these institutions to adopt GSCM practices and thirdly, the study aimed to reveal the various barriers that hinder the universities from successfully adopting GSCM practices. A descriptive research design was the approach used in the study where a census was conducted on all the 35 public universities in Kenya. Questionnaires were used to gather primary data and were administered online using Google forms and electronic mails as well as phone calls were used to deliver and follow up with respondents. The data collected for all the three objectives was analyzed by way of descriptive statistics where means and standard deviations were used to measure variables. For objective (i) it was found that green procurement was adopted to a moderately large extent among public universities followed by reverse logistics adopted to a moderately large extent and thirdly ranked was green logistics adopted to a moderate extent. On objective (ii) the study found that social and environmental responsibility are the leading drivers of GSCM practices adoption among public universities in Kenya, followed by government regulations, economic benefits, competition and least driver was customer pressure. For objective (iii), high initial cost of adoption was the leading barrier of GSCM practices adoption, followed by lack of relevant knowledge and experience, inadequate technology was ranked third, lack failure of the government to support GSCM initiatives and least barrier was failure of top management to embrace and support GSCM adoption. From the findings, it is recommended that public universities should fully adopt GSCM practices to realize the full benefits of GSCM. Research in future should focus on the private university sector, and that GSCM practices not considered here to be included in future research.

CHAPTER ONE: INTRODUCTION

1.1 Background of Study

In the wake of globalization, stiff competition, the need to cut down costs and increased pressure from governments, civil societies, consumer groups and other interest groups to adopt sustainable development, organizations are now responding to these concerns by adopting measures that ensure their interactions with the society and the environment are sustainable (Rivera, 2004). Green Supply Chain Management (GSCM) is being recognized as a corporate strategy with the potential to fuel economic, social and environmental long-term shared value in business environments faced with challenges such as environmental degradation and stiff competition (Machogu, 2013). As the awareness towards issues surrounding environmental sustainability grow over time, the demand for extant literature on Supply Chain (SC) management practices that minimize the ecological effects of a firm's activities and generate environmental performance change also increase (AlKhidir & Zailani, 2009).

The theoretical lens of this study stemmed from the Resource-Based-Theory (RBV), the Institutional Theory (IT) and the Stakeholder Theory (ST). According to the proponents of the RBV, organizations should utilize available resources to develop firm-specific strategies that give the organization a competitive edge to thrive the external environment (Elkington, 1997). The institutional theory proposes that institutions gain their legitimacy through their interactions with the environment. It explains how external factors like government and society influence strategy formulation and adoption within an organization. This theory aided the researcher in explaining the economic, political and social interactions of public universities in Kenya that influence the extent of GSCM

practices adoption. The Stakeholder Theory also provided the theoretical foundation for the drivers of GSCM adoption as influenced by different stakeholders.

In Kenya, there are 35 public universities whose sourcing, distribution, production and waste management operations contribute to environmental degradation (KENET, 2023). These universities are also faced with a pressing need to manage their costs due to inadequate funding from the government (CUE, 2020). Owing to these factors, there is need for public universities to become more environmentally and financially sustainable forcing public universities in Kenya to rethink their sustainability strategies (Nasiche & Ngugi, 2014). Although GSCM has the potential to help these universities cut down costs and manage their environmental impact, not all public universities in Kenya have successfully implemented GSCM practices owing to challenges such as lack of management support, inadequate knowledge on how to successfully implement GSCM strategy, lack of a good strategy communication plan, and high initial cost of adaption (Nasiche & Ngugi, 2014). This realization intrigued the researcher to carry out an investigation into the adoption of GSCM practices among public universities in Kenya.

1.1.1 Green Supply Chain Management (GSCM) Practices

The concept of GSCM is increasingly gaining popularity among firms today as a strategy to cut down costs and at the same time pursue sustainable development (Wilkerson, 2003). According to Srivastava (2007), "GSCM is the practice of incorporating environmental thinking into logistics chains in ways that reduce the environmental impact of supply chains through ecological design, green purchasing, green distribution and reverse logistics." Today, the practice has captured the attention of most managers because it helps firms to conserve the environment while at the same time reducing costs and increasing operational

efficiency (Yunus & Michalisin, 2016). The economic benefits of GSCM strategy arise from recycled products, reuse, and reduced manufacturing cost, improved brand image and reduced legal risks. For the purpose of this research, Srivastava (2007) definition of GSCM will be adopted.

GSCM strategy encompass all activities regarding a firm's environmental management principles from product design, order processing, sourcing, manufacturing, packaging, logistics and distribution (Machogu, 2013). GSCM strategy include green procurement, green distribution, reverse logistics practices (reuse, recycling, re-manufacture), and green packaging (Srivastava, 2007). Therefore, successful GSCM strategy should run through the entire supply chain, from supplier selection and procurement, product design, manufacturing, assembling, consumer choice of product and product end-life management.

1.1.2 Drivers of GSCM Practices

The drivers of GSCM practices are the factors, both within and outside the organization that push the organization to adopt GSCM practices (Lee, 2008). According to Gandhi, Mangla, and Kumar (2015), the major drivers of GSCM adoption are government pressure, competitor strategies, cost-reduction initiatives and corporate social responsibility. Holt and Ghobadian (2009) identified government regulation and internal drivers as the leading influencers of GSCM adoption, while factors such as social pressures and customers pressure had the least influence. According to Machogu (2013) and Ali (2021) "staff training impacted GSCM implementation to a greater extend, followed by top management support, strategy communication and least market structure. Key drivers for GSCM adoption were government regulation, cost reduction initiative, market structure and competition.

1.1.3 The Public Universities in Kenya

As of 2020, the Commission for University Education lists 35 public universities that have received full accreditation. These universities were founded by an institutional act of parliament under the Universities Act, 2012, which addresses the creation, accreditation, and administration of higher education institutions (Commission for University Education, 2020). In order to promote, regulate, monitor, and handle all things pertaining to university education, all public universities in Kenya are accredited by CUE, to which they are subject to oversight.

The university education system has greatly contributed to the Kenyan GDP both directly and indirectly. The sector creates employment for the teaching staff as well as non-teaching staff (Obiso, 2011). Beyond the confines of the campuses, the positive impact of public universities is experienced in every corner of the community." New knowledge and technologies from the universities have led to new discoveries that transform life and help solve evils such as diseases and food security (CUE, 2021). Despite their significant contributions to the Kenyan economy, these institutions are now dealing with a serious challenge of inadequate funds to run operations (CUE, 2021).

Most of these institutions are sinking in debt, and some have been forced to retrench and trim down some programs to cut down costs. Another big challenge faced by these learning institutions is compliance with environmental laws and standards. The universities engage in activities that commission considerable amount of pollution to the environment (NEMA, 2010). These include transportation operations, construction activities, waste management and end-of-life disposal of assets and products. They also utilize important naturally occurring resources mostly water and energy, which need to be used sparingly (NEMA,

2010). A study on the adoption of GSCM among public universities would help these institutions understand how they can reduce their costs of operation and improve their compliance with environmental standards.

1.2 Statement of Research Problem

Managers today are facing increasing pressure to adopt strategies that help them gain a competitive edge and at the same time, remain socially and economically sustainable (Rivera, 2004). Khan and Dong (2017) proposed that GSCM practices have the potential to help firms take control of the resulting impact of their activities such that they don't pollute the environment, and simultaneously yield increased efficiency through reusing, recycling and improved brand image (Zhu & Sarkis, 2004). Despite the evident benefits of GSCM practices to address contemporary organizational issues like economic, social and environmental sustainability, Machogu (2013) and Ali (2021) observed some organizations have a very low level of GSCM practices adoption. This research therefore aimed at revealing some of the barriers causing slow adoption of GSCM in organizations, specifically public universities in Kenya. Considering that universities are involved in activities such as transportation, building/contractions, natural resource utilization, waste disposal and management among others, it was essential to provide insights on how public universities can achieve both cost-saving and become more environmentally responsible by conducting research on GSCM in these institutions.

