

**THE MODERATING EFFECT OF ORGANIZATION CULTURE ON THE
RELATIONSHIP BETWEEN GREEN SUPPLY CHAIN MANAGEMENT
STRATEGIES AND PERFORMANCE OF SUGAR COMPANIES
IN WESTERN KENYA**

**BY
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DECLARATION

Declaration by the Candidate

This research thesis is my original work and has not been presented to any other institution of learning for the award of an academic certificate.

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Declaration by the Supervisors

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DEDICATION

I dedicate this work to my dad CPA Mwalati Kalawanga and late mum Mrs. Jackline Nekesa for their inspiration, financial support, encouragement, understanding, and prayers towards the successful completion of this research proposal and my siblings Solomon, Peter, Caleb, Betty, Mercy, Salome, and George and to my friends Cynthia Jeptoo and Dorothy.

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ABSTRACT

Although the drive to enhance overall sustainability in organization performance has resulted in to focus on pollution prevention and minimization of environmental impacts at all stages of the product lifecycle from sourcing of raw materials, through manufacturing, transport, use, and disposal, this has not been embraced by all companies in the sugar industry in Kenya, while those that have embraced the Green Supply Chain Management Strategies are still under-utilizing them. Culture may have a big influence on the performance of all organizations worldwide. The key to good performance is a strong culture. The general objective of the study was to investigate the moderating effect of organization culture on green supply chain management strategies on the performance of sugar companies in western Kenya. The study was underpinned by three theories which were; Complexity Theory, Transaction Cost Theory, and Organization Culture Theory. The study adopted an explanatory and cross-sectional research design in studying the targeted population. The population under study comprised 10 sugar firms with 500 employees from procurement, production, and operation departments, and a final sample size of 272 employees was arrived at. The data was collected using questionnaires. The study's findings revealed that green procurement ($\beta= 0.264, \rho<0.05$), green manufacturing ($\beta= 0.182, \rho<0.05$), eco-design ($\beta= 0.295, \rho<0.05$), and green distribution ($\beta= 0.364, \rho<0.05$) had a positive and significant effect on the performance of sugar companies in western Kenya with an R squared of 0.549. This means that performance is explained by green supply chain management strategies by 54.9 percent. Further, the findings revealed that organization culture had an antagonizing moderation effect on the relationship between green procurement ($\beta= -0.292, \rho<0.05$), green manufacturing ($\beta= -0.227, \rho<0.05$), eco-design ($\beta= -0.285, \rho<0.05$), and green distribution ($\beta= -0.270, \rho<0.05$) on performance with an R square of 0.723. These findings highlight the important interconnection between green supply chain management strategies in explaining performance. In light of these findings, the study offered targeted recommendations for policy and practice. Managers should integrate green procurement practices by partnering with suppliers who prioritize environmental sustainability. Managers should also prioritize eco-design principles to minimize waste and promote product recyclability. Managers should foster a collaborative culture that encourages employee participation in sustainability initiatives, as this can enhance the overall effectiveness of GSCM strategies. Company managers should actively cultivate and promote an organizational culture that supports sustainability and green initiatives. The main limitation was that culture was studied at one point in time and it is evolutionary thus similar studies could employ longitudinal research designs that would unravel the causal dynamics underlying the relationships identified. Future studies could also consider other jurisdictions as well as other potential moderators. Main limitation was that culture was studied at one point in time and it is evolutionary thus similar study could employ longitudinal research designs that would unravel the causal dynamics underlying the relationships identified. Future studies could also consider other jurisdictions as well as other potential moderators.

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ABBREVIATIONS

AFA	Agriculture and Food Authority
AGOA	African Growth and Opportunity Act
COMESA	Common Market for Eastern and Southern Africa
EAC	East Africa Community
ECD	Environmentally Conscious Design
ERM	Environmental Responsibility Manufacturing
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
GM	Green Manufacturing
GP	Green Procurement
GSCM	Green Supply Chain Management
GSCP	Green Supply Chain Performance
HQE	High Quality Environmental
KSA	Kenya Sugar Authority
KSB	Kenya Sugar Board
LCA	Life Cycle Assessment
LEED	Leadership Energy and Environmentally Design
MT	Metric Ton
OECD	Organization for Economic Cooperation and Development
PWC	Price Waterhouse Coopers
SCM	Supply Chain Management

DEFINITION OF KEY TERMS

Eco-design– Eco-design, according to Johansson (2002), is the process of developing products to reduce the environmental impact they will have throughout their life cycle. This is done while maintaining all other fundamental manufacturing requirements, such as cost and performance.

Green distribution - Green distribution is defined by Rao & Holt (2005) and Sarkis (2009) as distribution practices and activities that have the least number of detrimental effects on the environment. It is assumed that the actions don't harm the environment. Green distribution includes green packaging, green marketing, green storage, and green transportation.

Green manufacturing- is the framework that combines concerns about manufacturing, organizing, and controlling products and their design to identify, assess, reaching, and handle the stream of environmental waste to reduce and limit the impact on the environment while also making an effort to uphold the standards of the product (Melnik et al., 2009).

Green procurement - is the purchasing practice that considers the environment, incorporating the reduction; reuse, and recycling of materials during buying products. During purchasing products that have a lower negative impact on the environment are considered. Zisis, (2003) states that environment factors should be considered during purchasing decisions based on price, performance, and quality.

Green supply chain management –Practices essential in ensuring that there is improvement in the environmental impact, through control of unfinished

products, and the processes from suppliers to manufactures to customers (Wang and Lin, 2011). It is best defined as merging environmental factors in product design, logistics, and manufacturing.

Organization culture- The unique social and psychological environment in an organization based on the existing values and behaviors within a given institution. It is made up of an organization's expectations, experiences, philosophy, and values that hold it together and is expressed in its self-image, inner workings, interactions with the outside world, and future expectations. It is always evident in an organization when individuals have shared attitudes, beliefs, customs, and written and unwritten rules that have been developed over time and are considered valid (Caddy & Helou, 2007).

Performance- Swansom (2000) argues that it is when a system is productive based on its delivery of goods and services, utilizing the existing resources within a firm in an efficient manner to ensure that the goals within the firm are achieved.

CHAPTER ONE

INTRODUCTION TO THE STUDY

1.1 Background of the Study

In today's globally competitive environment, evaluating performance is widely regarded as a crucial part of efficient planning, controlling, and decision-making (Ahi & Searcy, 2015 Naslund & Williamson (2010) proposed that in the competitive global environment, a firm's performance can no longer be determined solely by internal decisions and actions, but will instead depend on the implementation of decisions and actions made throughout its entire supply chain.

A company's performance is determined by how well it complies with regulations, maximizes production and minimizes waste (Mutingi, Mapfaira, & Monageng, 2014). An assessment of a company's performance can be made by examining how efficiently the entire production process operates. One sign that a company is performing well is a rise in output. These can be achieved through increased and more productive production, giving the industry a competitive edge. Increased and superior quality of the final products is another indicator of operational performance. Metrics of operational performance are employed to evaluate the organizational growth of a good or service from start to finish (Mun & Jang, 2018).

Sugar ranks among the most widely consumed, traded, sensitive and protected commodities on globally and regionally (Bouët et al., 2022). Recent developments in the sugar industry, inclusive of price distortions in the global sugar market, liberalization of the European sugar sector and the globalization of international agricultural trade, have amplified the need to comprehend evolution of competitiveness in African sugar exports (Joshua & Lubos, 2023). Globally sugarcane accounts for an

estimated 80% of total sugar production (Smutka et al., 2011; Macháček et al., 2017) of which 70% is consumed domestically while 30% is traded on the international market (Pulkrabek et al., 2011; Taylor, 2017). The emergence of Brazil as a major sugar producing country and its trade-off between raw sugar production and biofuels has had ramifications on the global sugar supply and prices (FAO, 2005; Helia, 2022)

The trade and competitiveness of sugar in Africa is likely to continue to evolve in the coming years. The demand for sugar is anticipated to rise as a result of the continent's expanding population and rising incomes. While this might result in higher sugar imports, it might also give African nations the chance to grow their own sugar industries and boost their competitiveness on the world market (Helia, 2022). Das Nair et al. (2017) found that not only do some African countries, particularly South Africa and Zambia, have comparative advantage in sugar production; the countries in question also have competitive advantage in sugar trade on the international market. Recently, Seleka and Dlamini (2020) conducted a comprehensive analysis of ACP sugar exporters which included 11 African countries. The study found out that countries like Côte d'Ivoire, Kenya, Madagascar, Malawi, Tanzania, Uganda, and Zambia have marginally moved from a state of extreme comparative disadvantage between the early 1960s and 1970s to comparative advantage in the 2010s.

A significant employer and contributor to the national economy in Kenya is the sugarcane sector. It is among the most significant crops, along with maize, horticulture, coffee, and tea. Presently, the sector provides direct assistance to about 250,000 small-scale farmers, who produce more than 92% of the cane that the sugar businesses process (KSB 2013). Six million Kenyans are thought to be employed in the sector, either directly or indirectly (William M. Wakhisi, 2021). Kenya's sugarcane production has

decreased as a result of various issues. Low sugar productivity on farms is caused by long-maturing varieties inferior seeds, smut disease, high input prices, and late farmer payments (Mati & Thomas, 2019). Kenya produces less sugar than it takes in; as of right now, almost 300,000 metric tons more are used than are produced (CODE, 2017). The amount of milled sugar produced has decreased recently, from roughly 635,700 tons in 2015 to 491,100 tons in 2018. In the meantime, imports of sugar have been rising. The nation is a net importer of sugar because the yearly domestic demand is over 900,000 tons (Mati & Thomas, 2019; OECD/FAO, 2019). FAS/Nairobi predicts sluggish sugar production in MY 2019/2020 as a result of the state-owned mills' delayed privatization, a move that was supposed to boost the industry (USDA, 2019). The mills have not been able to meet their cane requirements for the past 20 years because cane availability has not regularly matched manufacturing capacity. The cane requirement will be 9.84 million MT at an average factory efficiency level of 80%, translating to 1.09 million MT of sugar output per year (SISTR, 2019, Mati & Thomas, 2019; KNBS, 2018).

Compared to the international market price of US \$280 per ton, Kenya's average ex-factory price for sugar is approximately US\$800 per ton. This indicates that sugar is overpriced for Kenyan consumers. About 56 businesses are registered as sugar importers, according to the Agriculture and Food Authority. Therefore, total importers exceed the total number of sugar factories in Kenya. Tariffs and quotas imposed on Kenya's imports of raw sugar frequently cause domestic sugar prices to rise, driving up the cost of sugar (Mati & Thomas, 2019).

According to the Institute of Economic Affairs (2016), the industry faces ongoing challenges that could lead to its collapse, such as insufficient raw material availability,

outdated and inefficient machinery resulting in low processing efficiency, high production costs, and incapacity to compete with imported sugar. According to recent estimates, Kenya's cost of producing sugar is USD 870 per MT, which is twice as expensive as other COMESA rival nations.

According to the Kenya National Assembly (2015), this is significantly higher than the values for Zimbabwe (USD 300), Malawi (USD 350), Swaziland (USD 340), Sudan (USD 340), and Zambia (USD 400). As a result, Kenyan companies that produce sugar lack a competitive edge in global and regional markets such as COMESA.

Inefficiencies in the sugar factories have been caused by poor management. Due to massive debt, the majority of state-owned sugar mills are running below capacity. They frequently experience machinery malfunctions due to inadequate maintenance and inefficiency. Even with the majority of the sugar factories—like Mumias—being privatized, the government still incurs losses. The cost of production in Zambia is reportedly 50% more than in Tanzania and Uganda, and 60% higher than in Uganda, meaning that locally produced sugar is still not competitive.

Although some factors have been cited as affecting performance, green supply chain management is an emerging issue. Carter (2009), argues that large firms have chosen to use the assured supply chain sustainability strategy because it is consistent with the performance outcomes they expect. Despite this setup, maintainable supply chain methods' performance results remain a mystery. Furthermore, performance assessment in sustainable supply chains is still in its relatively early stages of development.

The sugar business and associated sugar-bioproduct industries are currently dealing with challenging sustainability concerns, much like many other food and chemical industries (Eggleston & Lima, 2015). Sugar processing activities generate large

amounts of organic solid waste and by-products, such as leaves from cane or beetroot, molasses from the final crystallization, press mud or cachaza, bagasse fiber from the cane, mud, and soil arriving at the plant with the raw material and lime solids from the juice clarification, according to the World Bank's Final Report on Sugar Sustainable Supply Chain, 2017 (World Bank, 2017). While satisfying the high demands of a growing population, the sugar milling industry and related sectors are striving for environmentally acceptable and commercially successful manufacture within a strict regulatory framework (Eggleston & Lima, 2015).

Businesses must decide how to address supply chain manufacturing processes as consumer knowledge of environmental issues, such as heating, and the effects of the commodities they manufacture continue to grow in the business sector. (Martin, 2017). Businesses have been contributing more to greenhouse gas emissions and environmental damage; thus, it is now necessary for those very companies to adjust their supply chain procedures to account for the limited resources.

A strategy for expediting and developing processes as well as producing with a key specialty in the needs of environmental legislation is the adoption of Green Supply Chain Management (GSCM) (Hsu & Hu 2008). Management must implement decisions that support the integration and synchronization of environmental practices throughout the inventory/supply chain in response to consumer demands for products and services that do not negatively impact the environment (Vachon & Klassen, 2007). Green supply chain management methods are defined by Wang and Lin (2011) as reducing the impact on the environment through the control of procedures, spare parts, and unfinished goods as they move from suppliers to manufacturers to customers.

The goal of supply chain management (GSCM) is to eliminate or reduce waste (energy, emissions, and chemical/hazardous, solid wastes) (Hervani, Helms & Sarkis, 2005). By lowering environmental risk and impact, green supply chain management, has become a critical new strategy for businesses to achieve their goals of profit, efficiency, and market share (Hu &Hsu, 2010).

Ensuring that businesses consider environmental issues as they advance their supply chains is the primary goal of GSCM. The goal of this environmental consciousness is to remove environmentally hazardous processes from the supply chain, improving the businesses' environmental efficacy and reducing their environmental risks while also contributing to a rise in their profitability and market share.

To improve environmental sustainability, green supply chains are integrating eco-friendly concepts into supply chain management. These practices include green purchasing, green distribution, and warehousing, green transportation using biofuels, green manufacturing processes, and ultimately, green product end-of-life management.

In Kenya, a range of economic sectors have used green supply chain methods to adhere to environmental legislation and to solve concerns related to performance and the environment (Ondiso, 2012; Jones, 2006). Businesses in the agriculture industry have embraced eco-friendly irrigation techniques, afforestation, uncontaminated seedlings, and insecticides.

Nonetheless, the adoption of Kenya's 2010 Constitution signaled the start of a significant new phase in the country's environmental policy formation. Praised as a "green" constitution, it has complex clauses that have a significant impact on sustainable development (RoK, 2010). These include the Bill of Rights guarantee of a clean and healthy environment. The land and the environment are the sole subjects of

Chapter V of the constitution. It also encompasses a wide range of environmental social, political, and economic rights, including the rights to food, housing, and clean water (RoK, 2010).

Globalization and localization both require businesses to enhance their environmental performance (Sarkis & Tamarkin, 2005). Consequently, companies allocate significant funds to environmental projects, and some studies indicate that supply chain management techniques that prioritize environmental sustainability (also known as "Green Supply Chain") influence companies' overall success. Businesses that implement these strategies may be able to increase productivity through waste management, reputation management, and cost reduction (Hoffman 2000; Klassen & Johnson 2004; Handfield et al. 2005; Vachon & Klassen 2008; Zhu et al. 2008). To achieve organizational success, some businesses have implemented Green Supply Chain Management (GSCM) strategies (Zhu & Sarkis, 2006).

Based on circumstantial evidence, businesses have implemented GSCM strategies globally to boost productivity. To improve company performance, Xerox, Kodak and 3M, have all incorporated elements of green management techniques into their supply chains (Klassen & Johnson, 2004). The relationship between green supply chain management and business performance has been the subject of numerous researches; however, the role that organizational culture plays in mitigating the effect of green supply chain management on performance is not well understood.

The idea that specific organizational cultures lead to effective organizational performance is a primary driver of interest in organizational culture. An organization can have a significant economic benefit from an appropriate culture (Serfonten, 2010). Alternatively, organizational culture can provide a company with a competitive edge

since it shapes the way the company does business and helps manage employee behavior (Gupta & Govindarajan, 2000). Frequently, the most influential elements are imperceptible and challenging to notice unless they are a part of the system.