There exists a good number of studies that reveal different results on GSCM practices adoption and the barriers of GSCM adoption. The contradiction in the findings of these studies reveal a research gap to be addressed. Global studies by Holt and Ghobadian (2009) who identified government pressures as the major driver of GSCM adoption contradict

with the findings by Gandhi et al. (2015), who contented government regulations as the biggest driver. Local studies by Machogu (2013); Mwilu (2013) and Mwirigi (2007) agree that GSCM practices have a potential to reduce costs and ensure environmental sustainability of firms. Although these studies propose that GSCM practices have been widely adopted by most organizations, Zhu and Sarkis (2004), Nasiche and Ngugi (2014), and Ali (2021) conflicts these findings by observing that GSCM practices have only been adopted to a smaller extent especially among public institutions. Additionally, most of these studies have over-emphasized GSCM practices such as green procurement, green packaging, supplier management, reverse logistics and green marketing while overlooking green distribution, which is a very common practice hence the need to conduct a research that includes this aspect of GSCM.

A contextual gap can also be identified in studies such as Holt and Ghobadian (2009); Gandhi et al. (2015); Odock (2016); and Zhu & Sarkis (2004) who studied GSCM practices in UK, China and East Africa revealing the need for localized studies. Other studies on GSCM practices by Machogu (2013); Obiso (2011); Mwirigi (2007) and Mwilu (2013) were conducted in manufacturing, pharmaceutical and public research institutions, hence the need to conduct research specific to public universities in Kenya.

Although Ali (2021) studied SSCM practices in the context of public universities in Kenya, there is a methodological gap that needs to be addressed as the study sampled only those universities in Nairobi, Kenya. Machogu (2013) on GSCM strategy implementation in the Kenyan manufacturing sector used a case study and thus focusing only on a single firm making it difficult to generalize the findings to the entire manufacturing firms. This study will conduct a census on all the universities across the country that rely on funding from

the government, thus eliminating the chances of sampling bias and also providing findings that are more generalizable.

The discussion above reveals conceptual and contextual as well as methodological gaps that need to be addressed. Despite the potential economic and ecological benefits of GSCM adoption that can help these institutions of learning improve their efficiency and sustainably realize growth, there are few studies that explain the level and nature of GSCM practices adoption in the public university sector in Kenya. This study was therefore to address this knowledge gap studying GSCM Practices in Kenyan public universities.

1.3 Research Objectives

The objectives of this study included:

i. To find out the extent of adoption of GSCM practices among public universities in Kenya
ii. To establish the drivers of GSCM practices adoption in public universities in Kenya
iii. To identify the barriers to the adoption of GSCM practices among public universities in Kenya.

1.4 Research Questions

i. To what extent have public universities in Kenya adopted GSCM practices?
ii. What are the drivers of GSCM practices adoption in public universities in Kenya?
iii. What are the barriers to the adoption of GSCM practices among public universities in Kenya?

1.5 Value of the Study

This research is of benefit to the management of the public universities by equipping the management with information that proves valuable to the management in understanding

what drives GSCM adoption, and the barriers faced. With that knowledge, the management can plan how to better achieve the full benefits of GSCM practices by addressing the key success factors and the challenges of GSCM adoption.

Policy makers in the Government of Kenya (GoK) can also find the research helpful with regard to policy-making and implementation of environmental protection regulations. The findings of the research can aid government regulators like NEMA understand the value of GSCM in enhancing environmental sustainability and thus adopt policies to create an enabling environment. The GoK can also rely on the results and recommendations of the study in implementing policies that can help public universities to better handle the barriers of GSCM adoption.

The findings of the research are of use to both scholars and academicians. It gives a foundation for further research on other institutions in the education sector especially the private universities to examine how GSCM is practiced in those institutions. The research is also of importance to future researchers in the identification of gaps in the research flow and introduces new knowledge in the field of GSCM. The findings of the research also inform academicians on the factors driving GSCM adoption and the internal as well as external barriers faced in the adoption of GSCM.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Chapter two of this research reviews the literature from journal articles and other publications related to GSCM. Also, included in this chapter are the theories supporting this study and empirical discussion on what factors drive firms to adopt GSCM practices and the barriers that confront firms during GSCM adoption. To conclude the chapter, the literature reviewed is summarized to reveal the research gaps highlighted and finally, the researcher variables are conceptualized in a conceptual model.

2.2 Theoretical Framework

Three theories: the Tesource-Based-View, Stakeholder Theory and the Institutional Theory formed the foundation of this research. The theories present ideas and perspectives upon which the relationship between variables in the study are hinged. In this study, institutional theory was the overarching theory.

2.2.1 Resource Based Theory (RBV)

The RBV was proposed by scholars and business people such as Birger Wenerfeit, Prahalad and Hamel, Spender and Grant. The RBV posits that organizations should re-evaluate their potential and make good use of the resources own by the firm to compete more favorably in the market (Barney, 2001). Some of the resources proposed by the RBV include both tangible and intangible assets (Barney, 2015). While the tangible resources require high capital investment to acquire, the intangible resources can be shared through collaborations and partnerships (Gavronski, 2011).

As the RBV posits, strategies such as GSCM can help an organization make good use of it to achieve a competitive edge over its competitors who do not employ GSCM (Khan &

Dong, 2017). GSCM help firms to achieve cost saving through recycling and reuse practices (Machogu, 2014) which can help universities cut down costs. In addition, proper implementation of GSCM practices help a company to mitigate its impact of the environment and even avoid legal costs of non-compliance with environmental regulations (Gavronski, 2011). The RBV was important to this study as it helped explain the relevance of GSCM practices in the application of firm resources to cut down costs and achieve environmental sustainability.

There are several criticisms of the RBV. Some of the major criticisms that have been cited include the theory simply assumes that all organizations will have resources that can be developed to achieve competitiveness (Machogu, 2017). Instead, the theory should critically examine how firms can acquire key capabilities. Another criticism is that it is difficult to find a resource that satisfies Barney's (2001) Valuable, Rare, Low-Imitability and Organized to achieve value (VRIO) criteria. Critics believe that most of the resources will lack one or two elements of the criteria. Although these criticisms exist, the RBV can still explain why firms adopt GSCM.

2.2.2 Institutional Theory

The institutional theory was proposed by Shannon in 1993 and is a theory explaining how organizations gain their legitimacy through their interactions with the external environment (Amenta & Ramsey, 2010). The theory explains the how economic, political and social systems affect the firm's strategy formulation. The three major isomorphic drivers of the institutional theory are the coercive, normative and mimetic (Amenta & Ramsey, 2010). Coercive drivers exert pressure on organizations to adopt certain practices and are usually from powerful players in the external business environment (Kiptengei, 2014). The

coercive pressures of governments have pushed business organizations to GSCM practices that reduce the impact of organizations on the environment as supported by studies such as Sang (2022) who asserted that GSCM positively influences profitability and increases organization's compliance with environmental requirements.

Normative drivers arise from social pressure and drive organizations to adopt policies that make the organization's activities legitimate (Amenta & Ramsey, 2010). Normative drivers like consumers and other social groups pressurize organizations to go green. Such interest groups have a strong influence on a firm's actions that affect the environment or even the society (Amenta & Ramsey, 2010). Customers, through their bargaining power of freedom to buy or not to buy n organization's products can influence a firm to take a particular direction. These assertions have been supported by studies like Kiptengei (2014) who posited that as customers and the society become environmentally conscious, they can influence a firm to produce green products that meet their needs.

Mimetic drivers influence organizations to mimic the strategies undertaken by similar firm in their way to success (Kiptengei, 2014). Such drivers direct organizations to adopt GSCM practices so as to equally benefit from competitor strategies (Amenta & Ramsey, 2010). Machogu (2013) established that some manufacturing firms who had adopted use of solar energy had recorded higher cost saving and increased profitability. This realization triggered other manufacturers who lagged behind to emulate the move to greener sources of energy, such as the use of solar energy. This explains how organizations adopt GSCM practices to cope up with competition and achieve better performance. The institutional theory therefore proved to be of value in the study when explaining the different drivers of

GSCM practices adoption in organizations and helped categorize these drivers depending on the originating forces.