Globally, cultures may have a significant impact on how well organizations succeed. This is a practice that should not be taken for granted because it affects performance in both positive and negative ways. Strong cultures are essential for good performance (Kandula , 2006). Culture is considered as a complicated phenomenon (Dubkevics & Barbers, 2010) and can take very broad, wide, and multi-aspect dimensions, according to Kataria, et al., (2015). An organization's shared assumptions, values, and beliefs might be considered as its culture. Culture needs to be ingrained in the thoughts of all employees inside an organization (Hofstede, 1998).

When Cranes and Harris (2002) examined whether green institutional ideologies existed in businesses, they found that subcultures could impede the development of a green culture that permeates the entire organization. The case study of Grenville (2006) concluded that an organization's culture and the presence of subcultures determine the ecological issues it chooses to address. According to Linnenlueckes, et al., (2009), employee comprehension of sustainability within a company can be impacted by subcultures inside that company.

Employee behavior is often influenced by the culture of the organization in which they work. Furthermore, some management academics have asserted that a proper and robust organizational culture is necessary for an organization to be strategically fit (Storey & Hughes, 2013; Chuang & Morgan, 2012). Employee behaviors, attitudes, organizational activities, and most importantly organizational performance are all impacted by organizational culture.

1.1.1 Sugar industry in Kenya

Kenya has a sizable manufacturing industry that supplies the domestic market as well as exports goods throughout East Africa. Kenya's manufacturing industry has been designated as one of the most productive areas for economic growth and development due to its enormous potential to generate income, create jobs, and reduce poverty. The industry contributes to the GDP and is dominated by subsidiaries of multinational firms (PWC, 2006). To capitalize on expanded market outlets through AGOA, COMESA, and East African Community (EAC) arrangements, sugar sector is also characterized by the improved power supply, increased supply of agricultural products for agro-processing, favorable tax reforms and tax incentives, more vigorous export promotion, and liberal trade incentives (PWC, 2006).

At least 25% of Kenyans make their living from agricultural sector, which is the backbone of the country's economy and is greatly aided by the sugar business. About 15% of the agricultural GDP comes from this subsector, which employs the majority of people and is their primary source of income in Western Kenya, which includes the provinces of Nyanza, the Rift Valley, and the Western Area. Working at 56% of installed capacity, the sector produced over 520,000 tons of sugar in 2008–2009. In such an environment, the sector will need to lower production costs by at least 39% and improve its competitiveness throughout the entire value chain to catch up to COMESA sugar-producing nations and EAC partner states (Kenya Sugar sector Strategic Plan, 2010-2014). Before Kenya's independence, the private sector controlled the country's sugar industry.

In 1973, the Kenya Sugar Authority (KSA) was founded by the government. While domestic sugar consumption was 253,000 tons, local sugar production reached 296,000

tons by 1976. This trend, though, was fleeting, as Kenya quickly turned into a net importer of sugar. For example, domestic sugar consumption climbed from 324,054 tons to 669,914 tons between 1981 and 2004, while overall sugar output increased from 368,970 tons to 517,000 tons during that same period.

Using cost-cutting measures, tightened regulations, and increased industrial competitiveness, the Kenyan government is reviving the country's multifunctional, diversified, and globally competitive sugar cane sector.

Upon founding of the Miwani Sugar Company in 1922 and the addition of the Ramisi Sugar Company in 1927, large-scale production and processing got underway. Following Kenya's independence, the government began to assume a leading part in the ownership and administration of the sugar business. The factories like Muhoroni (1966), Chemelil (1968), Mumias (1973), Nzoia (1978), and South Nyanza (1979) were all established by the government. Sugar factories like West Kenya (1981), Soin (2006), Kibos (2007), Butali (2011), Transmara (2011), and Sukari (2012) have also been constructed by private investors. Kwale International Sugar Company Limited, a private company based in Ramisi, is the most recent addition to the sugar sector. It began grinding cane in 2014.

1.2 Statement of the Problem

The Kenyan sugar sector has not performed as well as anticipated when compared to other regions of Africa and the world (AFA 2019). Records from KSD (2018) show that the performance of the companies that produce sugar has been declining over the last three years. The total amount of sugar produced in Kenya decreased by 41% from 638,340 tons in 2015 to 377,126 tons in 2017, despite an increase in local demand of up to 890,000 tons recorded in 2017.

There are two main issues facing Kenya's sugar sector. First off, the nation produces low-quality milled sugar from mills and low-quality cane from farms. The average yields across the country are lower than those of other countries in the region that produce sugar. Secondly, in Eastern and Southern Africa (COMESA) region, Kenya has the highest sugar price. According to the Institute of Economic Affairs (2016), the cost of producing one tone of sugar in Kenya is expected to be as high as US\$600, which is roughly twice as much as the cost in many of the neighboring countries, where it is between US\$250 and US\$350.

These businesses haven't done anything to utilize GSCMS. By lowering environmental risk and impact, green supply chain management, or GSCM, has become a critical new strategy for businesses to achieve their goals of profit, efficiency, and market share (Hu & Hsu, 2010). While some companies in Kenya's sugar industry have adopted green supply chain management strategies, those who have not are still underutilizing them. This is despite the drive to reinforce overall sustainability in organization performance, which has led to a focus on pollution prevention and minimization of environmental impacts in the least stages of the product lifecycle from sourcing raw materials through manufacturing, transport, use, and disposal (Chandrakar, 2012).

Some sugar enterprises, like Mumias Sugar Company, have closed as a result of the fierce rivalry that exists today when resources are few and operational risks and unpredictability are prevalent. The stakeholders in the sugar industry (sugar mills, farmers, and researchers) are not giving enough thought to adapting to global climate change and climate variability, which should be crucial in cost reduction, even though high input costs resulting from inadequate infrastructure have led to high prices of

locally manufactured goods, limiting their competitiveness within the regional markets and impeding the sector's capacity utilization (Malaba, Ogolla & Mburu, 2014).

The idea that specific organizational cultures lead to effective organizational performance is a primary driver of interest in organizational culture. An organization can benefit significantly economically from an appropriate culture (Serfonten, 2010). Put another way, organizational culture can provide a company with a competitive edge since it shapes the way the company does business and helps manage employee behavior (Gupta & Govindarajan, 2000). Frequently, the most influential elements are imperceptible and challenging to notice unless they are a part of the system.

The main goal of the research was to investigate how organizational culture influences the relationship between the performances of sugar companies in western Kenya that use green supply chain management strategies and their inbound and outbound logistics operations, which have the potential to pollute the environment.

1.3 Research objectives

Both general and specific objectives guided the study;

1.3.1 General objective

The purpose of this study was to test the moderating effect of organizational culture on the relationship between green supply chain management practices and the performance of sugar companies in western Kenya.

1.3.2 Specific objectives

- i. To determine the effect of green procurement on the performance of sugar companies in western Kenya.

- ii. To establish the effect of green manufacturing on the performance of sugar companies in western Kenya.
- iii. To examine the effect of eco-design on the performance of sugar companies in western Kenya.
- iv. To determine the effect of green distribution on the performance of sugar companies in western Kenya.
- v. To establish the moderating role of organization culture on the relationship between:
 - a) Green procurement and performance among sugar companies in western Kenya.
 - b) Green manufacturing and performance among sugar companies in western Kenya.
 - c) Eco-design and performance among sugar companies in western Kenya.
 - d) Green distribution and performance among sugar companies in western Kenya.

1.4 Hypotheses

H₀₁: Green procurement has no significant effect on the performance of sugar companies in western Kenya.

H₀₂: Green manufacturing has no significant effect on the performance of sugar companies in western Kenya.

H₀₃: Eco-Design has no significant effect on the performance of sugar companies in western Kenya.

H₀₄: Green distribution has no significant effect on the performance of sugar companies in western Kenya.

H₀₅: Organizational culture has no significant moderating effect on the relationship between:

- a) Green procurement and performance of sugar companies in western Kenya
- b) Green manufacturing and performance of sugar companies in western Kenya.
- c) Eco-design and performance of sugar companies in western Kenya.
- d) Green distribution and performance of sugar companies in western Kenya.

1.5 Significance of the study

Today's firms are operating in such a dynamic and competitive business environment meaning that they relentlessly have to think of new ways of improving their business to provide better value to the customers. It is no coincidence that green supply chain management has been selected as a topic for this study.

To the academicians and researchers

The study will add more knowledge to the field of supply chain management and therefore scholars will benefit from this. This study will also impart more knowledge to the researcher in the field of green supply chain management and will also provide information to future researchers in the same area.

Government and other stakeholders

The findings will be useful to the government and other stakeholders such as suppliers by providing insight on green supply chain management components applicable in sugar manufacturing firms and therefore provide machinery to motivate the firms in their implementation as well as help in addressing the challenges to ensure effective green supply chain management implementation.

Policy makers

Policy makers will benefit greatly from this study's informational findings, which will enable them to determine which green supply chain management techniques are essential for improving supply chain performance.

Managers

In addition to identifying the main arguments for why companies in this industry should now incorporate the green supply chain management philosophy as a tactic to improve firm performance, this study will assist managers in their role as decision-makers in improving other management practices in the sugar manufacturing sector.

1.6 Scope of the study

This study focused on the extent of the effect of green supply chain management practices on performance among the sugar firms in western Kenya with organization culture as the moderator. There are 10 sugar companies in Western Kenya that are west Kenya Sugar Company, Butali Mills Factory, Chemilil Sugar Company, Muhoroni Sugar Company, Nzoia Sugar Company, south Nyanza Sugar Company, Kibos Sugar Company, Sony Sugar Company, Sukari Industries Limited, Busia Sugar company. It covered a period between May 2022 and august 2022. The study employed an explanatory research design to conduct the research.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviewed literature on green supply chain strategies, organizational culture, and performance. This chapter further reviewed related theories, the conceptual framework, Empirical literature, critiques of the existing literature, a summary of the literature, and the research gap.

2.2 Concept of performance

In management, performance evaluation is almost always crucial, particularly in fiercely competitive, dynamic, complicated, and international settings where managers must be well-versed in a wide range of topics (Fleisher, 2003). This is especially true when it comes to making sure that businesses successfully develop, apply, and modify their organizational strategy. The strategy of an organization serves as the ship's rudder (Ross, 2003). By regularly assessing the strategy's efficacy in the face of erratic external factors, the performance assessment system serves as the strategy's glue. The basic tenet of Kaplan and Norton's (2001) approach to building a strategy-focused company is "Measure the Strategy."

Obado (2005) noted the competitive tactics used by Kenyan sugar production companies. He was able to prove that sugar companies used competitive tactics to take up space in the market. He said that sugar companies focused heavily on distribution, branding, and customer service while using leadership and differentiation tactics. According to Openda (2013), the quantifiable part of an organization's process is its firm performance. It primarily includes on-time delivery, production cycle time,

productivity, inventory management, cost of quality and scrap minimization, and production dependability and defect rates.

However, as Sarkis et al. (2011) point out, strong legal and regulatory forces in industrialized nations like the USA enhanced public awareness and consequently influenced environmental management methods. Big, successful companies in the industry occasionally come under heavy fire from rivals and outside environmental activists (Zhu and Sarkis, 2007). Because of this, many organizations operate in a setting where pressure from rivals forces them to take experienced actions to fight rivalry and obtain a competitive edge (Canning and Hammer–Lloyd, 2001).

2.3 Concept of Green supply chain management practices

The green supply chain management concept is bred by incorporating environmental thought into the planning and coordinating of business activities to produce a fit that delivers value to clients (Lambert & Cooper 2000; Council of Supply Chain Management Professionals, 2009).

Due to increased product complexity, quick technological advancements, and fiercer competition, firms' continuous supply chain strategies need to be improved in the age of globalization. The Green Supply Chain Management (GSCM) is an application that has been developed to address this need. It involves reorganizing and improving traditional supply chain management by integrating eco-friendly practices into its chain's links.

Scholarly literature encompasses a vast array of research on GSCM, leading to a multiplicity of interpretations. GSCM refers to reassessment of supply chain management and industrial procurement technologies from an environmental standpoint, (Zhu, Q., & Geng, Y. (2020). "Drivers and barriers of GSCM. GSCM

involves recycling, reusing, and substituting resources in place of acquisition activities (Seuring & Müller, 2021). The tracking and enhancement of an organization's environmental performance is known as GSCM. Srivastava (2007) defines GSCM as the process of integrating specific supply chain transactions, like waste management, raw material selection, product design, and delivery, with environmental considerations. There are many definitions of the term in the literature and almost all studies concur that the term refers to the integration of environmental consciousness and efficient supply chain management.

Ensuring that businesses consider environmental issues as they advance in their supply chains is the primary aim of GSCM. The goal of this environmental consciousness is to remove environmentally hazardous processes from the supply chain, improving the businesses' environmental efficacy and reducing their environmental risks while also contributing to a rise in their market share and profitability. Pollution, overpopulation of landfills, and declining supply of raw materials are the main causes of GSCM's growing significance.

Green supply chain management, (Zsidisin and Sifer (2001), refers to the creation of supply chain management guidelines that take the environment into account when designing, distributing, using, recycling, and disposing of business goods and services. According to Kumar, V., & Singh, R. K. (2021), a "green supply chain" is made up of practices including resource conservation, product reduction, recycling, green design and re-use that aim to lessen environmental harm produced over a product's whole lifecycle. According to Hervaniet al. (2005), green supply chain management consists of the following elements: green distribution/marketing, green production/materials management, reverse logistics and green purchasing.

Three dimensions of green supply chain management (GSCM) were examined by Rao and Holt (2005): the inbound function dimension, which included green purchasing activities; the outbound function dimension, which included green marketing; the environmentally friendly packaging; the environmentally friendly distribution; and the recycling activities. Shang et al. (2010) carried out another study that used many dimensions to investigate GSCM. Six categories were created by the authors to group green practices. The first is the aspect of green production and packing, which covers using recyclable and reusable packaging, choosing clean transportation options, and reducing waste and hazardous material usage. The establishment of an environmental management system and the provision of environmental training programs for staff members comprise the second pillar, which is environmental involvement. "Green marketing," is the third dimension and it entails environmental sponsorship initiatives, environmental labeling, and posting information about environmental issues on the business website. "Green supplier," is the fourth dimension which includes actions like choosing the supplier according to environmental standards and working with the supplier on environmental concerns. Green stock, the fifth dimension, has to do with selling extra, used materials and scrap. The final dimension, known as "green design," deals with designing products that use less energy and materials (Shang, Lu, & Li, 2010).

Among the first studies to address green supply chain management strategies from multiple angles were Zhu and Sarkis's (2004) investigation. The authors examined green supply chain management concerning four dimensions: investment recovery and eco-design, external practices, internal environmental management, and factor analysis.

Within a single category known as external practices, the authors assessed consumer cooperation in green purchasing and environmental issues. In subsequent research, the authors explored GSCM from five angles, and within this framework, green buying and consumer collaboration on environmental issues were investigated from several angles (Zhu & Sarkis, 2006; Zhu, Sarkis, & Lai, 2007; Zhu, Sarkis, & Lai, 2008b).

2.3.1 Green procurement

The term "green procurement" (GP) refers to the process of taking the environment into account while making purchases by reducing, reusing, and recycling resources. In certain industries, green procurement serves as a response to financial and environmental concerns. It also refers to a method of obtaining goods and supplies with minimal environmental influence (Salam, 2008). Green Procurement is the process of predicting waste and contamination by taking the environment into account while making purchasing decisions, Holbrook (2004). This includes taking value, execution, and other factors into account.

The purpose of green procurement is to promote asset reuse, (Foo et al., 2019). Purchasing department should actively engage in all supply chain network activities and purchase more reusable materials to minimize the number of raw materials used, to an extent that is reasonably possible. According to Zsidisin and Siferd (2001), green procurement refers to a set of guidelines and tactics that take the environment's impact into account.

Green procurement, according to Zhu et al. (2002) is an office within the organization that advises basic leadership to boost business growth and efficiency through the reduction of materials and end-of-life cycle costs, assets assurance, and the upgrading of the business's social face. The purpose of green procurement is waste management,

and majority of procurement offices will always take into account any incentive that would reduce the overall expenditures incurred during the time spent disposing of trash (Martha & Houston 2010).

Green procurement refers to selection of goods and practices that minimize environmental impact, whereby organizations are obligated to assess the natural consequences of an item's end of lifecycle. Favorable Procurement is another name for green procurement. This is referred to as buying goods and services that are beneficial to the environment. When used in comparison to their standard or usual counterpart, goods and services should always have a minimal negative impact on the environment (Mulwa, 2010).

2.3.2 Green manufacturing

Using the best resources is a key component of green manufacturing, which can eventually give businesses a competitive edge by producing high-quality goods at the lowest feasible cost.

Identifying, assessing, reaching, and managing the stream of environmental waste to reduce and limit environmental effects while also attempting to maintain the standards of the product is a framework known as "Green Manufacturing". (GM) integrates product design and manufacturing issues (Melnik et al., 2009). As a result, raw materials that require systems with limited access have been used (Ninlawan et al., 2010). One of the green manufacturing processes is eco-advancement and green innovation. It is the force behind the transformation to a low-carbon and green economy. According to Defra (2008), most organizations consider the application of green manufacturing technology as the cornerstone of their economic development and progress.

2.3.3 Eco-Design

These are activities that try to reduce a product's environmental impact over its complete life cycle. They are included in eco-design, also known as green design or environmental design (Beamon (1999), Sarkis, (1998), Govindan et al., 2015). According to Rostamzadeh et al. (2015), this process starts with the provision of resources, goes through production, and concludes with the product's disposal after its life cycle is complete. According to Johansson (2002), eco-design refers to the measures implemented in the early phases of product development to reduce the environmental impact that the product has across its life cycle, all while maintaining core manufacturing standards like cost and performance.

By taking into account the entire supply chain, eco-design integrates the design process with all other environmental aspects. This is significant because, according to Eltayeb et al. (2011), many environmentally harmful practices have their roots in the design phase. Techniques that apply to eco-design endeavors (Eltayeb et al., 2011): Reuse-friendly design makes it easier to use components or the entire product with the least amount of effort (Sarkis, 1998), Recycling-friendly design makes it easier to reprocess materials, disassemble parts based on materials, and disassemble waste goods (Lin, Jones, & Hsieh, 2001). According to Johnson and Smith (2022), design for manufacturing is the process of creating products to recycle them and make renewal and repair easier. Design for resource efficiency involves minimizing the number of materials and energy consumed during use, as well as promoting the use of renewable resources and energy. Zsidisin et al. (2011) define design for manufacturing as the process of reducing harmful materials used in product components and production process.

Buyukozkan and Cifci (2012) stated the significance of eco-design by revealing that approximately 80% of product-related environmental outcomes can be influenced throughout the design process. Packaging-related design and Product-related design are the two main areas into which eco-design techniques are divided. With regard to product design, Min and Galle (2001) proposed that procuring organizations should actively look for chances to employ recycled and reused components because these opportunities are important at the beginning of the supply chain.

Concerning packaging-related eco-design, Zhu et al. (2005) discussion of GSCM practices recommended that businesses work with their suppliers to make sure that they employ green packaging for their goods. Reusable and recyclable packaging is one of the components of green packaging, according to other studies (Thompson, G., & Lee, M. (2021), (Large and Thomsen, 2011), along with reducing waste by minimizing packing (Walker et al., 2008) and avoiding harmful materials (Buyukozkan and Cifci, 2012).

2.3.4 Green distribution

Green distribution, packaging, and manufacturing all comprise a green distribution method. Size, form, and the way the materials employed in the process impact distribution are all complemented by the packaging. Better storage solutions and packing can reduce usage, improve store space, and reduce handling problems by using more containers for transit. Green plan, which uses Life Cycle Assessment (LCA) and Environmentally Conscious Design (ECD) to create how to form choices that affect the item within the environment and cut on reduction of waste, is one of the Green Distribution Practices (Sarkis and Cordeiro, 2001).

2.4 Concept of organizational culture

Organizational culture is defined, in numerous various ways in the literature. Maybe the most commonly known definition is “the way we do things around here” (Roberts & Smith (2022)). In this research, organizational culture refers to the deeply seated beliefs and values shared by personnel in an organization.

Internal integration and coordination are the two main ways that organizational culture functions (Martins & Terblanche, 2003)). Internal integration can be defined as the on boarding of new employees, establishing the boundaries of the organization, fostering a sense of identity among staff members, and demonstrating dedication to the organization, according to an assessment of the literature on functions of organizational culture.

According to Martins (2000), the coordinating function involves developing a competitive advantage, understanding the surroundings in regards to appropriate behavior, and maintaining the stability of the social system which serves as the organizational glue. Mutual understanding and communication are based on a shared set of meanings provided by organizational culture. An organization's effectiveness may be greatly diminished by its organizational culture if it fails to do these tasks in a way that is satisfying (Martins & Terblanche, 2003). The spaces between what is publicly proclaimed and what occurs are filled by organizational culture. The strategy is maintained on course by the direction indication (Martins, 2000).

2.5 Theoretical review

A theory consists of a body of prepositions that are logically connected and empirically verifiable, with a basis consisting of a set of fundamental assumptions and axioms. According to Camp (2001), theoretical frameworks provide explanations for the

occurrences. The theoretical framework gives the research a distinct perspective on the world (Marriam, 2001). Three theories served as the foundation for the investigation:

2.5.1 Complexity Theory

Diversity in external elements, including consumers, suppliers, technology breakthroughs and government regulations, can be used to characterize complexity within an organizational context (Koufteros et al., 2007). Businesses find it difficult to anticipate and plan their organizational actions—like the deployment of the GSCM—when complexity rises. According to this idea, businesses function in a system that combines order and chaos (Prigogine, 1984), with the way the various actors interact determining the system's performance results. To adjust to the system, firms must be aware of and flexible to the co evolution and associations in their surroundings (Liu et al., 2022).

Many different parties are involved in the system when GSCM is implemented. This state of affairs is especially clear when it comes to external GSCM practices on tasks like giving suppliers environmental requirements-based design specifications, auditing suppliers, collaborating with customers on eco-design, and managing customer returns of products. The complexity of more general organizational complications like scale and relationships, or more focused operations like quality checking, recycling, remanufacturing, product return and inspection might exacerbate the challenges in implementing GSCM (Vachon and Klassen, 2006b). Prior research has acknowledged the difficulties involved in completing the loop for a supply chain (Guide and Wassenhove, 2009; Matos and Hall, 2007). Performance outcome of a Green Supply Chain Management (GSCM) activity cannot be reliably anticipated without knowledge of the actual contributions made by other participating parties in the system, due to the

constrained rationality of individual parties. If the broad economic, regulatory, environmental, social, and political elements are taken into account with a greater number of parties engaging with others, the complexity of implementing GSCM will increase (Bai and Sarkis, 2010a).

It gets more challenging to estimate the interaction outcomes and infer the behaviors of a complex system as it grows with more interacting parties or systems. Choi and Krause (2006) identified supply base complexity, which is conceptualized in three dimensions: first, the number of suppliers in the supply base, second, the degree of differentiation among these suppliers, and third, the degree of inter-relationships among the suppliers, as the main area of managerial consideration for managing a supplier system. They define complexity as the variety and interactions among the constituents of a system (such as suppliers in a base). It is possible to better manage issues with transaction costs, supply risk, supplier responsiveness, and supplier innovation in a supply base by having a thorough grasp of the complexity of the system (Choi and Krause, 2006).

Complexity theory suggests that certain operations in general supply chain management (GSCM), such as consumer cooperation for product returns, involve a dynamic network of links inside the system. Product innovation and system quality will also be determined by the buyer integration in product development (e.g., for an eco-design in GSCM, Vachon and Klassen, 2006b); (Koufteros et al., 2007). The exchange of information and the production of meaning are made possible by the interactions between the parties concerned (Yang, 2010). By doing this, it will direct the system's operation and assist in lowering the risks resulting from putting the GSCM activities into practice. The complexity of larger organizational complications, such as scale and

relationships, can make GSCM implementation more challenging (Vachon and Klassen, 2006b).

2.5.2 Transaction cost Economics Theory

According to transaction cost theory (Ketokivi & Mahoney (2020), the best organizational design minimizes trade costs to achieve economic efficiency. According to the notion, coordination costs for organizing, regulating, and overseeing transactions are generated by every kind of transaction. The theory examines money, time, and effort required for two parties to carry out an economic exchange or transaction, taking into account costs associated with searching, negotiating, distribution and control (Mutisya & Kinoti, 2017). The costs associated with conducting a search and gathering information pertain to the expenses incurred in determining the availability and pricing of necessary goods and services in the market. Conversely, the costs associated with coming to a mutually acceptable agreement between the buyer and seller, including contract draughting fees, is included in the bargaining costs. Lastly, the expenses associated with policing and enforcing the terms of the contract are incurred to make sure that both parties follow them (Driscoll, Halliday, & Stock, 2010).

Aspects of risk, asset specificity and transaction frequency are all present in transactions in general. According to Zsidisin and Siferd (2001), asset specificity encompasses physical asset, human resource specificity and site. The way both parties to a transaction react to different actions will depend on certain characteristics of the transaction.

Transaction costs are expenses incurred by a business as an outcome of its market operations. These expenses can include commissions, taxes that the business must pay to produce a good or provide a service to third parties and fees or they can be internal

expenses like cost of packaging, transportation, warehousing, etc. (Yousuf 2017, Katarzyna 2014, Clem 2004).

Businesses need to weigh the costs of their internal and external transactions to determine which will improve earnings the most (Yousuf 2017, Katarzyna 2014, Rodrigo, Fernando, André, Ferreira & Li, 2010). For companies to increase earnings and gain a competitive edge, their distribution expenses must be minimized. A profit is the remaining amount of money that a business has after paying all costs directly associated with earning that money, such as manufacturing a product, and other costs associated with carrying out its operations (Grimsley, 2015, Katarzyna 2014, Clem 2004). Green Distribution, Distribution structure and networks, and transport logistics, according to (Mwaura et al., 2016), define a company's overall profitability since they have a direct implication on supply chain costs and customer satisfaction. To better understand how businesses internationalize and the structural arrangements needed to increase the likelihood of success, the Transaction Cost Theory (TCT) has broadened its scope to include strategic management, supply chain management and international business (Yousuf 2017, Katarzyna 2014, Clem 2004, Rodrigo et al, 2010, Oliver 2007, Andrea-Oana 2007). Transporting defective items or components from the service center to the recycling center, moving useable parts to the manufacturing or assembly location, recycling recyclable parts to the plant, disposing of waste in landfills, and so on are all included in recycling. The performance, profitability, and reputation of a company depend heavily on how well these logistics are managed (Valentina & Rosa 2018; Orzan, et al 2018).

In GSCM studies, there is a wealth of opportunity to explore the different facets of transaction cost economics. Evaluating the true costs of choices and actions made on

various transaction kinds in a GSCM environment is one specific example. Several research on the environmental supply chain uses formal modeling that makes use of transaction costs and dynamics inside mathematical programming and optimization model frameworks (Cruz, 2008, 2009; Cruz and Matsypura, 2009; Cruz and Wakolbinger, 2008; Sheu et al., 2005; Yang et al., 2009). Furthermore, one area that researchers see as promising for further research is the modeling of transaction costs for GSCM using game theoretic methods (Carter and Jennings, 2002).

Transactional Cost Model is relevant to this study since it attributes inefficiencies to businesses' inability to integrate contributions from various functional areas to comprehend and meet predetermined objectives. GSCM tactics aim to improve performance by cutting expenses. Thus, this notion was supported by the GSCCM techniques used in this investigation. This theory underpins the research by establishing a connection between the variables and the significance of eco-design, eco-manufacturing, eco-purchasing, and eco-distribution in attaining optimal organizational performance.

2.5.3 Organizational Culture Theory

Organizational Culture Theory (OCT) posits that shared beliefs, values, and assumptions shape how members interpret their environment and behave within an organization (Schein, 2010; Chatman & O'Reilly, 2020). Its foundation was the notion that an organization's environment is influenced by its members' attitudes and behaviors. Organizational Culture Theory (OCT) explains how shared values, beliefs, norms, and symbols within an organization shape behavior, communication, and performance. The theory's central tenet is that organizational cultures differ dramatically from one another. The theory suggests that culture acts as the “glue” that binds members

together, influences identity, decision-making, and guides how employees interpret and respond to their environment. The authors contended that the best approach for identifying the distinctive traits and cultures present in each organization is an ethnographic or natural approach. They also contended that meanings helpful to comprehending how employees operate and view their work environment might be found by researchers by analyzing the stories, practices, rituals, verbal and nonverbal routines, and artifacts of an organization.

The term "performance" was later adopted by Pacanowsky and O'Donnell-Trujillo (1983) to refer to the situational and variable interfaces through which members of an organization create organizational reality (Nugraheni, Y., & Puspa, R. (2023)). They separated performances into five further subcategories: enculturation, ritual, passion, social, and political. Events that are a regular feature of a person's or a work unit's routine are referred to as ritual performances. Social customs like end-of-year parties or workplace team-building workshops may also be a component of this performance. Stories told with emotion, along with catchphrases or metaphors, define a passion performance. Social performances are courteous and etiquette-related behaviors. The exercise of power and influence is the explanation given for political performances. Last but not least, enculturation performances are structured methods that give staff members resources to grow and perform better. Organizations use a variety of techniques to achieve the goal of enculturation, including group training, online learning, simulated practice, and mentorship programs. Numerous scholars have used the organizational culture theory to study different organizational cultures since Pacanowsky and O'Donnell-Trujillo (1982) originally introduced it (Cameron & Quinn, 1999; Kim, 2017; Markovic, 2012, among others).

This theory therefore was related to the main objective of this study which was to determine the moderating effect of organizational culture on green supply chain management strategies on the performance of sugar companies in Western Kenya.

2.6 Empirical Literature Review

2.6.1 Green procurement and performance

Globally, a lot of businesses are trying to buy goods and services that don't hurt the environment either locally or globally (Lacroix & Stamatiou, 2007).

Lacroix (2008), Zhu et al. (2008), Melnyk et al. (2003), and Newbold (2006), stated that risk assessment for energy and resource use, environmentally friendly raw materials, effective processes to reduce solid waste, air emissions, and conserve energy and environmental management system (ems), and the use of tools that consume less energy, water, and fuel are typical examples of green procurement programs.

Empirical studies have demonstrated that efficiency qualities such as speed and delivery have a favorable implication on production costs for companies that prioritize environmentally friendly buying procedures (Vachon & Klassen 2006a; Zhu et al. 2008).

Due to shortened lead times, product development, and ecologically conscious reverse logistics programs, management and staff dedication to green procurement practices fosters innovation and technological advancement in supply chain processes and practices, which ultimately helps lower operating costs (Krikke, Blanc & Van de Velde, 2003).

Green procurement practices, according to Lacroix and Stamatiou (2007) and Lacroix (2008), help businesses become cost-efficient by reducing waste management and

hazardous material management fees, requiring less time and money for reporting, and saving money on fuel, energy, and other resources.

As explained by Handfield et al. (2005), companies that adopt green procurement strategies can also increase efficiency by reducing product landed costs, cheaper waste disposal, adhering to hazardous material regulations, and creating unique products.

Hart and Dowel (2010) propose, using RBV, that companies adopting green procurement as a strategic resource will have a greater chance of minimizing production costs by reducing fees associated with waste management, hazardous material management, and reporting; they will also save money by conserving fuel, energy, and other resources, all of which will improve performance.

2.6.2 Green manufacturing and performance

Ogola and Mburu (2014) define green manufacturing as a production process that uses inputs with comparatively low environmental impacts, that are extremely economical, and that generate very little or no waste or pollution. Green manufacturing is defined by Ogola and Mburu (2014) as a production method that uses inputs that have relatively little influence on the environment, produce little to no waste or pollution and are incredibly cost-effective.

According to Dheeraj and Vishal (2012), green manufacturing improves environmental performance and productivity for overall socioeconomic growth, which leads to a long-term improvement in the calibre of an organization's output.

Green manufacturing, according to Dheeraj and Vishal (2012), refers to the application of appropriate productivity and environmental monitoring and evaluation tools in conjunction with processes that lessen an organization's environmental impact through

its operations, products, and services while increasing profitability and competitive advantage.

Phungrassami (2008) lists the following as examples of green manufacturing practices: environmental management system (EMS), process improvements, energy and water conservation, regulatory compliance, ISO 14001, OHSAS 18001 (Occupational Health and Safety Management System), material and resource selection, assessments, and audits.

Still, Newbold (2006) lists enterprise carbon accounting, sustainable machine tools, sustainable packaging, embedded energy, materials, water, and consumables in impact and life cycle assessment tools for manufacturing, risk assessment for energy and resource use, and design for sustainability as practices for green manufacturing.

According to Lacroix and Stamatiou (2007), there are several advantages to green manufacturing, such as decreased waste and rework, less hazardous waste produced, enhanced environmental performance, avoided compliance and liability costs, and less raw material, resource, and energy consumption for the production of cost-effective products.

As per the findings of Min and Mentzer (2004), Mentzer et al. (2001), and Min et al. (2007), companies that have adopted green manufacturing techniques stand to gain an advantage over their rivals by offering a superior total value to their customers.