The shortcomings linked to this theory include the impossibility of meeting all the interests of the different stakeholders involved equitably (Freeman, 2015). The diversity of the interest groups involved and complexity of their interests means that some of the stakeholders will be prioritized than others (Freeman, 2015). This helps explain why some firms prioritize the economic dimension of sustainability and forget the environmental and the social dimensions as the investors have greater power to influence decisions. However, firms that can achieve a balance between the social, environmental and economic interests have fared well compared to those who have not (Odock, 2016).

2.2.3 Stakeholder Theory

The stakeholder theory is anchored on the need to recognize that the organization is obliged to key interest groups who are likely to be affected by the actions of the organization (Freeman, 2001). These interest groups include shareholders, the customers, suppliers, the general public and financial institutions who have expectations on the organization and experience the effects of the organization's actions (Odock, 2016). Since the different groups have different interests, there is incompatibility of expectations that the organization need to manage and ensure a balance. Managers are hence faced with a tough challenge of achieving a balance between all the demands of these stakeholders since they are all important (Chan et al., 2018). For instant, customers are vital for the firm to generate revenues and might demand green products which the investors might deem unfavorable due to high initial cost of investment in green production. Since customers can shift to other

products that meet their need for greener products, the managers will have to rethink their production strategy regardless.

Among the many interests, some stakeholders expect that the organization undertake measures aimed at managing the environmental impacts of its operations (Kinoti, 2012). Manufacturers engage in activities that pressurize the environment through increased stress on natural resources such as water, air pollution, solid and hazardous waste generation, water pollution and landfill (Odock, 2016). It is therefore the expectation of stakeholders that the manufacturing firm take the responsibility of rectifying their mess on the environment (Odock, 2016). Complying with stakeholder expectations on environmental consciousness enhances the corporate image of the firm (Freeman, 2015). By gaining legitimacy as an environmentally conscious organization, the firm can easily achieve environmental sustainability throughout its supply chain by attracting suppliers and customers who are environmentally conscious (Sang, 2022). This theory was therefore useful in understanding the drivers of GSCM adoption as influenced by various stakeholders.

The institutional theory explains how external environment forces drive business organizations to adopt GSCM strategy. The theory however is criticized for not critically examine the interaction between the external drivers and the internal business factors that affect the adoption of GSCM strategy (Machogu, 2017). It is also not clear how ecological thinking and ethical values affect a firm's response to environmental issues. In the global perspective, multinational supply chains adopt green practices as other members of the chain adopt such practices (Gandhi et al., 2015). However, it is not clear how the diffusion mechanism works for such collaboration and more research is required.

2.3 Green Supply Chain Management Practices

GSCM is increasingly being adopted by many organizations in effort to strengthen the weaknesses of traditional supply chains such as environmental inefficiency (Srivastava, 2007). Both academicians and practitioners advocate for GSCM as a means of reducing waste and preserving the natural resources (Srivastava, 2007). Kinoti (2012) who studied GSCM as a marketing tool observed that those firms that used GSCM as a marketing strategy were more feasible, more credible and resulted into better relationships. Furthermore, the study observed that a well-established sustainability plan is essential in attracting top talent. Corporate strategies like GSCM are adopted by businesses to enhance supply chain efficiency and build distinct capabilities to benefit both financially and environmentally (Kiptengei, 2014). Odock (2016) emphasized on the importance of partnerships when implementing GSCM practices as it ensures consistency of practices and standards through the supply chain. Besides, the study observed that it is much difficult for a firm to successfully adopt GSCM without involving its suppliers and other downstream players since they form a crucial part of the firm's supply chain network. Some of the common GSCM practices are discussed in the paragraphs that follow.

2.3.1 Green Procurement

Green Procurement (GP) is the practice of sourcing sustainably by considering the potential impact a product or materials might have on the environment before making a purchasing decision (Chan, Tiwari, Ahmad, Zaman & Sia, 2018). GP can also be viewed as the power that resides in a customer to choose those products that benefit the environment and ensure sustained shared value for both consumers, the environment and the manufacturer (Commission for Environmental Cooperation, 2009). Green purchasing is becoming a

widely accepted practice for firms and individual customers as a result of the increased awareness on the need to conserve the environment and source sustainably (Chan et al., 2018).

GP involves the practices such as purchasing products that are made from recycled raw materials. Most organizations are embracing recycling as a way of reducing the cost of production, while simultaneously reducing the amount of pollution commissioned to the environment (Chan et al., 2018). GP also includes the procurement of products that utilize less energy. The practice also includes buying food that is grown using organic fertilizer, buying products that are meant for recycling, buying vehicles that use alternative sources of energy, and products that do not deplete the ozone-layer (Chan et al., 2018). Also, companies that practice GP buy products packaged in bio-degradable packaging material. Firms that practice GP have come up with supplier selection criteria that aim at selecting those suppliers who have considered environmental concerns in their product design (Chan et al., 2018). Additionally, GP requires that a firm work with those suppliers who have adopted systems and procedures for the production and supply of green products.

2.3.2 Reverse Logistics

Reverse Logistics (RL) refers to the planning, controlling and management of the effective flow of material, inventories, goods and information in the reverse direction (Banihashemi, Fei & Chen, 2019). For example, the returning of undesired goods from a customer to the manufacturer. The purpose of RL is to add value or to ensure proper waste disposal. Reverse logistics requires a properly coordinated and well-defined plan for the reverse flow of products that have already been supplied (Banihashemi et al., 2019). However, some firms have only invested on the forward flow of goods, materials and information with

little regard to the return logistics. As Odock (2016) reports, such firms have had challenges in delivering to their customers and have been forced to contract third-party logistics (3PL) providers to manage the reverse flow of goods and information. This underlines the crucial importance of reverse logistics in customer service and supply chain performance.

Reverse Logistics practices include product recalls, recycling, re-manufacture, re-use and return of empty packaging materials (Sarkis, 2007). Practices like remanufacturing and recycling requires the acquisition of specialized technologies that support the requisite business processes (Banihashemi et al., 2019). Most companies have adopted RL as a measure to manage their waste through recycling and returns (Muttimos, 2014). Also, reverse logistics improve customer service since it allows the return of products deemed undesirable for customers once they have been distributed to the market (Sarkis, 2007). Organizations are also RL in effort to bring down the cost of material by allowing customers to return empty packaging material as well as used products for recycling ((Banihashemi et al., 2019).

2.3.3 Green Logistics

Green Logistics (GL) is defined as a corporate strategy that defines a set of company policies and procedures whose objective is to reduce environmental pollution resulting from the distribution activities of a firm (Gavronski, 2011). GL means mapping the logistics footprint of an organization and devising measures to minimize carbon emissions. Shipping and transportation have been marked as the major source of environmental pollution in the logistics system (Zhu &Sarkis, 2004). Different transport modes use fossil fuel that emit toxic gasses like carbon dioxide besides causing noise pollution. To control

the negative effects of distribution systems on the environment, firms are increasingly adopting GL.

GL practices include all the initiatives in areas of inventory management, transportation, distribution, warehousing and shipment aimed at environmental promotion and protection (Delmas & Montiel, 2009). GL incorporates the formal introduction of freight consolidation in transport management as a means to optimize volume of a single load, route optimization to choose the shortest route or the one that ensures maximum value, return trips (Delmas & Montiel, 2009). GL also advocates for the use of vehicles that utilize renewable sources of energy in transportation. Green logistics involves working with suppliers and other supply chain partners such as 3PLs or 4PLs to jointly come up with shipping options that "green the whole SC and reduce the carbon footprint of the firm (Machogu, 2013).

2.4 Drivers of GSCM Practices

Many organizations have adopted GSCM as a mechanism to enhance operational efficiency and preserve the environment. Sustainable supply chain practices help the organization to achieve long-term value for the organization, and the society (Lee, 2008). There are various drivers both within and outside the organization that drive organizations to adopt GSCM practices. Gandhi et al., (2015) analyzed the factors affecting implementation of GSCM among industrial manufacturers in India and found that top management support, professional skills and cost factors were most influential when it comes to GSCM implementation. The study also found that major drivers of GSCM adoption were government pressure, competitor strategies, cost-reduction initiatives and CSR. In the UK, Holt and Ghobadian (2009) studied the drivers of GSCM adoption among

UK firms and found that government regulation and internal drivers were the leading influencers, while factors such as social pressures and customers pressure had the least influence. Locally, Machogu (2013) found that staff training impacted GSCM implementation to a greater extend, followed by top management support, strategy communication and least market structure. Key drivers of GSCM adoption were government regulation, cost reduction initiative, market structure and competition. According to Ali (2021), public universities are increasingly becoming aware of environmental concerns and some have undertaken measures to conserve the environment. This this trend is motivated by institutional pressures aimed at ensuring sustainable development (Sang, 2022).

The leading driver of GSCM practices adoption as cited by (Sang 2022; Machogu (2013) and Kiptenga'ei (2014) is pressures from the government. The government of Kenya has provided legislation to govern industrial practices and activities to ensure environmental preservation. The GoK for instance, has given the mandate of regulating environmental impact of company activities to NEMA. The government has programs to promote adoption of systems to manage the environmental effects of a firm's activities. The government can also encourage the adoption of GSCM through incentives, education and tax breaks (Scupola, 2003).

Besides government pressures, the market also influences the adoption of green initiatives. Environmentally conscious customers define the market and the increasing demand for green products drive organizations to adopt GSCM practices. According to Zhu and Sarkis (2004) customers are increasingly becoming environmentally aware and are therefore, demanding products and services that meet this preference. Responding to the customer

requirements for green products lead to customer satisfaction and thus give such firms a competitive edge (Lee, 2008). Additionally, social pressures from the media and communities can push a firm to adopt GSCM practices. The increasing concerns on climate change and increased public concerns about the environment as well as technological innovations have promoted GSCM practices implementation (Lee, 2008).

Organizations also mimic the strategies undertaken by competitors as a way of cutting down cost and remaining competitive. Mimetic drivers include mimicking the adoption of GSCM practices by a rival firm (Amenta & Ramsey, 2010). Since GSM practices have been associated with improved efficiency and cost reduction, an organization can adopt GSCM practices to gain similar advantages to a rival organization that has implemented GSCM practices (Lee, 2008). Such competition lead to improved quality of products and greener environment while helping the firms achieve operational efficiency.

Internal factors such as company strategy also influence adoption of GSCM practices to support company initiatives such as corporate social responsibility (CSR). CSR poises that the organization is socially obliged to the society it operates in (Smith, 2003). Most organizations have adopted GSCM practices as a way of ensuring a clean environment for the communities they operate in. Socially responsible organizations set a budget to finance such activities as waste management and recycling in order to reduce landfill in the communities they operate in. Such initiatives promote a good relationship with the society and build a good reputation which is rewarded by increased demand for the organization's products (Smith, 2003).

Other drivers of GSCM practices adoption include the need to cut down costs, such as the cost of energy. Zhu and Sarkis (2004) who conducted a study on the operational

performance of early adopters of GSCM strategy among manufacturers in China found that green supply chain adoption resulted to reduction in distribution cost, improved distribution, increased supply chain efficiency and higher profits. Increasing energy costs can force a firm to switch to renewable energy sources like solar power which is relatively cheaper and sustainable (Walker, 2008). Mwilu (2013) asserted that GSCM adoption positively impacted economic and environmental performance of a firm and recommended organizations to adopt more GSCM practices to experience these benefits.

2.5 Barriers of GSCM Practices Adoption

The factors that derail the successful adoption of GSCM practices arise from both within and outside that organization. Zhu and Sarkis (2004) who studied GSCM adoption among manufacturers in China contented that most firms had lowly adopted GSCM practices owing to internal management factors and external factors such as government regulations The internal barriers of GSCM arise from within the organization and limit the organization's capability to fully employ GSCM practices (Walker, 2008). On the other hand, external barriers entail forces outside the organizations' control and limit the firm's ability to successfully adopt GSCM practices.

Internal barriers to implementation include lack of management support. Holt and Ghobadian (2009) highlighted challenges of GSCM adoption to include lack of adequate support from the top management, inadequate information about GSCM implementation and high initial cost of adoption. The top management have a can dictate the level of GSCM adoption since they make corporate decisions and control the allocation of resources (Cramer & Hemel, 2002). Besides, some organizations claim high cost of implementation with less perceived benefits (Lee, 2008). This notion could be due to lack of a strong

business case to justify the cost of GSCM adoption. Some organizations lack the necessary technology to support GSCM initiatives. Mwirigi (2007) and Mwilu (2013) cited lack of necessary technology and infrastructure as a major challenge to GSCM implementation, among other barriers. Essentially, GSCM practices such as recycling require special technologies, which some firms lack. Other internal barriers to GSCM adoption include inadequate information about GSCM best practices, lack of adequate staff training, as well as inconsistent corporate strategies.

External barriers include lack of government support. According to Zhu and Sarkis (2004), most Chinese manufacturing firms had lowly adopted GSCM practices owing to external factors such as government regulations. The government has a very important role to promote the adoption of GSCM practices among public and private organizations (Scupola, 2003). The government can provide incentives for GSCM implementation as well as tax breaks and providing relevant training on GSCM practices implementation (Scupola, 2003). Other external barriers to adoption can include unfriendly regulation, lack of necessary infrastructure to support GSCM practices, and the laxity on the side of suppliers to support green initiatives (Walker, 2008).

2.6 Summary of Literature Review and Research Gap

A number of observations were made from the literature reviewed on the drivers and barriers of GSCM adoption. The literature revealed that GSCM management practices are evident both globally and locally in Kenya. However, no specific known research that has focused on GSCM practices in public universities in Kenya, despite being a big contributor to Kenya's social, political and economic development. Additionally, most studies focused on GSCM practices such as green marketing, design for environment, green distribution,

green packaging but less attention was paid to green procurement and green logistics. This study was therefore geared towards filling this research gap by examining GSCM among public universities in Kenya. The summary of major empirical studies, that point out to the research gaps are summarized in table 2.1

Table 2:1: Summary of Literature Review and Research Gaps

Author(s)	Focus of the Study	Key Findings	Research Gap	How This Study fills the gap
Holt & Ghobadian (2009)	GSCM adoption among UK manufacturing firms	Government regulation, internal factors, social and customer pressures are leading drivers of GSCM practices.	Conducted in UK	Research in the Kenya context
Gandhi et al. (2015)	Factors affecting adoption of GSCM in Indian industries	Top management support, human capital expertise and financial factors affect GSCM adoption. Drivers include government pressure, competitor strategies, cost-reduction initiatives and corporate social responsibility	Conducted in India	Need for a Kenya-based research
Zhu & Sarkis (2004)	GSCM practices and operational performance of Chinese manufacturing firms	GSCM resulted to reduction in distribution cost, improved distribution, increased supply chain efficiency and higher profits.	A global study in China	The study will be conducted in Kenya

Odock (2016)	GSCM Practices and Environmental and Operational Performance of ISO 14001 Manufacturing Firms in East Africa	GSCM Practices are positively linked with environmental and organizational performance.	The study generally focused on East Africa and was conducted in the manufacturing industry for ISO 14001 Certified organizations	This study will be done in pharmaceutical firms in Nairobi County, Kenya
Machogu (2013)	Factors affecting implementation of GSCM strategy in manufacturing firms in Kenya	The key drivers of GSCM are government regulation, competition, market structure and cost reduction initiatives. Staff training, Top management support, strategy communication and market structure affect GSCM implementation.	Adopted a case study for a single firm.	This research will focus on many organizations, making it more generalizable
Ali (2021)	Sustainable supply chain practices and operational performance of public universities in Kenya	Slow adoption of sustainable supply chain practices owing to lack of management skills, inadequate support system and industry barriers.	Focused on SC sustainability	This study will focus specifically on GSCM practices.