2.6.3 Eco-Design and performance

Product stewardship integrates external stakeholders and life cycle analysis into the eco-design development stages. Environmentally friendly products can track their environmental impact till the end of their useful life (Rocca, Acerbi & Fumagalli,

2023). The first-mover advantage, according to Kleindorfer et al. (2005), happens when a business incorporates environmentally friendly innovations into product design and increases benefits, such as creating distinctive manufacturing capabilities and receiving royalties for licensing green technology. It also involves building proprietary information that will result in a sustainable competitive edge.

In a similar vein, (Serio et al., 2020) explain that environmentally friendly products have a big influence on the survival of businesses which can also be used as a weapon to gain a sustained competitive advantage in the marketplace. Many firms now incorporate environmentally-friendly techniques into new product development as a way to differentiate their offerings and secure a sustainable competitive advantage (Zhu et al., 2023; Horn et al., 2023; Almeida et al., 2023). Without a doubt, supplier management, customer management and internal management all play a significant role in eco-design processes (Lin et al. 2013).

Büyüközkan and G. Öifçi (2012) suggested that businesses that successfully implement eco design principles can lower the negative environmental implications of their operations and goods by 80%. Zhu et al. (2007) carried out an empirical investigation of China's auto industry. They discovered that environmentally friendly design techniques greatly enhanced businesses' contributions to sustainability while simultaneously reducing adverse environmental effects.

According to Gonzalez-Benito and Gonzalez-Benito (2005), businesses that prioritize eco-design can reduce on the use of dangerous components in their products as well as the number of resources used in their production. Furthermore, green design makes things easier to disassemble, reuse, remanufacture, and recycle. Consumers are more likely to buy environmentally friendly products to benefit from lower costs and

environmental protection, and eco-design products that have a favorable and significant impact on organizational performance (Lin et al., 2013).

According to the findings, adopting eco-design methods improves a company's reputation and image in the marketplace, builds competitive advantage, and has a favorable association with environmental performance and enterprise financial (R-J. Lin et al., 2013; Zailani et al., 2012). In addition, eco-design products reduce the cost of products and most importantly improve the product value.

2.6.4 Green distribution and performance

According to Wu and Dunn (2008), the two most crucial aspects of distribution are packaging design and warehousing. They contend that thoughtful green distribution strategies, such as using standardized reusable containers, reducing the amount of packaging used, designing efficient warehouse layouts, and providing easy access to eco-information, can save operating costs by reducing storage and retrieval delays and ultimately improve business performance while being environmentally responsible.

There has been limited research on how green distribution affects consumer connections (Zhu and Sarkis, 2006). One type of green initiative that can play a significant role in greening the distribution function is encouraging suppliers to use reusable packaging. Rao and Holt's (2005) study found that companies that adopted environmentally friendly packaging schemes saw increases in market share.

Wu and Dunn (2008) find that businesses that eco-label their products see an increase in customer loyalty. Ninlawan et al. (2011) state that companies in Thailand that package their goods in reusable containers had great levels of customer satisfaction concerning customer service and brand loyalty.

Ninlawan et al. (2011) states that businesses that use recycled packaging benefit from reduced trash disposal costs, financial savings from not having to purchase new packaging, and the elimination of ancillary expenditures related to purchasing new packaging (such as branding and storage). These have the compound effect of lowering operating costs, boosting brand loyalty, and enhancing the performance of businesses.

2.6.5 Organization culture and performance

Organizational culture is a set of frequent presumptions, beliefs and attitudes that directs behavior inside the organization. Because it specifies who its important suppliers, customers, employees, and rivals are and how to communicate with them, it has a profound impact on a business (Barney, 2012).

According to Zehir, Ertosun, Zehir, and Muceldili (2011), organizational culture plays a crucial role in fostering good leadership that supports process innovation, business performance and technological advancements. This is because an effective organizational culture is essential to achieving effective performance in the current competitive market environment (Robinson et al., 2005).

Furthermore, according to Jones, Cline, and Ryan (2006), organizational culture facilitates employees' acquisition and exchange of knowledge inside the workplace, acting as a source of knowledge. As a result, according to Yesil and Kaya (2013), organizational culture does have a significant impact on performance. In this sense, earlier research has called for a closer look at the relationship between organizational culture and performance, as evidenced by the works of Elnihewa (2015), Romle (2014), Umrani (2016), and Wunderlich and Beck (2017).

According to Nelson and Quick (2011), cultures frequently operate on a theoretical, emotional, and unseen form structure that enables workers to achieve their basic

requirements on a social and physical level. Organizational culture not only boosts employee commitment but also provides workers with a perception of identity, upholds work-based principles, and acts as a control mechanism.

Maina (2016) carried out a study on the impact of organizational culture on the performance of commercial banks in Kenya. The study's findings included the following: employees felt that their organization's culture dictated how things were done; they shared related beliefs and values; the organizations were guided by values of consistency, adaptability, and an efficient communication system; and employees felt more committed to their work because they felt like they belonged. Nelson and Quick (2011) agreed with Maina (2016) conclusions that organizational culture fosters a feeling of identity among employees, upholds work-based values, and acts as a check on work-related ethics in addition to improving employee commitment.

Most people agree that an institution's culture plays a significant role in its performance. It is an idea that interacts with various internal organizational components as well as the external environment. Adriana et al. (2009) studied performance and organizational culture in Brazil, concentrating on the purchase of a state-owned electricity distribution company in Brazil. The goal of the study was to determine whether the performance metrics that the acquiring business used in the post-acquisition phase aligned with the aspects of organizational culture (values, practices, and heroes) that were determined by ecological factorial analysis.

Murphy et al. (2013) conducted research titled "Firm culture and performance: intensity's effects and limits" in *Management Decisions*, which furthered our understanding of the impact of organizational culture on performance. The study aimed to elucidate specific characteristics of business culture, define its impact on

performance results, and investigate culture intensity theoretically while considering its implications and constraints. Findings indicate a beneficial relationship between culture and performance, coordination, and cooperation.

To investigate the association between four cultural dimensions of the competing values framework (CVF)—group, developmental, hierarchical, and rational cultures—and four performance categories—product quality, process quality, product innovation, and process innovation—Prabogo and McDermott (2011) conducted a study. According to the research findings, connections between developmental culture and three of the performance measures—product quality, product innovation, and process innovation—show that it is the strongest predictor among the four cultural characteristics. In addition to group and hierarchical cultures, rational culture is related to product quality and influences process quality prediction.

2.6.6 Green supply chain management and performance

Environmental and economic business performances are the two ways to explore the performance of GSCM activities. While economic performance focuses more on the cost component, environmental performance looks at minimizing ecologically damaging elements (Zhu et al., 2004). Certain research, like that conducted by Zhu and Sarkis (2004), revealed that there was little to no correlation, if any, between the performance of the organization and green supply chain policies. In any event, a variety of strong and distinct relationships link organization performance to economic performance, which is still the most important need for the majority of organizations. Understanding and characterizing the acceptance of GSCM concerns in a much larger setting is necessary, as is conceptualizing how GSCM frameworks fit into the environment.

Omange and Nyamwange's (2010) study, "Green Supply Chain Management Practices and Competitiveness of Commercial Banks in Kenya," found a statistically significant positive correlation between GSCMP and a firm's competitiveness. Okello and Were (2014) found a link between listed firms' success on the Nairobi Stock Exchange and their use of supply chain management techniques.

Insights on the impact of GSCM methods on present and future supply chain performance measurements—which focus on matters directly relevant to management—are offered by Malaba, Ogolla, and Mburu (2014). Studies have yielded insights into likely references to supply-chain relationships that improve environmental performance (Handfield et al., 2002).

In addition to analyzing best practices in green supply chain management, Amemba's (2013) study in the hospitality industry also gauged the extent to which these practices were being adopted. An extensive interview was carried out to discuss green production, distribution, reverse logistics, and procurement.

Choi and Zhang (2011) established a connection between green practices and business performance. They discovered that a small number of organizations connected the dots between environmental requirements and how businesses were able to stay profitable. In his research, Otago (2009) unequivocally states that green supply chain management contributes to reducing the adverse environmental effects of industry and its operations, resulting in long-term environmental performance. Therefore, the incorporation of GSCM centres on the function of sufficient communication in putting GSCM into practice.

Pun (2006) claims that environmental concerns have compelled the majority of businesses to abide by environmental rules, such as those in the ISO 1400 series and

others in which Kenya is involved. In Kenya, adherence to sustainable development principles and the preservation of raw materials have resulted from modern regulatory norms (GOK, 2006). Kenya has adopted some green economy-related methodologies and approaches. These include positioning the green economy in its report of the Second Medium Term (2013-2017), implementing sustainable tariffs in 2008, and adopting a reasonable regular asset use in the 2010 Constitution (UNEP, 2014). The relationship between a company's budgetary execution and environmental management, however, has logically been inconsistent due to corporate environmental initiatives that have augmented both positive and poor economic execution.

In their study, Pamela Getuno and Osoro (2013) highlight various aspects of managing a green supply chain. The persistent rise in greenhouse gas emissions and environmental contamination caused by businesses has prompted organizations to execute supply chain operations to use the least number of resources possible. To achieve the idea of a sustained supply chain process, the majority of Kenyan businesses must accept the green supply chain segments as a recurrent norm, according to study analysis done from pertinent publications and earlier studies. To optimize the adoption of green supply chain management, a change that will need businesses to align their operations with future goals, their work advocates for the significance of enhanced escalations in other organizational processes.

According to a study by Perotti (2012), some participants have shown a more proactive attitude and have begun to benefit significantly from the adoption of GSCP, mainly in terms of environmental and economic performance. However, the research also found that the current level of adaptation of GSCP is still limited among the economic, environmental, and operational domains. The study also looked into the benefits of

GSCP in terms of company performance. However, the study by Holt and Ghobadain (2009) discovered that average manufacturers thought there was more internal and external demand to enhance environmental performance. According to Bjorklund et al. (2012), the study highlights flaw in previous research and reveals how environmental performance assessments are designed in supply chain management.

2.6.7 Green supply chain management strategies, organizational culture and performance

Lozano, Barreiro-Gen and Zafar (2023), Argues that truly sustainable institutions integrate environmental values into their organizational philosophy, leadership, and learning systems. According to Crane (2000), adopting green practices may be hampered by an institutional ideology that is too rigid.

Similarly, a 2003 study by Molnar and Mulvihill revealed that a company's culture, mission, and dream must all include sustainability. Furthermore, Schein and Schein, (2021). Highlights that sustainability-oriented cultures rely on shared norms and artifacts that symbolize environmental commitment throughout the organization.

When Cranes and Harris (2002) examined whether green institutional ideologies existed in businesses, they found that subcultures could impede the development of a green culture that permeates the entire organization. She concluded from her case study of Grenville (2006) that an organization's culture and the presence of subcultures determine the ecological issues it chooses to address. According to Linnenlueckes, Russell, and Griffiths (2009), employee comprehension of sustainability inside a company can be influenced by subcultures within that company. According to the researcher's knowledge based on a survey of the literature, it is unknown to limit the

investigation to the indirect impact of organizational culture on performance through sustainable practices.

2.7 Summary of the Literature Review

The concept of GSCM is evident in the sketch, however not many studies have been completed in Kenya. The estimates in the GSCM section have not been thoroughly studied. The literature has looked at the four GSCM techniques that businesses adopt, but different businesses implement completely different methods, hence there are no universally acknowledged norms.

Green supply chain management, or GSCM, is essential for influencing how any organization engaged in supply chain activities will affect the environment overall. It guarantees increased organizational output, enhances product quality, and simultaneously increases sales turnover. But more importantly, GSCM can contribute to long-term performance improvement (Zhu and Sarki, 2006).

2.8 Critique of Existing Literature

Traditionally, supply chain management has been thought of as a process that transforms raw resources into finished goods and then delivers them to the final customer. According to Srivastava (2007), this approach entails the extraction and exploitation of natural resources. It's critical to recognize that, in the past ten years, environmental sustainability has become a major concern for corporate operations. Internal environmental control and investment healing are two examples of GSCM processes that many supply chain organizations have started. However, there hasn't been much focus on the growth of recycled material markets and investment restoration in poor countries. This shows that while the manufacturing sector is growing, it still has to reach a significant size to justify investing in more environmentally friendly

production techniques. According to Zhu and Sarki (2006), environmental sustainability ensures that manufacturers take into account environmental effects throughout the entirety of the product life cycle, which in turn provides an incentive for organizations to adopt GSCM techniques and close the production supply chain loop.

2.9 Research Gaps

Businesses are beginning to realize that different degrees of environmental legislation and compliance difficulties are present in global supply chains. Consumers are becoming more and more inquisitive about the items they purchase, including what effect upcoming environmental regulations will have on them. Nevertheless, few research has looked at GSCM practices in poor nations, particularly Kenya. Therefore, it is necessary to talk about the pertinent environmental concerns that are coming up in procurement, build green supply chain policies, and inform all the supply chain stakeholders of them. Purchasing environmentally friendly products can occasionally cost more than purchasing non-eco-friendly ones. This situation may deter consumers who are looking for less expensive products without major environmental benefits from making green purchases. However, paying more doesn't always equate to purchasing greener items, especially when additional costs are taken into account. To operate effectively in their business environment, companies work together with their customers and suppliers. Since GSC can save resources, eliminate or reduce waste, improve efficiency and effectiveness, and eventually gain a competitive advantage, it is necessary to comprehend and define the essence of GSCM issues in a much wider context and to conceptualize how GSCM systems interact with nature in the short and long terms. The adoption or use of sustainable practices—rather than performance—is the primary subject of the majority of studies on organizational culture.

Thus, the moderating role of organizational culture in the relationship between green supply chain management practices and the performance of sugar companies in Western Kenya was the key focus of this study.

2.10 Conceptual framework

A conceptual framework, according to Orodho (2009), makes it easier to understand how variables relate to one another in a study and enables a graphic representation of the variables.

The performance of sugar companies was the dependent variable in the conceptual framework, with organizational culture as the moderator and green supply chain management strategies as the independent variables.

Green supply chain management

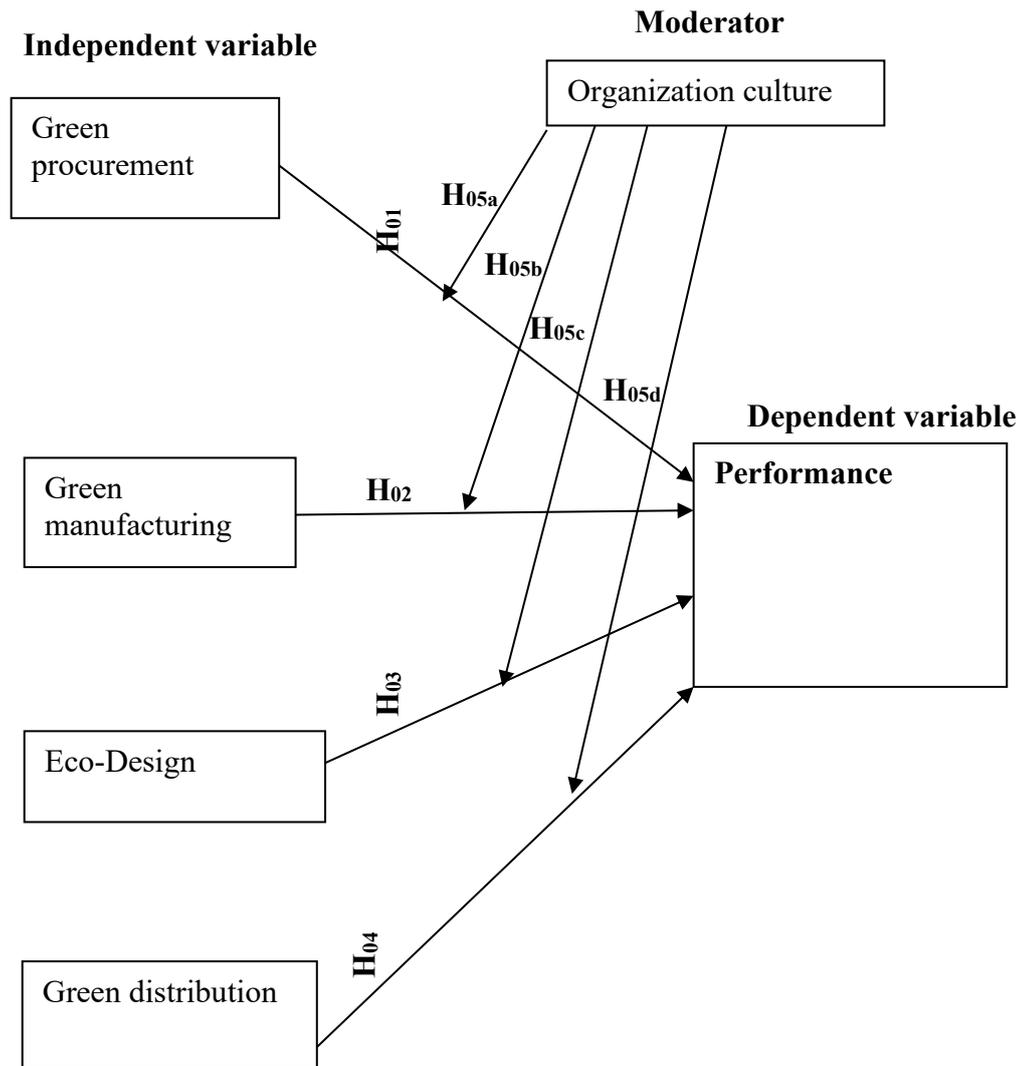


Figure 2. 1: Conceptual Framework

Source: Researcher, 2024

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter described the methods used to ascertain the moderating role of organizational culture in the relationship between the performance of sugar companies in the Western Kenya and green supply chain management strategies. The following components of the study were used: data collecting, data analysis, sampling technique, population sample design, and research design.