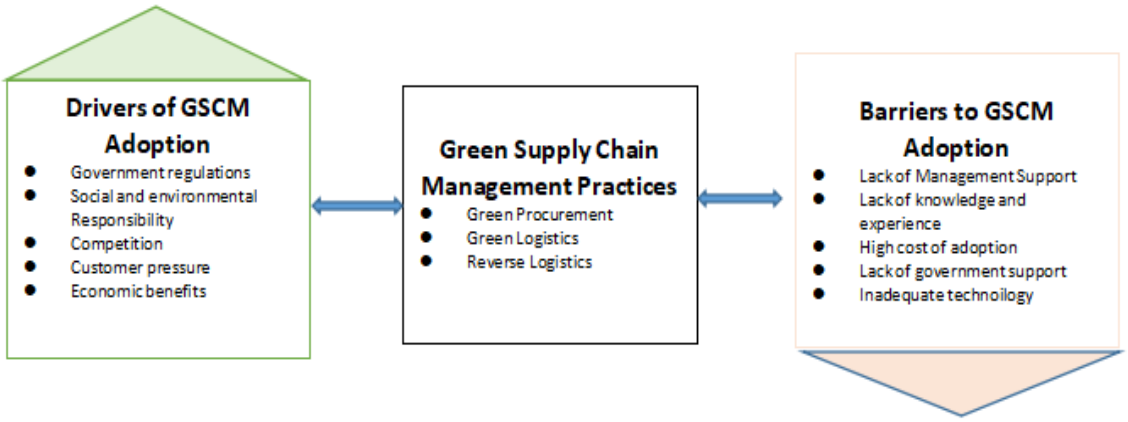
Sang (2022)	GSCM Practices and Operational Performance of Public Universities in Kenya	GSCM Practices positively correlate with Operational Performance of Public University in Kenya.	Focused on level of adoption and challenges of GSCM Practices adoption and left out the drivers of GSCM Practices	The study will address the institutional drivers of GSCM Practices
Mwirigi (2007)	GSCM practices and manufacturing firms in Kenya	Most manufacturing firms have moderately implemented GSCM	Focused on manufacturing firms	This study will focus on public universities in Kenya
Mwilu (2013)	GSCM implementation in research institutions in Kenya	GSCM is moderately adopted due to lack of government support and necessary infrastructure	Conducted in research institutions	The study will be done in public universities
Obiso (2011)	GSCM practices among petroleum marketing firms in Kenya	GSCM is implemented to a smaller extent	Research focused on green distribution, internal environment management and investment recovery	This study will focus on other facets of GSCM practices not covered

Source: Researcher (2023)

2.7 Conceptual Framework

A conceptual framework is the visual illustration of the different variables of research and maps out how the objectives come together to draw coherent conclusions (Lakshmimeera & Palanisamy, 2013). The study aimed to establish the drivers and the barriers of GSCM adoption. It was hypothesized that the drivers (government regulations, social and environmental responsibility, competition, customer pressure and economic benefits) encourage the adoption of GSCM practices while the barriers (lack of management support, lack of knowledge and experience, cost of adoption, lack of government support and inadequate technology) discourage the adoption of GSCM practices.

Figure 2.1: Conceptual Framework



Source: Researcher (2023)

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

Chapter three focuses on the methodology that the researcher followed to gather and analyze data. It details the targeted population and the procedures for sampling respondents, as well as how data was analyzed presentation presented.

3.2 Research Design

Descriptive research design was used in this research. This design was chosen as it allowed the collection of quantitative data by unveiling the what, how and where of a given situation or phenomenon (Polit, 2006). Furthermore, Kothatri (2007) asserts that descriptive research design is meant for studies whose main objectives include establishing, identifying or describing the behavior or existence of aspects of phenomena in the study population (Kothari, 2007). As Saunders, (2003) contents, descriptive research design allows for the use of data collection methods that address the "what" of the study problem. This study was geared toward understanding what the barriers of GSCM adoption were, what the drivers of GSCM adoption were, and what the level of GSCM practices adoption was and the research design allowed for use of questionnaires to collect relevant data. Furthermore, descriptive research design allowed for generalization of findings to the sampled population (Kothari, 2007). As such, the use of this research design enables the findings to be generalized to the entire public university community.

3.3 Target Population

The target population for the study were the public universities in Kenya. These institutions were chosen for the study as they are funded with public money and most of them are

currently crumbling under debts. It was therefore the interest of the researcher to study how these institutions were embracing cost-efficiency and environmentally sustainable initiatives to become sustainable. The research design adopted also allowed generalization of findings, which can give insights on GSCM practices in the high education sector in Kenya. The CUE published a list of 35 chartered public universities in Kenya as of December 2022 **(see Appendix I**). Since the target population was considerably small, all the 35 universities were studied through census.

3.4 Data Collection

The researcher gathered primary data using structured questionnaires. Use of structured questionnaires allowed the collection of quantitative data and eliminated the bias associated with other instruments such as interviews where individuals respond to questions "in theory own words." The questionnaires were structured into four sections: section A captured the biographic data of respondents. The general information collected in this section helped to understand the experiences of the respondents in regards to the field of interest, their level of qualification in the positions held and their tenure of office. The other section was labeled "Section B" and focused on the extent of GSCM adoption and the third section was labelled "Section C" which gathered information on the drivers of GSCM adoption. The lasts section labeled "Section D" focused on the barriers of GSCM adoption. A five-point-Likert scale was used with the closed ended questions focusing on extent of GSCM practices adoption, drivers of GSCM practices and barriers of GSCM adoption to ensure consistency of responses for easier data analysis. The questionnaires were administered to the senior and middle-level officials in procurement, stores, transport/logistics, and campus management or the equivalents in the universities since they were believed to possess

adequate knowledge about GSCM practices in their campuses and are key decision makers for corporate strategies. The questionnaires were administered online using Google forms. This approach was more convenient since the population was widely spread geographically, and was cost-effective and time-saving allowing the researcher to gather adequate data despite time limitations (Dhanavandan, 2016). It also gave the respondents the space to read, understand and respond to the questions appropriately.

3.5 Data Analysis and Presentation

The data gathered first underwent editing to ensure completeness and consistency, and coding before entering into Microsoft Excel for analysis. Data on general information of respondents was analyzed by calculating frequencies and percentages to summarize observations. For objective (i) which focused on the extent of GSCM practices adoption, The degree of each GSCM practice adoption in Kenyan public universities was shown by computing means and standard deviations for each of the GSCM practices. For objective (ii) which focused on the drivers of GSCM practices adoption, descriptive statistics was relied upon to calculate the means and standard deviations depicting the major to the least drivers of GSCM adoption. Similarly, for objective (iii) on the barriers of GSCM adoption, the information collected was analyzed by means of descriptive statistics where means and standard deviations were used to illustrate the largest to the least barrier of GSCM adoption. The data was presented using tables.

CHAPTER FOUR: DATA ANALYSIS, FINDINGS AND DISCUSSIONS

4.1 Introduction

The analysis of data, study conclusions, and result interpretations are covered in Chapter 4. It discusses the extent to which GSCM practices are being adopted in public universities,

as well as the factors that encourage and hinder this adoption, and it makes connections between the findings and both divergent and convergent literature.

4.2 Response Rate

The study targeted the 35 public universities in Kenya listed by the Commission for University Education (CUE, 2022). The questionnaires that were completely filled were 28 out of the 35 issued questionnaires, representing 80% response rate. Barclay, Todd, Finlay, Grande and Wyatt (2002), asserted that a response rate of more than 70% is considered adequate for analyzing, presenting and interpreting the findings of a study. Furthermore, Sang (2022) relied on a relied on a 78% response rate came up with findings that were generalizable and conclusive results that were used to make concrete recommendations. As such, this study attained a response rate sufficient to address the goals of the study and provide answers to the research questions. .

4.3 Respondents' General Information

This section details the background information of respondents regarding their designation, level of education, the period for which the organization has operated, and the length of time they have served in the organization.