3.2 Research Design

Cook, Deutch, and Jahoda "A research design is the setup of parameters for data collection and analysis to balance economy and procedure with relevance to the research purpose."

The research used a cross-sectional and explanatory research approach to investigate how the GSCM strategy affects organizational performance in the western region's sugar business. The reasons for certain phenomena, or the "why" behind them, were the main focus of the inquiry. Comparison and determinants of change are not involved. Thus, the goal of explanatory research is to ascertain the "why" of correlations. Every explanatory study has a set of guiding principles that direct the researcher's fact-finding efforts.

3.3 Target population

A population is a collection of individuals or research subjects who are studied in a specific study and who are comparable to each other in one or more aspects. This study's target demographic included ten sugar enterprises located in western Kenya. The managers, middle managers, and supervisors from the production, operation, and

procurement departments of the chosen sugar factories participated in the study. The Kenya Sugar Board estimates that the chosen departments employ about 500 people across all sugar facilities.

Table 3. 1: target population of the study

Sugar factories	Number of respondents
West Kenya Sugar company	80
Butali mills factory	60
Chemilil sugar company	50
Muhoroni sugar company	50
Nzoia sugar company	70
South Nyanza Sugar Company	50
Kibos sugar company	45
Sony sugar company	35
Sukari industries	30
Busia sugar company	30
TOTAL	500

Source: Kenya Sugar Board

3.4 Sample and Sampling Techniques

The process comprised identifying the population, setting up the sample frame, calculating the sample size, and specifying the sampling technique (Quee, 2001). This made sure that cases that fit the study purpose and allowed for the answer to the research question were chosen using expert judgment.

The sample was drawn at random from each company's designated departments, which included the procurement, production, and operation departments. The sample consisted of managers, middle-level managers, and supervisors. Yamane (1967:886) was used in the study to determine the sample size. According to the calculations below, which used the Yamane formula with a 95% confidence level and a 0.05(5%) accuracy level, the study's sample size was 222 respondents.

$$n = \frac{N}{1 + N(e)^2}$$

Where n is the sample size required

N is the population size

e is the precision level

$$n = \frac{500}{1 + 500(0.05)^2} = 222 \text{ respondents}$$

Table 3. 2: sample size

Sugar companies	Target population	Formula	Sample size
West Kenya Sugar company	80	80/500*222	36
Butali mills factory	60	60/500*222	27
Chemilil sugar company	50	50/500*222	22
Muhoroni sugar company	50	50/500*222	22
Nzoia sugar company	70	70/500*222	31
South Nyanza Sugar Company	50	50/500*222	22
Kibos sugar company	45	45/500*222	20
Sony sugar company	35	35/500*222	16
Sukari industries limited	30	30/500*222	13
Busia sugar company	30	30/500*222	13
TOTAL	500		222

3.5 Research Instruments

A significant instrument for primary data collection in the study was a self-administered questionnaire containing both structured and semi-structured items related to the study objectives. Since questionnaires are efficient tools for gathering data and enable respondents to share a wide range of viewpoints regarding the study question, they were used (Dempsey, 2003).

Kothari (2006) asserts that as questionnaire data is collected without the influence of researchers or bias, reliable and accurate information is acquired.

3.6 Data Collection Procedure

Self-administered questionnaire was used to collect data. According to Kothari (2004), a self-administered questionnaire was preferred because it was inexpensive, gave respondents enough time to complete it, was devoid of interviewer bias, and could be distributed to a large number of respondents. After being completed, the surveys were picked up on a prearranged day from the respondents' place of employment.

3.7 Pilot Study

Feasibility studies, or pilot studies, are small-scale iterations or trial runs carried out in advance of the main study. Transmara Sugar Company in Kiligoris conducted a pretest before the study began so the researcher could assess the instrument's usability and intelligibility. Mugenda & Mugenda (2003) state that 10% of the sample size was deemed sufficient for pilot research and that pre-testing enables errors to be found before the start of actual data collection. To assess validity and reliability of the study instrument, the investigator chose a pilot group including 22 persons from the intended demographic. The study itself did not contain the pilot data.

3.7.1 Validity

Validity, as defined by Carter and Porter (2000), Knapp (1998) and Peat (2002), is the degree to which the instrument measures the things it claims to measure. The precision and significance of conclusions drawn from study findings constitute validity (Mugenda & Mugenda, 2008). When a questionnaire genuinely measures the things, it says it will measure, it is considered legitimate. A study's quality can be demonstrated by some validity measures. The overall study design was related to both internal and external validity. The degree to which a research study's design adequately tests the hypothesis or is appropriate for the research topic is known as internal validity (Carter

& Porter, 2000). Conversely, external validity pertains to the extent to which research findings can be applied outside of the specific study population and context (Carter & Porter, 2000). As a result, the following Peat (2002) measures were employed in this study to evaluate the validity of the data-gathering tool:

a) Content validity

A qualitative form of validity known as content validity involves clearly defining the concept's domain and assessing whether the measures accurately capture it. It refers to the degree to which an instrument seems to measure what it claims to measure. By developing the scales using ideas about Green Supply Chain Management practices and business performance (Carter & Porter, 2000) and adding remarks from GSCM specialists to the instruments content (Peat, 2002), the researcher was able to add content validity to the measures.

b) Criterion validity

The ability of a measure to forecast an event connected to pertinent criteria is referred to as criterion validation (Trochim, 2006). Criteria validity can be measured using either concurrent or predictive validity (Trochim, 2006). Concurrent validity compares a newly developed metric to an established, widely used benchmark. The ability of a test to forecast a future event is known as predictive validity (Smallbone & Quinton, 2004).

c) Construct validity

It refers to the extent to which an instrument assesses the characteristic or theoretical construct that it is designed to measure is known as construct validity (Shadish, Cook & Campbell, 2001).

3.7.2 Reliability

The extent to which a measuring technique produces consistent results after multiple trials is known as reliability (Neuman, 2000; Mugenda, 2008). According to Patterson (2002), a test is considered reliable if it regularly measures the same thing. Internal consistency and stability across time are two characteristics of a dependable measure, according to Smallbone and Quinton (2004). The Cronbach's alpha reliability measure will be used to assess reliability. A grading system for acceptable alpha was presented by Zikmund (2003) and Ritter (2010) as 0.60 and above. They state that an internal reliability index of greater than 0.60 is indicative of strong internal consistency.

3.8 Data Processing and Analysis

Using the Statistical Package for Social Science (SPSS), quantitative data from the surveys was coded for analysis and examined for errors and completeness. To evaluate quantitative data, the frequencies, means, and standard deviations displayed the distribution versus each variable under study, they were suitable statistical tools. Correlation analysis was used in inferential statistics to determine the type of relationship between the variables. The study also established the moderating influence of organizational culture on the connection between the independent variable and dependent variable using hierarchical multiple regression analysis (stepwise approach).

Multiple regression models

The multiple regression equation for this study represented the relationship between the dependent variable (Y) as a linear function of the independent variables (Green Procurement- X_1 , Green Manufacturing- X_2 , Eco-Design- X_3 , and Green Distribution- X_4), with ϵ representing the model deviations (error term) (Cooper & Schindler, 2006; Hesketh&Skronidal, 2008) was given by:

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

To establish the effect of the moderating variable in the study, an additional term was added to the multiple regression equation to incorporate the influence of the moderating variable organization culture (M) given by;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 M + \beta_6 M X_1 + \beta_7 M X_2 + \beta_8 M X_3 + \beta_9 M X_4$$

Multiple regression analysis

Model 1: Testing the direct effect of an independent variable on the Dependent variable.

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

Model 2: Testing the moderating effect of organizational culture on performance.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 M + \varepsilon$$

Model 3: introducing the first interaction term between the moderating variable and independent variable on performance.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 M + \beta_6 M X_1 + \varepsilon$$

Model 4: introducing the second interaction term between the moderating variable and independent variable on performance.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 M + \beta_6 M X_1 + \beta_7 M X_2 + \varepsilon$$

Model 5: introducing the third interaction term between the moderating variable and independent variable on performance.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 M + \beta_6 M X_1 + \beta_7 M X_2 + \beta_8 M X_3 + \varepsilon$$

Model 6: introducing the fourth interaction term between the moderating variable and independent variable on performance.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 M + \beta_6 M X_1 + \beta_7 M X_2 + \beta_8 M X_3 + \beta_9 M X_4 + \epsilon$$

However, the following assumptions were made under the multiple regression models:

i. Normality test

Variables with normal distributions are assumed in regression. Significant outliers and highly skewed or kurtotic data, as well as non-normally distributed variables, can skew significance tests and connections. The researcher can verify this assumption using some helpful pieces of information, including P-P plots, skew, kurtosis, and visual inspection of data plots, which provide information about normalcy; Kolmogorov-Smirnov tests also provide inferential statistics on normality. Data can be converted to z-scores or examined visually in histograms or frequency distributions to find outliers. The Shapiro-Wilk test for normalcy is used to determine normalcy.

ii. Linearity test

Only linear relationships between dependent and independent variables can be effectively estimated using standard multiple regression. Regression analysis results will underestimate the underlying relationship if there is a nonlinear relationship between the independent variables (IV) and the dependent variable (DV). Two hazards are associated with this underestimation: one is an increased likelihood of a Type II error for that IV, and the other is an increased risk of Type I errors (over-estimation) for additional IVs that share variance with that IV in the case of multiple regression, Scatter plots are used for testing.

iii. **Homoscedasticity test**

When a variable's variability is uneven throughout the range of values of a second variable that predicts it, this is known as homoscedasticity (Vinod, 2008). The Cook-Weisberg/Breuch-Pagan test will be used to determine homoscedasticity in this investigation. Breusch-Pagan/Cook-Weisberg test compares the alternative—that the error variances are a multiplicative function of one or more variables—with the null hypothesis, which is that the error variances are all equal (Vinod, 2008). The presence of homoscedasticity is apparent when the "Prob > Chi-squared" score is higher than 0.05.

iv. **Multicollinearity Test**

A multiple regression model exhibits multicollinearity if two or more of its independent variables have a high degree of correlation. Kothari (2004), indicates that a non-trivial degree of accuracy can be achieved by linearly predicting one from the others. Strong correlations between the independent variables are undesirable since they raise the standard errors of the coefficients. The Variance Inflation Factor (VIF), which gauges multicollinearity in the regression model, is used to assist in assessing multicollinearity. According to Bryman and Cramer (2012), if two or more variables have a VIF of around or greater than 5, one of these variables needs to be excluded from the regression model. As a general rule of thumb, VIFs surpassing 4 demand further studies.

3.9 Ethical Considerations

According to Mugenda and Mugenda (1999), researchers are persons who sincerely care about the standard of life of others. They must be honest individuals who will not do research for their benefit or in a way that would hurt others. By requesting consent from the businesses to obtain a permit for the study, ethical considerations were upheld.

Before the study, consent was obtained from each participant as well as the managing directors. Respondents' privacy and confidentiality were protected; appropriate numbers were used in place of names. The responders received written or verbal instructions outlining the goal of the study. By citing the origins of any data or information from other participants in the study, plagiarism was prevented. The study was conducted with integrity intact. No respondent was coerced or forced to answer questions they were not willing to respond to (Kombo & Tromp, 2006).

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATIONS

4.1 Introduction

The results, analysis, and interpretation of the data were presented in this chapter. Tables and graphs were used to display the results. The chapter specifically covered the topics of response rate, validity tests, reliability tests, demographics, descriptive statistics, regression analysis, correlation analysis, diagnostic tests, and testing of hypotheses. Every section was provided in detail to demonstrate why it was relevant to include in the study.

4.2 Response Rate

This section provided the response rate of all questionnaire issues and a justification of why that response rate was adequate for data analysis. The results of the response rate are presented in Table 4.1.

Table 4. 1: Response rate

Response rate	Frequency	Percentage
Response	179	80.6
Non-Response	43	19.4
Total	222	100

Source: Researcher (2024)

Based on the results presented in Table 4.1, the average response rate was 80.6%. Moreover, the response rate from West Kenya Sugar was 94.4%, while those from South Nyanza Sugar Company were at 54.5%. The respondent was considered adequate for additional examination and conclusion. Certain academics, like Kothari (2004) and Babbie (2004), suggest that an analysis is adequate if the response rate is greater than 60%. As a result, the 93.90% average response rate in the current study was deemed sufficient.

4.3 Descriptive Statistics

This section presents the descriptive statistics of Green Procurement, Green Manufacturing, Eco Design, Green Distribution, Organization Culture, and Performance. The responses ranged from 1-stronglydisagree, 2-disagree, 3-Neutal, 4-Agree and 5-stronglyagree. The mean and standard deviation are generated using a five-point Likert Scale.

4.3.1 Green Procurement

The descriptive statistics on Green Procurement are summarized in Table 4.2

Table 4. 2: Descriptive statistics on Green Procurement

Green Procurement Practices	SA	A	N	D	SD	Mean	Std Dev	Skewness	Kurtosis
	5	2	3	2	1				
We evaluate suppliers on specific environmental criteria	44.1 (79)	44.7 (80)	5.6 (10)	0 (0)	5.6 (10)	4.22	0.98	-1.905	1.067
We Purchase energy saving equipment	5.6 (10)	49.7 (89)	22.3 (40)	16.8 (30)	5.6 (10)	3.33	1.00	-0.701	-0.284
The company uses paperless methods to order materials	5.6 (10)	44.7 (80)	11.2 (20)	38.5 (69)	0 (0)	3.17	1.02	-0.029	-1.525
Company Procures products that are made using recycled packages	11.2 (20)	49.7 (89)	27.9 (50)	0 (0)	11.2 (20)	3.50	1.07	-1.098	0.851
We Require suppliers to have ISO 14001	44.1 (79)	33.5 (60)	16.8 (30)	0 (0)	5.6 (10)	4.11	1.05	-1.386	1.818
We Ensure suppliers meet their environmental objectives	11.2 (20)	83.2 (149)	5.6 (10)	0 (0)	0 (0)	4.06	0.41	0.425	1.964
Average						3.73	0.92		

Source: Researcher (2024)

The field results (descriptive statistics) depicted in Table 4.4 indicate that 44.1 (79) of the respondents strongly agreed that they evaluate suppliers on specific environmental criteria and another 44.7% (80) agreed on the same. On the other hand, 5.6% (10) of the respondents were neutral, and another 5.6% (10) strongly disagreed that they evaluate suppliers on specific environmental criteria, as supported by the mean score of 4.22 with a standard deviation of 0.98.

However, 5.6% (10) of the respondents strongly agreed that they purchase energy-saving equipment while 49.7% (89) agreed on the same assertion. Also, 22.3% (40) of the participants were neutral, 16.8% (30) disagreed and 5.6% (10) strongly disagreed with purchasing energy-saving equipment. The mean score of the survey question was 3.33 with a standard deviation of 1.00 and this signified that the majority of the respondents were neutral that they purchase energy-saving equipment.

In regards to the company using paperless methods to order materials, 5.6% (10) of the respondents strongly agreed while 44.7% (80) agreed. Moreover, 11.2% (20) of the respondents were neutral while 38.5% (69) disagreed that the company uses paperless methods to order materials, as supported by the mean score of 3.17 with a standard deviation of 1.02.

Nevertheless, 11.2% (20) of the respondents strongly agreed that the company procures products that are made using recycled packages while 49.7% (89) agreed on the same statement. On the other hand, 27.9% (50) of the participants were neutral and 11.2% (20) of them strongly disagreed that the company procures products that are made using recycled packages. The mean score was 3.50, with a standard deviation of 1.07. On the statement that they require suppliers to have ISO 14001, 44.1% (79) of the participants strongly agreed and 33.5% (60) agreed on the same assertion. Also, 16.8% (30) of the

respondents were neutral while 5.6% (10) strongly disagreed that they require suppliers to have ISO 14001. The mean score of the survey question was 4.11, with a standard deviation of 1.05.

Lastly, 11.2% (20) of the participants strongly agreed that they ensure suppliers meet their environmental objectives and another 83.2% (149) agreed on the same statement. Moreover, 5.6% (10) of the participants were neutral on the statement that they ensure suppliers meet their environmental objectives, as supported by the mean score of 4.06, with a standard deviation of 0.41. The average mean score of the survey questions on Green Procurement was 3.73, with a standard deviation of 0.92. This indicated that most survey participants agreed with most of the poll's questions. To verify that the distribution was normal, the Kurtosis test was also performed. Kurtosis values varied from -1.525 to 1.964. Celikoglu and Tirnakli (2018) state that response values for all items had a normal distribution since kurtosis values between -2 and +2 are deemed acceptable. The data was skewed to the left, and the mean and median were both less than the data set's mode, according to the negative values of the skewness statistics.

4.3.2 Green Manufacturing

The descriptive statistics on Green Manufacturing are depicted in Table 4.3

Table 4. 3: Descriptive Statistics on Green Manufacturing

Green Manufacturing	SA	A	N	D	SD	Mean	Std Dev	Skewness	Kurtosis
	5	2	3	2	1				
The company generates low or no waste or pollution	22.3 (40)	16.8 (30)	0 (0)	27.9 (50)	33 (59)	2.68	1.60	0.384	-1.523
Company incurs lower raw material costs	5.6 (10)	5.6 (10)	33.5 (60)	44.1 (79)	11.2 (20)	2.50	0.96	0.758	0.678
We encourage reuse of products and recycled materials	0 (0)	5.6 (10)	11.2 (20)	60.9 (109)	22.3 (40)	2.00	0.75	0.810	0.999
The company replaces hazardous substances with those that are environmentally friendly	16.2 (29)	0 (0)	22.3 (40)	27.9 (50)	33.5 (60)	2.37	1.37	0.825	-0.442
We control power consumption in the products	0 (0)	0 (0)	27.4 (49)	50.3 (90)	22.3 (40)	2.05	0.71	-0.071	-0.972
We produce products that have packages that can be recycled	0 (0)	5.6 (10)	21.8 (39)	44.7 (80)	27.9 (50)	2.05	0.85	0.459	-0.410
We ensure products have recyclable contents	0 (0)	0 (0)	16.8 (30)	60.9 (109)	22.3 (40)	1.94	0.62	0.039	-0.414
Average						2.23	0.98		

Source: Researcher (2024)

The field results (descriptive statistics) depicted in Table 4.3 indicate that 22.3% (40) of the respondents strongly agreed that the company generates low or no waste or pollution and another 16.8% (30) agreed on the same. On the other hand, 27.9% (50) of the respondents disagreed, and another 33% (59) strongly disagreed that the company generates low or no waste or pollution, as supported by the mean score of 2.68 with a standard deviation of 1.60.

However, 5.6% (10) of the respondents strongly agreed that the company incurs lower raw material costs while 5.6% (10) agreed on the same assertion. Also, 33.5% (60) of the participants were neutral, 44.1% (79) disagreed and 11.2% (20) strongly disagreed that the company incurs lower raw material costs. With a standard deviation of 0.96 and a mean score of 2.50 for the survey question, most respondents did not agree that the company's raw material costs are reduced.

In regards to encouraging reuse of products and recycled materials, 5.6% (10) of the respondents agreed. Moreover, 11.2% (20) of the respondents were neutral, 60.9% (109) disagreed and 22.3% strongly disagreed that they encourage reuse of products and recycled materials, as supported by the mean score of 2.00 with a standard deviation of 0.75.

Nevertheless, 16.2% (29) of the respondents strongly agreed that the company replaces hazardous substances with those that are environmentally friendly. On the other hand, 22.3% (40) of the participants were neutral and 33.5% (60) of them strongly disagreed that the company replaces hazardous substances with those that are environmentally friendly. The mean score was 2.37, with a standard deviation of 1.37.

On the statement that they control power consumption in the products, 27.4% (49) of the participants were neutral. Also, 50.3% (90) of the respondents disagreed while

22.3% (40) strongly disagreed that they control power consumption in the products. The mean score of the survey question was 2.05, with a standard deviation of 0.71.

According to the findings in the table above, 5.6% (10) of the respondents agreed that they produce products that have packages that can be recycled and another 21.8% (39) were neutral on the same assertion. However, 44.7% (80) of the respondents disagreed while 27.9% (50) strongly disagreed with producing products that have packages that can be recycled, as supported by the mean score of 2.05, with a standard deviation of 0.62.

Lastly, 16.8% (30) of the participants were neutral on the statement that they ensure products have recyclable contents and another 60.9% (109) disagreed on the same statement. Moreover, 22.3% (40) of the participants strongly disagreed with the statement that they ensure products have recyclable contents. The mean score was 4.22 with a standard deviation of 1.233.

Ultimately, with a standard deviation of 0.98, the mean average score for the green manufacturing survey items was 2.23. This indicated that most respondents didn't agree with most of the poll questions. In addition, the distribution's normality was tested using the Kurtosis test. Kurtosis levels varied from -0.972 to 0.99. According to George and Mallery (2010), kurtosis levels between -2 and +2 are deemed appropriate for demonstrating a normal univariate distribution. This indicates that there was a normal distribution of response values. Ho and Yu (2015) state that when skewness is positive, the data is positively skewed, or skewed right, which indicates that the distribution's right tail is longer than its left. The data are negatively skewed or skewed left if the skewness is negative, which indicates that the left tail is longer. As a result, the skewness statistics showed positive values, suggesting that the right tail was longer.

4.3.3 Eco Design

The descriptive statistics on Eco Design are summarized in Table 4.4

Table 4. 4: Descriptive Statistics on Eco Design

Eco Design	SA	A	N	D	SD	Mean	Std Dev	Skewness	Kurtosis
	5	2	3	2	1				
The company uses cleaner technology processes	16.8 (30)	72.1 (129)	5.6 (10)	5.6 (10)	0 (0)	4.00	0.67	-1.131	1.702
We use green raw materials and components	49.7 (89)	39.1 (70)	11.2 (20)	0 (0)	0 (0)	4.39	0.68	-0.659	-0.667
We provide design specifications to our partners that include environmental requirements for purchased items.	22.3 (40)	66.5 (119)	11.2 (20)	0 (0)	0 (0)	4.11	0.57	0.012	0.009
We design our products for reuse, recycling, and recovery of material and component parts	33.5 (60)	27.9 (50)	16.8 (30)	21.8 (39)	0 (0)	3.73	1.14	-0.345	-1.307
We design our products to avoid or reduce the use of hazardous products and their manufacturing process.	22.3 (40)	60.9 (109)	16.8 (30)	0 (0)	0 (0)	4.06	0.62	-0.039	-0.414
Average						4.06	0.74		

Source: Researcher (2024)

The descriptive statistics depicted in Table 4.4 indicate that 16.8% (30) of the respondents strongly agreed that the company uses cleaner technology processes and another 72.1% (129) agreed on the same. On the other hand, 5.6% (10) of the respondents were neutral, and another 5.6% (10) disagreed that the company uses cleaner technology processes, as supported by the mean score of 4.00 with a standard deviation of 0.67.

However, 49.7% (89) of the respondents strongly agreed that they use green raw materials and components while 39.1% (70) agreed on the same assertion. Also, 11.2% (20) of the participants were neutral on the statement that they use green raw materials and components. The mean score of the survey question was 4.39 with a standard deviation of 0.68 and this signified that the majority of the respondents agreed that they use green raw materials and components.

In regards to providing design specifications to our partners that include environmental requirements for purchased items, 22.3% (40) of the respondents agreed. Moreover, 66.5% (119) of the respondents were neutral, and 11.2% (20) were neutral on the statement that they provide design specifications to our partners that include environmental requirements for purchased items, as supported by the mean score of 4.11 with a standard deviation of 0.57.

Nevertheless, 33.5% (60) of the respondents strongly agreed that they design our products for reuse, recycling, and recovery of material and component parts while 27.9% (50) agreed on the same statement. On the other hand, 16.8% (30) of the participants were neutral and 21.8% (39) of them disagreed that they designed our products for reuse, recycling, and recovery of material and component parts. The meanscorewas3.73, with a standard deviation of 1.14.

Lastly, on the statement that they design our products to avoid or reduce the use of hazardous products and their manufacturing process, 22.3% (40) of the participants strongly agreed. Also, 60.9% (109) of the respondents agreed while 16.8% (30) were neutral on the statement that they designed our products to avoid or reduce the use of hazardous products and their manufacturing process. The mean score of the survey question was 4.06, with a standard deviation of 0.62.

Finally, with a standard deviation of 0.74, the mean average score for the Eco Design survey items was 4.06. This indicated that most survey participants agreed with most of the poll's questions. To verify that the distribution was normal, the Kurtosis test was also performed. Kurtosis values varied from -1.307 to 1.702. Since all of the items' answer values fell within the permitted range of kurtosis values (-2 to +2), the distribution of those values was normal. The majority of the skewness statistics' values were negative, which suggests that the data set's mean and median were both smaller than its mode.

4.3.4 Green Distribution

The descriptive statistics on Green Distribution are presented in Table 4.5

Table 4. 5: Descriptive Statistics on Green Distribution

Green Distribution	SA	A	N	D	SD	Mean	Std Dev	Skewness	Kurtosis
	5	2	3	2	1				
The company uses alternative fuels	5.6 (10)	55.9 (100)	0 (0)	11.2 (20)	27.4 (49)	3.01	1.41	-0.490	-1.490
We cooperate with suppliers to standardize packaging	16.8 (30)	77.7 (139)	0 (0)	5.6 (10)	0 (0)	4.06	0.62	-1.438	1.679
The company Reduces the size of the packaging	5.6 (10)	55.3 (99)	22.3 (40)	11.2 (20)	5.6 (10)	3.44	0.96	-0.986	0.446
We Promote recycling and reuse programs among the employees	11.2 (20)	50.3 (90)	0 (0)	16.8 (30)	21.8 (39)	3.12	1.41	-0.452	-1.368
Average						3.41	1.1		

Source: Researcher (2024)

The descriptive statistics depicted in Table 4.5 indicate that 5.6% (10) of the respondents strongly agreed that the company uses alternative fuels and another 55.9% (100) agreed on the same. On the other hand, 11.2% (20) of the respondents agreed, and another 27.4% (49) strongly disagreed that the company uses alternative fuels, as supported by the mean score of 3.01 with a standard deviation of 1.41. However, 16.8% (30) of the respondents strongly agreed that they cooperate with suppliers to standardize packaging while 77.7% (139) agreed on the same assertion. Also, 5.6% (10) of the participants disagreed with the statement that they cooperate with suppliers to standardize packaging. The mean score of the survey question was 4.06 with a standard deviation of 0.62 and this signified that the majority of the respondents disagreed that they cooperate with suppliers to standardize packaging.

In regards to the company reducing the size of the packaging, 5.6% (10) of the respondents strongly agreed while 55.3% (99) agreed on the same assertion. Moreover, 22.3% (40) of the respondents were neutral, 11.2% (20) disagreed and 5.6% (10) strongly disagreed that the company reduces the size of the packaging, as supported by the mean score of 3.44 with a standard deviation of 0.96.

Lastly, 11.2% (20) of the respondents strongly agreed that they promote recycling and reuse programs among the employees while 50.3% (90) agreed on the same statement. On the other hand, 16.8% (30) of the participants disagreed and 21.8% (39) of them strongly disagreed that they promote recycling and reuse programs among the employees. The mean score was 3.12, with a standard deviation of 1.41.

Lastly, the Green Distribution survey's average mean score was 3.41, with a standard deviation of 1.1. This indicated that most respondents felt fairly strongly about most of the poll items. In addition, the distribution's normality was tested using the Kurtosis

test. Kurtosis scores varied from -1.490 to 1.866. Since the allowed range for kurtosis values is between -2 and +2, all of the items' response value distributions were normal. The data was skewed to the left, and the mean and median were both less than the data set's mode, according to the negative values of the skewness statistics.

4.3.5 Organization Culture

The descriptive statistics on organizational culture are presented in Table 4.6

Table 4. 6: Descriptive Statistics on Organization Culture

Organization Culture	SA 5	A 2	N 3	D 2	SD 1	Mean	Std Dev	Skewness	Kurtosis
We pursue goals and targets	44.7 (80)	27.9 (50)	0 (0)	5.6 (10)	21.8 (39)	3.68	1.60	-0.861	-0.952
We adhere to contractual obligations.	16.8 (30)	66.5 (119)	11.2 (20)	5.6 (10)	0 (0)	3.94	0.71	-0.877	1.460
We exhibit loyalty towards systems in the organization	38.5 (69)	55.9 (100)	0 (0)	5.6 (10)	0 (0)	4.27	0.73	-1.345	1.732
We only do what we are authorized to do.	38.5 (69)	44.7 (80)	11.2 (20)	5.6 (10)	0 (0)	4.16	0.84	-0.897	0.393
We adhere to procurement regulations to guide our activities and processes.	22.3 (40)	60.9 (109)	11.2 (20)	5.6 (10)	0 (0)	4.00	0.75	-0.810	0.999
We ensure documentation and information management.	33.5 (60)	60.9 (109)	0 (0)	5.6 (10)	0 (0)	4.22	0.72	-1.289	1.866
We encourage continuous improvement	60.9 (109)	33.5 (60)	0 (0)	5.6 (10)	0 (0)	4.50	0.77	-1.878	1.652
We recognize employee's contributions and suggestions	60.9 (109)	22.3 (40)	0 (0)	11.2 (20)	5.6 (10)	4.22	1.233	-1.515	0.967
Average						4.12	0.81		

Source: Researcher (2024)

The descriptive statistics depicted in Table 4.6 indicate that 44.7% (80) of the respondents strongly agreed that they pursue goals and targets and another 27.9% (50) agreed on the same. On the other hand, 5.6% (10) of the respondents disagreed, and another 21.8% (39) strongly disagreed that they pursue goals and targets, as supported by the mean score of 3.68 with a standard deviation of 1.60.

However, 16.8% (30) of the respondents strongly agreed that they adhere to contractual obligations while 66.5% (119) agreed on the same assertion. Also, 11.2% (20) of the participants were neutral, and 5.6% (10) disagreed that they adhere to contractual obligations. The mean score of the survey question was 3.94 with a standard deviation of 0.71 and this signified that the firm adhered to contractual obligations.

In regards to exhibiting loyalty towards systems in the organization, 38.5% (69) of the respondents strongly agreed while 55.9% (100) agreed on the same statement. Moreover, 5.6% (10) of the respondents disagreed that they exhibit loyalty towards systems in the organization, as supported by the mean score of 4.27 with a standard deviation of 0.73.

Nevertheless, 38.5% (69) of the respondents strongly agreed that they only do what they are authorized to do while 44.7% (80) agreed. On the other hand, 11.2% (20) of the participants were neutral and 5.6% (10) of them disagreed that they only do what they are authorized to do. The mean score was 4.16, with a standard deviation of 0.84.

On the statement that they adhere to procurement regulations to guide our activities and processes, 22.3% (40) strongly agreed, and 60.9% (109) agreed on the same assertion. Also, 11.2% (20) of the participants were neutral, while 5.6% (10) of the respondents disagreed that they adhere to procurement regulations to guide our activities and processes. The mean score of the survey question was 4.00, with a standard deviation of 0.75.

According to the findings in the table above, 33.5% (60) of the respondents agreed that they ensure documentation and information management while 60.9% (109) agreed. However, 5.6% (10) of the respondents disagreed that they ensure documentation and information management, as supported by the mean score of 4.22, with a standard deviation of 0.72.

The results revealed that 60.9% (109) of the participants strongly agreed while 33.5% (60) agreed that they encourage continuous improvement. Also, 5.6% (10) of the respondents disagreed that encourage continuous improvement. The mean score was 4.50, with a standard deviation of 0.77.

Lastly, 60.9% (109) of the participants strongly agreed that they recognize employee's contributions and suggestions, and another 22.3% (40) agreed with the same statement. Moreover, 11.2% (20) disagreed while 5.6% (10) of the participants strongly disagreed with the statement that they recognize employee's contributions and suggestions. The mean score was 4.22 with a standard deviation of 1.233.

With a standard deviation of 0.819, the mean average score for the Organization Culture survey questions was 4.12. This indicated that most survey participants agreed with most of the poll's questions. To verify that the distribution was normal, the Kurtosis test was also performed. Kurtosis scores varied from -0.952 to 1.732. Since all of the items' answer values fell within the permitted range of kurtosis values (-2 to +2), the distribution of those values was normal. The data was skewed to the left, as indicated by the negative values of the skewness statistics, and the data set's mean and median were both less than its mode.