4.3.1 Designation of Respondents

Regarding the the position held by the respondents, the highest number of respondents were transport or logistics managers at 28.57%, followed by university managers and procurement managers at 25% and lastly store managers at 21.43% (see table 4.1). The findings indicate that the responses were distributed across the different targeted departments and represented the opinions from varied all the departments that the study sought responses from. Furthermore, the respondents were in managerial positions and thus

gave expert opinions from their experiences as managers and the officers in-charge of the various functions.

Table 4.1: Designation of Respondents

Designation	Frequency	Percentage (%)
University Manager or the Equivalent	7	25.00
Procurement Manager	7	25.00
Transport/Logistics Manager	8	28.57
Stores Manager	6	21.43
Total	**28**	**100**

Source: Research Data (2023)

4.3.2 Level of Education

The questionnaire required respondents to fill out the highest academic qualifications obtained. It was revealed that 53.57% of those who answered the questionnaires cited that they had a degree being the highest academic qualification obtained, followed by 32.14% who had obtained a diploma, and 10.71% who were holders of a postgraduate qualification. Only 3.57% of the respondents had a certificate. Only 3% were holders of a certificate as their highest academic qualification which is a very small ration of those who were highly qualified (table 4.2). It can therefore be noted that more than 64% those who responded held a degree qualification and above, indicating that the vast majority of responders had a solid background in education in their field of work and thus gave competent responses.

Table 4.2: Level of Education of Respondents

Education Level	Frequency	Percentage (%)
Certificate	1	3.57
Diploma	9	32.14
Degree	15	53.57
Post Graduate	3	10.71
Total	**28**	**100**

Source: Research Data (2023)

4.3.3 The Length of Time the University has been in Operation

The research sought information on the period for which the university has operated and the study findings show that most of the universities have operated for quite a while, with 67.86% operating for over 11 years. Both those that had operated for 2 to 5 years and 6 to 10 years represented 14.29% for the two categories while those universities that had been in operation for less than two years represented 3.57% (table 4.3). Therefore, more than 81% of the universities had been in operation for more than 6 years and this is considered long enough to embrace GSCM practices, observe and acknowledge the drivers of GSCM practices adoption and the barriers faced. Having operated for more than 6 years, the universities have also had the chance to reevaluate their sustainability approaches and considered GSCM as an option.

Table 4.3: Period for which the University has Operated

Time in Years	Frequency	Percentage (%)
11 and above	19	67.86
6 to 10 years	4	14.29
2 to 5 years	4	14.29
Less than 2 years	1	3.57
Total	**28**	**100.00**

Source: Research Data (2023)

4.3.4 Length of Service in Current Position

On the tenure of office for the respondents it was found that that 50% of those who responded had served in their current position for 2 to 5 years, 21.43% have served for less than 2 years, and 17.86% have served for 6 to 10 years while 10.71% have served for more than 10 years as presented on table 4.4. This is a clear indication that more than 78% of those who responded have held current positions for 2 years and above which means the respondents have adequate experience in the positions and gave expert opinions on the questions asked. The officers had also stayed in the organization long enough to give a true opinion on what has been the norm of the organization in regard to the statements in question.

Table 4.4: Respondents' Tenure of Office

Time in Years	Frequency	Percentage (%)
Over 10 years	3	10.71
6 to 10 years	5	17.86
2 to 5 years	14	50.00

Source: Research Data (2023)

4.4 Extent of GSCM Practices Adoption

Regarding the level to which each of the universities had adopted GSCM practices, green procurement, green logistics and reverse logistics were considered and the results discussed if the following sub-headings.

4.4.1 Adoption of Green Procurement

As for the extent of green procurement adoption, the study findings revealed that the universities practiced buying of energy-efficient products or products produced under energy efficiency standards to a moderately-large extent (mean= 3.5 and SD= 1.2619). It was followed by buying products for which the packaging material is biodegradable or recyclable adopted to a moderately-large extent (mean=3.43 and SD= 1.2889). Purchasing energy saving equipment followed also adopted to a moderately-large extent (mean= 3.40 and SD= 1.1227). Adopted to a moderately large extent was prescribing the environmental standards to suppliers that purchased products must meet in their design specification with a mean of 3.39 and SD 1.1968 then adoption of environmental criteria in the supplier-assessment system (mean= 3.25 and SD= 1.3505). Last was purchase of eco-labelled products with a mean of 3 and SD of 1.12 which was moderately adopted (table 4.5). An overall-mean of 3.33 indicates that green procurement is adopted to a moderately-large extent by the universities.

Table 4:5: Extent of Green Procurement Adoption

Statement	Mean	Deviation
The university purchases Eco-labelled products	3	1.1221
Adoption of environmental criteria into the supplier assessment system	3.25	1.3505
Providing design specification to suppliers that include environmental requirements for purchased items	3.39	1.1968
Purchasing energy saving equipment	3.40	1.1227
Purchase of products that are energy efficient or require less energy to manufacture	3.5	1.2619
Buying products for which the packaging material is bio-degradable or recyclable	3.43	1.2889
Overall Score	**3.33**	**1.2238**

Source: Research Data (2023)

4.4.2 Adoption of Green Logistics

Regarding the extent to which the universities had adopted green logistics, it was revealed that the use of vehicles that are powered by renewable energy was adopted to a moderately-large extent with a (mean= 3.28 and SD= 1.3858). Other green logistics practices adopted to a moderate extent were the formal introduction of freight consolidation and route planning to minimize the number of trips and energy consumption with a mean of 2.92 and SD 1.049 and the formal introduction of freight consolidation aimed at transporting goods more efficiently at mean 2.85 and SD 1.1239. Collaborating with supply chain network partners and players like vendors, 3PL and 4PL service providers to come up with environmentally-friendly purchasing procedures and transportation means was adopted to a moderate extent as suggested by mean= 2.93 and SD= 1.2971. It is therefore clear that GL had been adopted to a moderate extent as suggested by the overall-mean, 2.94 as tabulated in table 4.6.

Table 4.6: Extent of Green Logistics Adoption

Statement	Mean	Deviation
The firm has formally introduced freight consolidation aimed at transporting goods more efficiently	2.85	1.1239
The firm has formally introduced freight consolidation and route planning that minimize the number of trips and energy consumption	2.92	1.049
The firm utilize vehicles that are powered by renewable energy sources	3.28	1.3858
Collaborating with suppliers, vendors, third party logistics (3PL and 4PL) partners to develop environmentally friendly procurement protocols and eco-friendly shipping options	2.67	1.2971
Overall Score	**2.93**	**1.2140**

Source: Research Data (2023)

4.4.3 Adoption of Reverse Logistics

On the identification of the extent of reverse-logistics adoption, the study found that the most widely adopted reverse logistics practice is waste reduction, reuse and recycling with a mean of 3.25 and SD 1.20 and was adopted to a moderately large extent. Management of reverse flow of material and reusing whenever possible followed with a mean of 3.17 each and were adopted to a moderately large extent. The return of used products and empty packaging materials to suppliers for recycling was adopted to a moderately-large extent (mean= 3.14 and SD= 1.32). Therefore, RL practices were adopted to a moderately-large extent as the overall mean, 3.18 suggests (table 4.7).

Table 4.7: Extent of Reverse Logistics Adoption

Statement	Mean	Deviation
The university manages reverse flow of material	3.17	0.9833
Materials reuse whenever possible	3.17	1.1564
Waste reduction, reuse and recycling	3.25	1.2056
The university returns used products and empty packaging materials to supplier for recycling	3.14	1.3253
Overall Score	**3.18**	**1.1677**

Source: Research Data (2023)

4.4.4 Ranking of Extent of GSCM Practices Adoption

The overall means of the GSCM practices were ranked for the most widely adopted to the least. Table 4.8 reveals that green procurement is the most widely adopted GSCM practice to a moderately-large extent with an overall-mean, 3.33 and SD= 1.16, followed by reverse logistics with a (mean= 3.18 and SD= 1.22) also adopted to a moderately-large extent and least adopted is green logistics with a mean of 2.93 adopted to a moderate extent (table 4.8). Therefore, the universities have only adopted GSCM practices to a moderate-extent with green logistics being the least practiced GSCM practice.