4.3.6 Performance

The descriptive statistics on performance are summarized in Table 4.7

Table 4. 7: Descriptive Statistics on Performance

Performance	SA 5	A 2	N 3	D 2	SD 1	Mean	Std Dev	Skewness	Kurtosis
Our CO2 emission has been reduced after the introduction of green management.	33 (59)	44.7 (80)	16.8 (30)	5.6 (10)	0 (0)	4.05	0.85	-0.652	-0.141
Our waste water has been reduced after the introduction of green management.	0 (0)	72.1 (129)	22.3 (40)	5.6 (10)	0 (0)	3.66	0.58	-1.544	1.376
Our solid waste has been reduced after the introduction of green management.	33 (59)	44.7 (80)	11.2 (20)	11.2 (20)	0 (0)	3.99	0.95	-0.796	-0.165
Our energy consumption has been reduced after the introduction of green management.	16.8 (30)	77.7 (139)	0 (0)	5.6 (10)	0 (0)	4.06	0.62	-1.438	1.679
The quality of sugar has improved	39.1 (70)	49.7 (89)	5.6 (10)	5.6 (10)	0 (0)	4.22	0.79	-1.112	1.314
There are decreased inventory levels	38.5 (69)	33.5 (60)	22.3 (40)	5.6 (10)	0 (0)	4.05	0.91	-0.547	-0.703
On-time delivery of goods	22.3 (40)	60.9 (109)	16.8 (30)	0 (0)	0 (0)	4.06	0.62	-0.039	-0.414
There is a decreased manufacturing lead time	38.5 (69)	44.7 (80)	16.8 (30)	0 (0)	0 (0)	4.22	0.713	-0.345	-0.983
Average						4.04	0.754		

Source: Researcher (2024)

According to the descriptive data shown in Table 4.7, 33% (59) of the respondents strongly agreed and another 44.7% (80) agreed that the introduction of green management had reduced their CO₂ emissions. The mean score of 4.05 with a standard deviation of 0.85 indicates that, in contrast, 5.6% (10) of the respondents disagreed that their CO₂ emission had decreased since the adoption of green management, while 16.8% (30) were neutral.

Nonetheless, while 22.3% (40) of the respondents were undecided about the statement, 72.1% (129) of the respondents agreed that their wastewater had decreased since the implementation of green management. Furthermore, 5.6% (10) disapproved of the claim that the use of waste water has decreased since green management was implemented. The survey question had a mean score of 3.66 with a standard deviation of 0.58, indicating a decrease in solid waste following the implementation of green management.

33% (59) of the respondents strongly agreed that solid waste has decreased since the implementation of green management, and 44.7% (80) agreed with the same statement. Furthermore, as indicated by the mean score of 3.99 with a standard deviation of 0.95, 11.2% (20) of the respondents were neutral, and 11.2% (20) disagreed that their solid waste has decreased since the implementation of green management.

However, while 77.7% (139) of the respondents agreed, 16.8% (30) strongly agreed that their energy consumption has decreased since the implementation of green management. Conversely, 5.6% (10) of the participants had no opinion about the claim that the implementation of green management has resulted in a decrease in their energy usage. The standard deviation was 0.62 and the mean score was 4.06.

39.1% (70) strongly agreed with the statement that the quality of sugar has improved, and 49.7% (89) agreed. Furthermore, 5.6% (10) of the respondents disagreed that the quality of sugar has increased, whereas 5.6% (10) of the participants were neutral. The survey item had a mean score of 4.22 and a standard deviation of 0.79.

The results in the above table show that 33.5% (60) and 38.5% (69) of the respondents agreed that there is a decreasing inventory level. As seen by the mean score of 4.05 with a standard deviation of 0.91, 5.6% (10) of the respondents disagreed that there was a decline in inventory levels, while 22.3% (40) of the respondents were neutral.

The results revealed that 22.3% (40) of the participants strongly agreed while 60.9% (109) agreed that there is on-time delivery of goods. Also, 16.8% (30) of the respondents were neutral on the statement that there is on-time delivery of goods. The mean score was 4.06, with a standard deviation of 0.62.

Lastly, 38.5% (69) of the participants strongly agreed that there is decreased manufacturing lead time and another 44.7% (80) agreed with the same statement. Moreover, 16.8% (30) of the participants were neutral on the statement that there is decreased manufacturing lead time. The mean score was 4.22 with a standard deviation of 0.713.

To verify that the distribution was normal, the kurtosis test was also performed. The results showed a range of -0.983 to 1.679. The skewness statistics were negative, meaning that the data was skewed to the left and that the mean and median were both less than the mode of the data set. Celikoglu and Tirnakli (2018) state that values for kurtosis between -2 and +2 are considered acceptable. Therefore, the distribution of response values was normal for every item.

4.4 Validity Test

The study looked at the research instruments' construct validity as well as content. The techniques suggested by Cooper and Schindler (2014) were applied to attain content validity. Specifically, identifying the current scales from the literature, creating a data collection tool, and distributing it to specialists in pilot research. The survey form was modified in response to these experts to improve its clarity, comprehensiveness, relevance, significance, and necessary depth. The supervisors completed a final evaluation of the data-collecting tool, and the instrument was finalized thanks to their insightful suggestions. Additionally, the study examined the construct validity using the Sphericity test and Keyser Meyer Olkin (KMO). The test evaluated the sampling appropriateness of the entire model as well as individual variables. As a general rule, a statement is considered valid and measures what it claims to measure if the KMO value is greater than 0.4 and the P-value of sphericity is less than 0.05 (Rojas-Valverde, Pino-Ortega, Gómez-Carmona&Rico-González, 2020). Table 4.8 displays the validity results.

Table 4. 8: Construct Validity

Variable	Components Extracted	Highest Loading	KMO	Chi-Square	Sig.	Variance Explained
Green Procurement	2	0.855	0.574	423.507	0.000	65.56
Green Manufacturing	3	0.917	0.555	377.133	0.000	70.8
Eco Design	2	0.886	0.720	249.566	0.000	72.7
Green Distribution	2	0.936	0.538	220.188	0.000	82.0
Organization Culture	3	0.960	0.623	1885.054	0.000	90.3
Performance	2	0.944	0.624	1223.335	0.000	76.5

Source: Researcher (2024)

Results in Table 4.8 show that Green Procurement had a KMO value of 0.574 and Barlette's test of sphericity of $0.000 < 0.05$ and thus, the statements were valid/ measured what it purported to measure. Green Manufacturing had a KMO value of 0.555 and

Barlette's test of sphericity of $0.000 < 0.05$ and thus the statements were valid/it measured what it purported to measure. Eco Design had a KMO value of 0.720 and Barlette's test of sphericity of $0.000 < 0.05$ and thus, the statements were valid/it measured what it purported to measure. Green Distribution had a KMO value of 0.538 and Barlette's test of sphericity of $0.000 < 0.05$ and thus, the statements were valid, it measured what it purported to measure. The Organization Culture had a KMO value of 0.538 and Barlette's test of sphericity of $0.000 < 0.05$ and thus, the statements were valid, it measured what it purported to measure. Lastly, the performance had a KMO value of 0.623 and Barlette's test of sphericity of $0.000 < 0.05$, and thus the statements were valid, it measured what it purported to measure. In conclusion, all the variables met the minimum KMO value of 0.4 and Barlette's test of sphericity of < 0.05 and thus, they were valid.

4.5 Reliability Test

The degree to which an instrument measures consistently when employed in the same conditions with the same participants is known as reliability. The Cronbach's Alpha coefficients were used to determine the reliability of the research instruments for this study, and the results are shown in Table 4.9.

Table 4. 9: Reliability Results

Variable	Number of items	Cronbach alpha	Comments
Green Procurement	6	0.758	Reliable
Green Manufacturing	7	0.746	Reliable
Eco Design	5	0.784	Reliable
Green Distribution	4	0.782	Reliable
Organization Culture	8	0.785	Reliable
Performance	8	0.894	Reliable

Source: Researcher (2024)

According to Table 4.9's findings, the reliability of green procurement, green manufacturing, eco-design, green distribution, organization culture, and performance was demonstrated by Cronbach's alpha coefficients that were above 0.7. According to Taber (2018), the study's items' Cronbach's alpha values shouldn't be less than 0.7. Golafshani (2003) states that the Cronbach alpha should not be less than 0.7, however, Gliem and Gliem (2003) suggest that the Cronbach alpha should be greater than 0.7. As a result, the study's variables were deemed credible.

4.6 Correlation Analysis

The study employed correlation analysis to determine the relationship between green supply chain management practices and the performance of sugar production companies in Kenya. Between 0 and 1, the association of variables is established. When the correlation value is zero, there is no relationship between the variables. On the other hand, a perfect positive or negative relationship is shown by a correlation of ± 1.0 . Table 4.10 displays the correlation analysis results.

Table 4. 10: Correlation Analysis

Variable		Performance	GPP	GMP	ED	GD
Performance	Pearson correlation	1				
	Sig.(2-tailed)					
GPP: Green Procurement	Pearson correlation	.493**	1			
	Sig.(2-tailed)	0.000				
GM: Green Manufacturing	Pearson correlation	.544**	.436**	1		
	Sig.(2-tailed)	0.119	0.000			
ED: Eco Design	Pearson Correlation	.572**	.400**	.509**	1	
	Sig.(2-tailed)	0.000	0.002	0.000		
GD: Green Distribution	Pearson correlation	.608**	.407**	.556**	.512**	1
	Sig.(2-tailed)	0.000	0.892	0.000	0.000	
OC: Organization Culture	Pearson correlation	.555**	.375**	.329**	.339**	.475**
	Sig. (2-tailed)	0.000	0.000	0.001	0.000	0.000

Source: Researcher (2024)

The results from Table 4.10 show significant positive correlations between performance and all four GSCM strategies as well as organizational culture, suggesting that these factors positively influence the performance of sugar companies in Western Kenya. The Pearson correlation coefficient between green procurement and performance is .493, with a p-value of 0.000, indicating a strong and significant positive relationship. This suggests that implementing green procurement practices can lead to improved performance. Chiarini and Vagnoni (2018) support this by noting that green procurement can result in cost savings and resource efficiency, thus enhancing financial performance. The correlation between green manufacturing and performance is .544, also significant with a p-value of 0.000. This indicates that green manufacturing practices positively affect performance, likely through reduced energy consumption

and better resource utilization, as found by Wang, Geng, and Wang (2018). These practices not only enhance profitability but also offer a competitive advantage. Eco-design shows a correlation of .572 with performance, with a p-value of 0.000, indicating a strong and significant positive impact. Eco-design helps optimize material and energy use throughout the product lifecycle, leading to cost savings and improved profitability (Ormazabal, Prieto-Sandoval, Jaca, & Santos, 2018). Additionally, eco-design meets consumer demand for sustainable products; enhancing market competitiveness (Choi & Ng, 2018). The highest correlation is between green distribution and performance at .608, with a p-value of 0.000, showing a very strong and significant relationship. Green distribution optimizes logistics and reduces waste, significantly lowering transportation costs and improving financial performance (Paulraj, Chen, & Blome, 2019). Furthermore, it enhances customer satisfaction and loyalty by appealing to environmentally conscious consumers (Wu & Pagell, 2018). Organizational culture has a significant positive correlation with performance (.555, $p=0.000$). A strong organizational culture can boost employee engagement and satisfaction, leading to higher productivity and reduced turnover (Katou & Budhwar, 2019). This fosters a supportive environment for implementing green practices, thereby enhancing overall performance.

4.7 Diagnostic Tests

To make sure that the assumptions of the linear regression model are not being broken, some diagnostic tests are carried out before model estimation. As a result, there was less chance of getting skewed, ineffective, and inconsistent parameter estimations.

4.7.1 Normality Test

The Shapiro-Wilk test was used in the study to check for normalcy. We apply the

Shapiro-Wilk test for data sets with fewer than 2000 items; for larger data sets, we apply the Kolmogorov-Smirnov test. A 95% confidence level p-value of greater than 0.05 indicates that the data is normal. We conclude that the data is normally distributed if that is the case. Table 4.11 displays the results of the normalcy test.

Table 4. 11: Normality Test

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	Df	Sig.
Green Procurement	.229	179	.543	.775	179	.507
Green Manufacturing	.179	179	.234	.926	179	.298
Eco Design	.153	179	.312	.952	179	.349
Green Distribution	.211	179	.125	.899	179	.109
Green Procurement	.307	179	.089	.938	179	.074
Performance	.250	179	.498	.801	179	.423

a. Lilliefors Significance Correction

Source: Researcher (2024)

Table 4.11 shows that the data is normally distributed as the respective p values for all variables more than 0.05. Thus, it is concluded the data is normally distributed.

4.7.2 Multicollinearity Test

To ascertain if the independent variables in the study had a strong correlation or not, the multicollinearity test was looked at. Table 4.12 presents the results of the multicollinearity test.

Table 4. 12: Multicollinearity Test

Variable	Tolerance	VIF
Green Procurement	.764	1.308
Green Manufacturing	.642	1.557
Eco Design	.698	1.433
Green Distribution	.607	1.647
Organization Culture	.785	1.274

Source: Researcher (2024)

Table 4.12's findings show that there is no multicollinearity because each variable's VIF is less than 10. As to Katrutsa and Strijov (2017), multicollinearity is present when the VIF value is greater than 10. The standard errors and confidence intervals are inflated by multicollinearity, which results in estimations of the coefficients for individual predictors that are unstable.

4.7.3 Linearity Test

A straight-line relationship between the predictor and dependent variables is assumed by linearity. A scatter plot of all the independent factors versus the dependent variable was used to evaluate the linearity test and determine whether a straight-line connection existed. The linearity tests are shown in Figures 4.1.4.2, 4.3, 4.4, and 4.5.