Table 4:8: Ranking of Extent of GSCM Practices Adoption

Green Supply Chain Management Practices	Mean	Std, Deviation	Ranking
Green Procurement	3.33	1.1677	1
Reverse Logistics	3.18	1.2238	2
Green Logistic	2.93	1.2140	3

Source: Research Data (2023)

4.5 Drivers of GSCM Practices Adoption

On the identification of the drivers of GSCM practices, the study findings identified that social and environmental-responsibility are the leading drivers of GSCM practices adoption (mean= 3.57 and SD= 1.23) followed by government regulations with a mean of 3.57 SD 1.23 and economic benefits was third (mean= 3.53 and SD= 1.26. Competition is the fourth ranking driver of GSCM practice adoption with a mean of 3.32 and SD 1.12 while customer pressure was the fifth driver of GSCM practices with a mean of 3.29 and SD 1.2954 (table 4.8). It is clear that these drivers pushed the adoption of GSCM practices to a moderately-large extent (overall-mean= 3.484).

Table 4.9: Drivers of GSCM Practices Adoption

Statement	Mean	Deviation
Government Regulations	3.57	1.2301
Social and Environmental Responsibility	3.71	1.2128
Competition	3.32	1.1239
Customer Pressure	3.29	1.2954
Economic Benefits	3.53	1.2614
Overall Score	**3.484**	**1.2247**

Source: Research Data (2023)

4.6. Barriers of GSCM Practices Adoption

As for the barriers of GSCM adoption among public universities in Kenya, it was found that high cost of adoption was the leading barrier of GSCM practices adoption among public universities (mean= 3.25) and (SD=1.12) followed by lack of relevant knowledge and experience in GSCM implementation (mean 3.21, SD 1.42) both of which hindered GSCM adoption to a large extent. Thirdly ranked is inadequate technology with a mean of 3.07 and SD 1.41 which also hindered GSCM practices adoption to a large extent. The other barriers that hindered GSCM practices adoption to a moderately extent include lack

of government support with a mean of 2.96, SD 1.13 and lack of top-management-support (mean= 2.89) and (SD= 1.19), illustrated in table 4.10.

Table 4.10: Barriers of GSCM Practices Adoption

Statement	Mean	Deviation
Lack of management support	2.89	1.1968
Lack of relevant knowledge and experience	3.21	1.4235
High cost of Adoption	3.25	1.1297
Lack of government support	2.96	1.1379
Inadequate technology	3.07	1.4123
Overall Score	**3.076**	**1.2600**

Source: Research Data (2023)

4.7 Discussion of Study findings

The findings on the extent of GSCM practices adoption that green procurement is the most widely practiced GSCM practice followed by reverse logistics both adopted to a moderately large extent converges with Huma et al. (2022) who contended that green purchasing is a commonly practiced sustainable supply chain practice as it supports the production of quality products that are good for both the environment and consumers. Foo, Kanapathy, Zailani and Shaharudin (2019) also observed that green procurement will increasingly grow in importance as a way of integrating customer demands in product design and development. In line with the resource based view, green purchasing reflects innovative utilization of resources to gain competitive advantage for the institution. Kimeu (2015) also asserted that alcoholic beverage manufacturers had adopted reverse logistics practices such as returning empty packaging material to a moderately large extent and green distribution was in the early adoption stages. Sang (2022) ranked green distribution as the third most adopted GSCM practice by the universities and contended that the practice was adopted to a moderate-extent. However, the findings diverge with Obiso (2011) who

concluded that GL was among the widely adopted GSCM practice among petroleum firms on Kenya. Studies such as Rane, Thakker and Kant (2020) maintains that green logistics is gaining traction as a way to reduce carbon emissions and sustainably meet customer demands. Gl also ensures the incorporation of social and environmental concerns into the company's economic pursuits, which is in line with the stakeholder theory that advocates for attention to all relevant stakeholders.

The finding on the drivers of GSCM practices that social and environmental responsibility, government regulations, competition, customer pressure and economic benefits are among the drivers of GSCM practices findings converges with findings by Holt & Ghobadian (2009); Gandhi et al. (2015); Machogu (2013); Ali (2021); Mwilu (2013) and Mwirigi (2007) who contended that the drivers of GSCM practices adoption include government regulation, customer and social pressure, need to drive down cost and achieve competitive-advantage. The study revealed environmental and social -responsibility as the leading driver of GSCM-adoption . However, this finding contradicts with Zhu and Sarkis (2004) who underlined government regulations as the leading driver of GSCM practices adoption. Sang (2022) contended that both government and social pressures strongly influence adoption of GSCM and lead to better performance of institutions of higher-learning in the public sector. The findings are in harmony with the institutional theory that argues that the forces that drive organizations to adopt GSCM practices exist both within and outside the organization and they include coercive government pressures, normative social and customer pressures and mimicking behaviors to cope with market competition.

The findings on the barriers of GSCM practices adoption in Kenyan public universities, are in collaboration with Kimani (2012) who found high initial cost of adoption as the

leading challenges of GSCM practices adoption among mobile telecommunication companies in Kenya. Kimani (2012) posits that although the initial cost of GSCM practices might be high, the long-term positive results on the environment and SC performance justifies the high initial cost. Other concurring studies include Sang (2022); Mwirigi (2007); Zhu and Sarkis (2004) and Mwilu (2013) who posited that lack of relevant technology and knowledge, lack of management support and unfriendly government policies were among the major hindrances of GSCM adoption. The findings are however divergent with Ali (2021) who contended that government support had no effect on GSCM practices adoption.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECCOMMENDATIONS

5.1 Introduction

This chapter summarizes the results obtained from the study for each of the research objectives. It also comprises the conclusion made from the results and spells-out the limitations of the study. The chapter also includes recommendations based on the outcomes of the research and concludes by offering directions to guide future research in the area of GSCM.

5.2 Summary of the Study

The study was conducted to investigate GSCM practices in public universities in Kenya and the researcher was guided by three objective through the study. The first objective that the researcher sought to address was ascertain the level of GSCM adoption among these institutions of higher learning. On the second objective, the researcher sought to understand the factors that drove these institutions to adopt GSCM practices and thirdly, the study aimed to reveal the various barriers that hinder the universities from successfully adopting GSCM practices. The study heavily relied on the institutional theory, the resource-based theory and the stakeholder theory to support ideas and arguments in the study. A descriptive-research design was the approach used in the study where a census was conducted on all the 35 public universities in Kenya. A questionnaire with closed ended likert questions aided data collection on the extent of GSCM practices adoption, influencing factors and the setbacks of GSCM practices among public Universities in Kenya.

About the degree of adoption of GSCM practices, the study found that green procurement was the most widely adopted GSCM practice by these public institutions and was adopted to a moderately large extent. GP was practiced through the buying of items that were energy-efficient or those that required less energy to produce, giving consideration to biodegradable and recyclable packaging before purchasing items, procuring energy-saving equipment, considering suppliers who factored environmental standards when designing their products, incorporating environmental standards into the system for evaluating suppliers, and purchase of eco-labelled products all of which were practiced to a moderately large extent.

Reverse logistics to be the second most adopted GSCM practice and was adopted to a moderately-large extent by these public institutions. Reverse logistics in the universities involved waste reduction, reuse and recycling, management of reverse flow of material and reusing whenever possible, and the return of used products and empty packaging materials to suppliers for recycling all of which were practiced to a moderately-large extent.

Green logistics was thirdly the ranked GSCM practice among public universities in Kenya and was moderately adopted. Green Logistics in public universities involve the use of vehicles that are powered by renewable energy to a moderately-large extent. To a moderate-extent, the universities formally employ freight-consolidation and route planning to minimize the number of trips and energy consumption, formally employ freight-consolidation in order to ship products in an efficient manner, and Collaborated with supply chain network partners and players like vendors, 3PL and 4PL service providers to come up with environmentally-friendly purchasing procedures and transportation means.

On the drivers of GSCM practice adoption among public universities in Kenya, social and environmental responsibility are the leading drivers of GSCM practices adoption followed by government regulations and economic benefits, competition and lastly customer pressure as the least driver of GSCM practices adoption among public universities in Kenya.

On the barriers of GSCM practices adoption, high initial cost of adoption was the leading barrier of GSCM practices adoption among public universities followed by lack of relevant knowledge and experience in GSCM implementation, failure of the government to support GSCM initiatives and lastly failure of the top management in the universities to embrace and support GSCM adoption.

5.3 Conclusion

The study concludes that GSCM practices have been adopted to a moderately-large extend with green procurement and reverse logistics being adopted to a moderately large extend and green logistics adopted to a moderate extend.

It is concluded that social pressure and cooperate responsibility is the leading driver of GSCM practices adoption driving GSCM adoption to a large extend. Other drivers that push universities to adopt GSCM practices include government regulations, competition, customer pressure and economic benefits.

As for the barriers of GSCM practices adoption, it is concluded that high initial cost of adoption of the leading barrier hindering the successful adoption of GSCM practice to a moderately large extent. Other barriers hindering GSCM practices adoption are relevant knowledge and experience in GSCM implementation, failure of the government to support GSCM initiatives and lastly failure of the top management.

5.4 Recommendations

Based on the finding that the universities have only embraced GSCM practices to a moderate extent, it is recommended that these institutions should fully embrace GSCM practices. More so, the focus should be on green logistics which is least adopted despite the potential environmental and financial benefits as supported by Sang (2022) and other reviewed literature. The full adoption of GSCM practices can help these institution deal with the ailing problem of inadequate funding through reduced costs achieved when items are recycled, reused or even reduced use of energy and water. The institutions will also benefit from increased compliance with environmental standards and requirements and consequently attract more self-sponsored students who can help raise the revenues required to effectively run these public institutions of higher learning.

It is also recommended that the Kenyan government should chip in and give incentives to the public universities so as to afford the high initial cost of GSCM adoption which is the leading barrier. The government has a vital role to play in supporting the adoption of GSCM practices especially in public institutions by providing adequate funds and supportive regulatory framework. By supporting GSCM adoption in the universities, the government will realize efficient utilization of public funds channeled to university education, it will be able to offer quality and affordable education to its citizens, and will make steps in realizing the climate action programs developed by the United Nations.

5.5 Limitations of the Study

The study's time constraint was one of its limitations that could not allow all respondents to respond. Financial resources to make follow up meetings and calls were also limited. However, the researcher made optimal use of available resources to follow up with

respondents and obtain adequate responses. Another limitation was unwillingness of respondents to reveal information due to confidentiality concerns but the researcher reassured the participants that the data gathered was to be handled with extreme discretion and with such assurance, an adequate response rate was attained.

5.6 Suggestions for Future Research

Future research in GSCM Practices should focus on other GSCM practices not considered such as green manufacturing, eco-design, and investment-recovery to find out their extent of adoption. By including more GSCM practices in future study, a true picture of the extent to which the public universities employ GSCM will be reflected and the barriers that face the implementation of all GSCM practices will be obtained.

Since this study was conducted in public universities, future research should also focus on private universities so as to understand how adoption of GSCM practices compare with public universities, and whether the drivers are different.

The research can also be replicated in a few years to determine whether the same factors influence adoption of GSCM practices in the universities and the extent-to-which they drive GSCM adoption as new universities are established.

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LIST OF APPENDICES

Appendix I: List of Public Universities in Kenya

Alupe University

Chuka University

Dedan Kimathi University of Technology

Egerton University

Garissa University

Jaramogi Oginga Odinga University of Science and Technology

Jomo Kenyatta University of Agriculture & Technology (JKUAT)

Kaimosi Friends University

Karatina University

Kenyatta University

Kibabii University

Kirinyaga University

Kisii University

Laikipia University

Machakos University

Maasai Mara University

Maseno University

Masinde Muliro University of Science and Technology

Meru University of Science and Technology

Moi University

Multi Media University

Murang'a University of Technology
Pwani University
Rongo University
South Eastern Kenya University
Taita Taveta University
Technical University of Mombasa
Technical University of Kenya
The Co-operative University of Kenya
Tharaka University
University of Eldoret
University of Embu
University of Kabianga
University of Nairobi
National Defense University

Source: Kenya Education Network (2023)

Appendix II: Research Questionnaire and Link to Online Questionnaire

Dear Correspondent, the aim of this questionnaire is to gather data on green supply chain management practices among public universities in Kenya. The data collected will be treated with high confidentiality and used only for academic purposes. A copy of the research findings will be forwarded to the university management upon request. As such, your input and participation is requested and will be highly appreciated.

SECTION A: GENERAL INFORMATION

Please tick appropriately.

1. What is your designation?

a) University Manager or the equivalent ( )

b) Procurement Manager ( )

c) Transport/logistics Manager ( )

d) Stores Manager ( )

2. What is your highest level of education?

a) Certificate ( )

b) Diploma ( )

c) Degree ( )

d) Post Graduate ( )

3. For how long has your university been in operation?

a) Less than 2 years ( )

b) 2-5 years ( )

c) 6-10 years ( )

d) 11 and above ( )

4. How long have you worked for your university?

a) Less than 2 years ( )

b) 2-5 years ( )

c) 6-10 years ( )

d) Over 10 years ( )

SECTION B: EXTENT OF GSCM ADOPTION

Please indicate the extent to which you agree with the following statements on the extent to which your organization has adopted the following green supply chain practices. Use the scale 1 to 5 where 5= to a very large extent 4= Large extent 3= moderate extent 2= small extent 1=very small extent.

S/No	**Reverse Logistics**	**1**	**2**	**3**	**4**	**5**
1	The university manages reverse flow of material					
2	Materials reuse whenever possible					
3	Waste reduction, reuse and recycling approaches					
4	The university returns used products and empty packaging materials to supplier for recycling					
	Green Procurement	**1**	**2**	**3**	**4**	**5**
1	The university purchases eco-labelled products					
2	Adoption of environmental criteria into the supplier assessment system					
3	Providing design specification to suppliers that include environmental requirements for purchased items					
4	Purchasing energy saving equipment					
5	Purchase products that are energy efficient or products which require less energy to manufacture					

6	Buying products for which the packaging material is bio-degradable or recyclable					
	Green Logistics	**1**	**2**	**3**	**4**	**5**
1	The firm has formally introduced freight consolidation aimed at transporting more goods efficiently					
2	The firm has formally introduced freight consolidation and route planning that minimize number of trips and energy consumption					
3	The firm utilized vehicles that are powered by renewable energy sources					
4	Collaborating with suppliers, vendors, third- and fourth-party logistics (3PL and 4PL) partners to develop environmentally-friendly procurement protocols and eco-friendly shipping options.					

SECTION C: DRIVERS OF GREEN SUPPLY CHAIN MANAGEMENT ADOPTION

Please tick appropriately how you rate the driver that influences green supply chain management practices adoption in the university with regards to the parameters listed. Use the scale 1 to 5 where 1= No extent 2= small extent 3= moderate extent 4= large extent 5=very large extent.

S/No	**Drivers**	**1**	**2**	**3**	**4**	**5**
1	Government Regulations					
2	Social and Environmental Responsibility					
3	Competition					
4	Customer Pressure					
5	Economic Benefits					

SECTION D: BARRIERS TO GREEN SUPPLY CHAIM MANAGEMENT PRACTICES ADOPTION

Please tick appropriately how you rate the barriers that deter green supply chain management practices adoption in the university with regards to the parameters listed. Use the scale 1 to 5 where 1= No extent 2= small extent 3= moderate extent 4= large extent 5=very large extent.

S/No	Drivers	1	2	3	4	5
1	Lack of management support					
2	Lack of relevant knowledge and experience					
3	High cost of Adoption					
4	Lack of government support					
5	Inadequate technology					

Thank you for your cooperation

Link to online questionnaire:

https://docs.google.com/forms/d/e/1FAIpQLSckUgmKk18evOozqpHmHyy6i-vulMVtmXDNn9eNfzQ16YU_Og/viewform?usp=sf_link