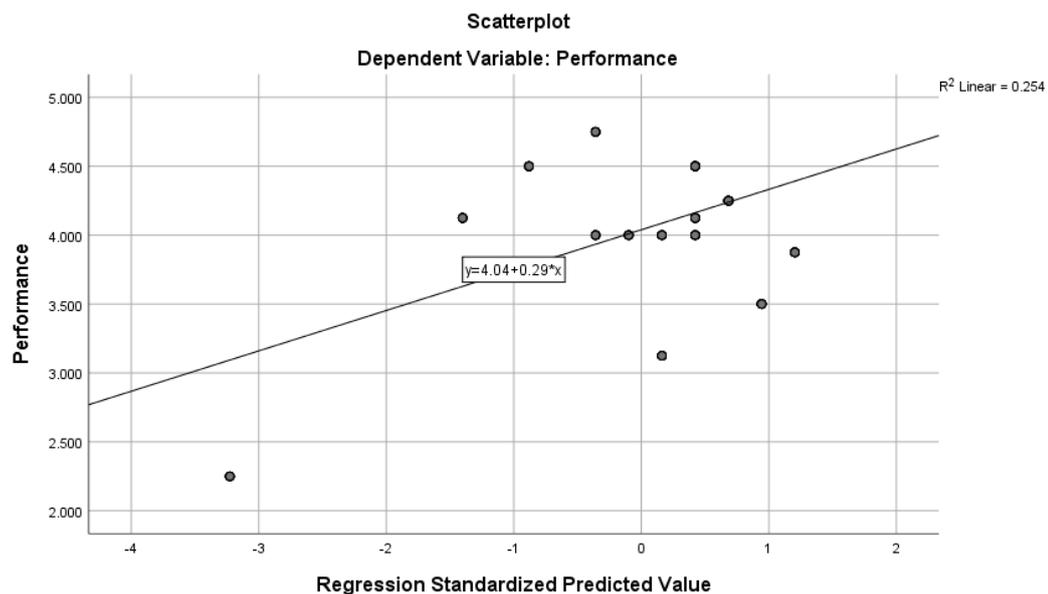


Figure 4. 1: Scatter Plot of Green Procurement against Performance

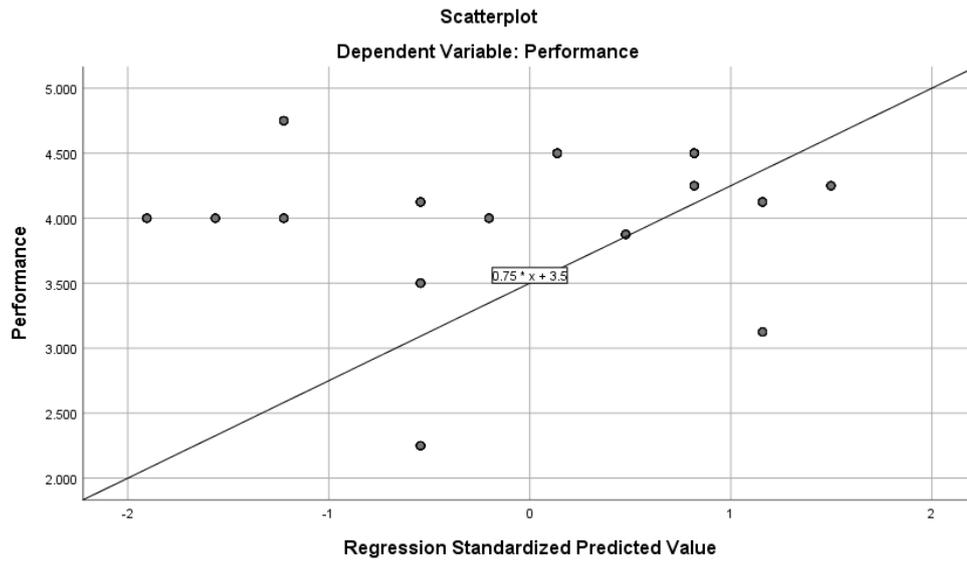


Figure 4. 2: Scatter Plot of Green Manufacturing against Performance

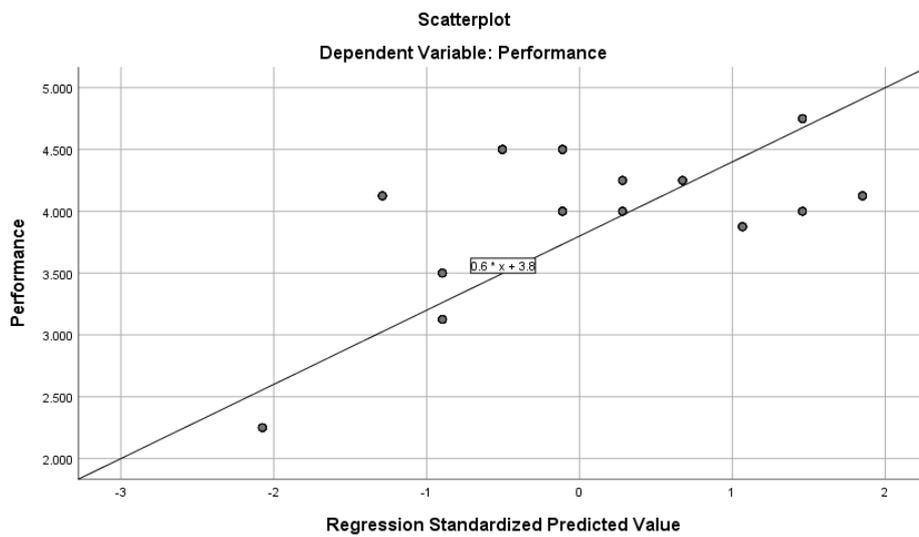


Figure 4. 3: Scatter Plot of Eco Design against Performance

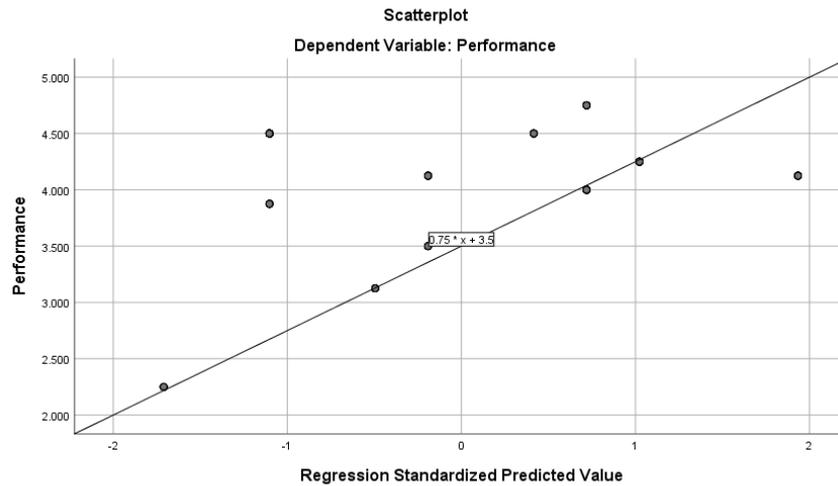


Figure 4. 4: Scatter Plot of Green Distribution against Performance

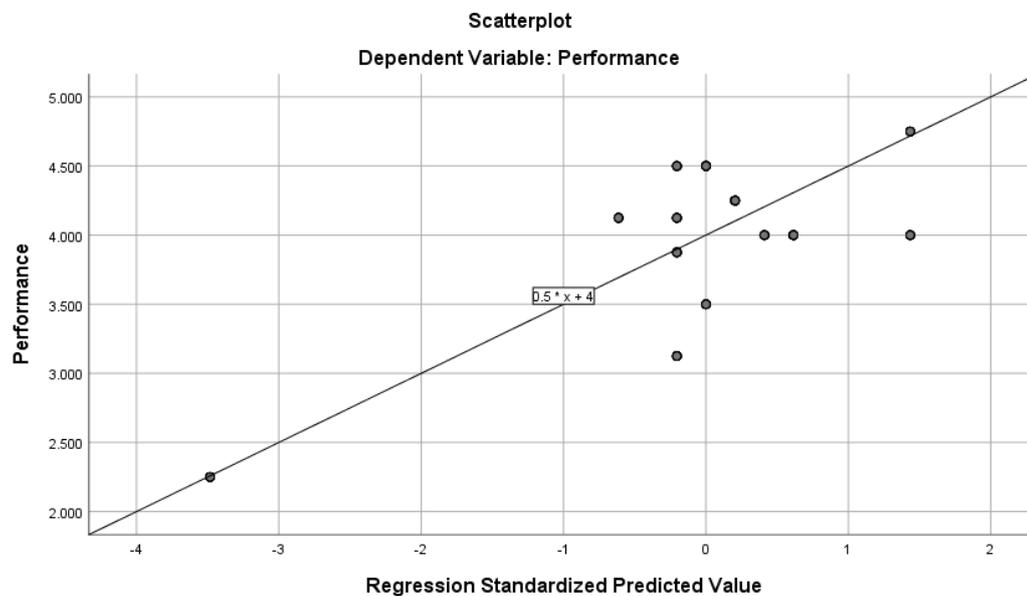


Figure 4. 5: Scatter Plot of Organization Culture against Performance

Figures 4.1, 4.2, 4.3, 4.4, and 4.5 illustrate the straight-line relationship between the independent variables (Green Procurement, Green Manufacturing, Eco Design, Green Distribution, and Organization Culture) and the dependent variable (performance). The percentage of the dependent variable variance that a linear model explains was displayed by the R-squared.

4.7.4 Heteroscedasticity test

The Breusch-Pagan / Cook-Weisberg test was used to do a heteroscedasticity test to determine whether the error terms in the cross-sectional data set are correlated among observations. The null hypothesis is rejected if the p-value is less than 0.05. The outcomes are displayed in Table 4.13.

Table 4. 13: Heteroscedasticity Results

Modified Breusch-Pagan Test for Heteroskedasticity^{a, b, c}		
Chi-Square	Df	Sig.
.050	1	.822
a. Dependent variable: Performance		
b. Tests the null hypothesis that the variance of the errors does not depend on the values of the independent variables.		
c. Predicted values from design: Intercept + GPP + GM + ED + GD + GPP * GM + GPP * ED + GPP * GD + GM * ED + GM * GD + ED * GD + GPP * GM * ED + GPP * GM * GD + GPP * ED * GD + GM * ED * GD + GPP * GM * ED * GD		

Source: Researcher (2024)

Table 4.13's results indicate that the p-value is higher than 0.05. Since the reported result is $0.322 > 0.05$, the null hypothesis is not rejected at a crucial p-value of 0.05. This means that there was no heteroscedasticity in the data.

4.8 Regression Analysis

The relationship between variables is examined using regression analysis. It is a collection of statistical techniques for calculating the correlations between one or more independent variables and a dependent variable. Regression coefficients, analysis of variance, and model fitness are the elements that make up a regression analysis.

4.8.1 Regression Analysis

The model fitness results are presented in Table 4.14

Table 4. 14: Model Fitness

Model	R	RSquare	AdjustedRSquare	St. Error of the Estimate
1	.741 ^a	.549	.538	.35915851

Source: Researcher (2024)

The results presented in Table 4.14 indicate that Green Distribution, Green Procurement, Green Manufacturing, and Eco Design are adequate variables in explaining performance. This is supported by the coefficient of determination also known as the R square of 0.549. This means that Green Distribution, Green Procurement, Green Manufacturing, and Eco Design explain 54.9% of the variations in the performance (dependent variable) in sugar companies in western Kenya. Table 4.15 provides the results of the analysis of variance (ANOVA).

Table 4. 15: ANOVA

Model	Sum of Squares	Df	Mean Square	F	Sig.	
1	Regression	27.289	4	6.822	52.888	.000 ^b
	Residual	22.445	174	.129		
	Total	49.734	178			

a. Dependent Variable: Performance

b. Predictors: (Constant), Green Distribution, Green Procurement, Green Manufacturing, Eco Design

Source: Researcher (2024)

The model as a whole is statistically significant, according to Table 4.15's findings. According to the findings, eco-design, green distribution, green procurement, and green manufacturing are all reliable indicators of performance. The stated p-value of 0.000, which is less than the typical probability of 0.05 significance level, and an F statistic of 52.888 support this. Additionally, the study looked at the regression coefficients; the findings are shown in Table 4.16.

Hypothesis 1 (H_{01}) stated that green procurement has no significant effect on the performance of sugar companies in western Kenya. The findings in Table 4.16 indicate that green procurement had a positive and significant impact on the performance of sugar companies in western Kenya ($\beta_1 = 0.264, p < 0.05$): hence H_{01} is rejected and it is concluded that green procurement has a significant influence on the performance of sugar companies in western Kenya. Empirically, a unit increase in green procurement led to a 0.264 unit increase in performance. The findings are supported by empirical literature done by Chiarini and Vagnoni (2018); Kuei et al., (2019).

According to Chiarini and Vagnoni (2018), organizations that implement green procurement practices can achieve significant cost savings by minimizing waste and enhancing resource efficiency. By adopting environmentally friendly materials and processes, companies can reduce their dependency on non-renewable resources and lower their operational costs, which directly contribute to improved financial performance.

Kuei, Chou & Madu (2019) found that consumers and stakeholders are increasingly favoring companies that demonstrate a commitment to sustainability. This shift in consumer preferences means that companies practicing green procurement can enhance their market position and attract a more loyal customer base, leading to increased sales and market share.

Employee satisfaction and retention are also positively impacted by green procurement. As organizations become more environmentally conscious, they often foster a culture of sustainability that resonates with employees. A study by Ojo, Fauzi, and Ramin (2018) highlighted that employees are more motivated and engaged in workplaces that prioritize sustainable practices. This heightened employee engagement can lead to

improved productivity and lower turnover rates, further contributing to the overall performance of the organization.

Regulatory compliance and risk management are significant factors driving the positive impact of green procurement. Governments and regulatory bodies worldwide are implementing stricter environmental regulations, and companies that proactively adopt green procurement are better positioned to comply with these regulations, thereby avoiding penalties and legal issues. As noted by Walker, Di Sisto, and McBain (2019), companies that align their procurement strategies with environmental regulations can mitigate risks associated with non-compliance and enhance their long-term viability.

Hypothesis 2 (H_{02}) stated that green manufacturing has no significant effect on the performance of sugar companies in western Kenya. The findings in Table 4.16 indicate that green manufacturing had a positive and significant impact on the performance of sugar companies in western Kenya ($\beta_1 = 0.182, p < 0.05$): hence H_{02} is rejected and it is concluded that green manufacturing has a significant influence on the performance of sugar companies in western Kenya. Empirically, a unit increase in green manufacturing led to a 0.182 unit increase in performance. The findings are supported by empirical literature done by Wang, Geng, and Wang (2018); Longoni, Golini, and Cagliano (2018).

A study by Wang, Geng, and Wang (2018) revealed that companies implementing green manufacturing practices experienced substantial cost savings due to decreased energy consumption and improved resource utilization. This not only enhances profitability but also provides a competitive edge in the market.

Green manufacturing can lead to improved product quality and innovation. Companies that prioritize sustainability are often driven to innovate, leading to the development of

superior products that meet the growing consumer demand for environmentally friendly goods. A study by Chiou, Chan, Lettice, and Chung (2018) highlighted that green manufacturing practices encourage innovation, resulting in products that are not only sustainable but also of higher quality. This improvement in product offerings can enhance customer satisfaction and loyalty, thereby boosting sales and market share.

Employee engagement and satisfaction also see positive impacts from green manufacturing practices. Organizations that commit to sustainability create a work environment that aligns with the values of many employees, fostering a feeling of pride and motivation. As noted by Longoni, Golini, and Cagliano (2018), employees are most likely to be engaged and productive when they work for environmentally responsible companies. This increased engagement can lead to higher productivity and lower turnover rates, contributing to overall organizational performance.

Green manufacturing helps companies to comply with environmental regulations and avoid associated penalties. As governments worldwide continue to enforce stricter environmental laws, companies that proactively adopt green practices are better positioned to meet these requirements. A study by Azevedo, Brandenburg, and Carvalho (2019) found that firms engaged in green manufacturing were less likely to face regulatory fines and more likely to receive positive recognition from regulatory bodies. This compliance not only protects the company from financial penalties but also enhances its reputation and legitimacy in the market.

Hypothesis 3 (H_{03}) stated that eco-design has no significant effect on the performance of sugar companies in western Kenya. The findings in Table 4.16 indicate that eco-design had a positive and significant impact on the performance of sugar companies in western Kenya ($\beta_1 = 0.295, p < 0.05$): hence H_{03} is rejected and it is concluded that

eco-design has a significant influence on the performance of sugar companies in western Kenya. Empirically, a unit increase in eco-design led to a 0.295 unit increase in performance. The findings are supported by empirical literature done by Choi and Ng (2018); and Dangelico, Pujari, and Pontrandolfo (2019).

By optimizing the use of materials and energy throughout the product lifecycle, companies can achieve substantial savings. A study by Ormazabal, Prieto-Sandoval, Jaca, and Santos (2018) found that companies adopting eco-design practices experienced lower production costs due to the efficient use of resources and reduction in waste generation. These cost savings contribute directly to improved profitability and financial performance.

Eco-design also enhances market competitiveness by meeting the increasing consumer demand for sustainable products. Consumers today are more environmentally conscious and prefer products that have a minimal ecological footprint. According to a study by Choi and Ng (2018), companies that implement eco-design can differentiate themselves in the market, attracting environmentally aware customers and gaining a competitive edge. This differentiation can lead to increased market share and revenue growth.

Eco-design fosters innovation by encouraging companies to develop new and improved products that are both environmentally friendly and high-quality. The need to consider environmental impacts during the design phase often leads to creative solutions and technological advancements. For instance, a study by Dangelico, Pujari, and Pontrandolfo (2019) showed that eco-design initiatives stimulate innovation, resulting in products that not only reduce environmental harm but also offer superior

performance and functionality. This innovation improves a company's reputation and brand value.

Eco-design helps companies comply with environmental regulations and standards, thereby avoiding potential legal issues and fines. As regulatory frameworks become more stringent worldwide, companies that proactively adopt eco-design are better positioned to meet these requirements. According to a study by Micheli, Cagno, and Zorzini (2018), firms that integrate eco-design into their processes are more likely to comply with environmental legislation, reducing the risk of penalties and enhancing their legal standing. This compliance not only protects the company from financial losses but also strengthens its market position by demonstrating corporate responsibility.

Eco-design can improve stakeholder relationships, including those with investors, customers, and employees. Companies that commit to sustainability through eco-design often build stronger trust and loyalty among stakeholders. A study by Testa, Iraldo, and Frey (2018) highlighted that eco-design practices positively influence stakeholder perceptions, leading to enhanced corporate reputation and increased investor confidence. This improved stakeholder engagement enhances better financial performance and long-term sustainability.

Hypothesis 4 (H_{04}) stated that green distribution has no significant effect on the performance of sugar companies in western Kenya. The findings in Table 4.16 indicate that green distribution had a positive and significant impact on the performance of sugar companies in western Kenya ($\beta_1 = 0.364, p < 0.05$): hence H_{04} is rejected and it is concluded that green distribution has a significant influence on the performance of sugar companies in western Kenya. Empirically, a unit increase in green distribution

led to a 0.364 unit increase in performance. The findings are supported by empirical literature done by Paulraj, Chen, and Blome (2019); and Wu and Pagell (2018).

Green distribution contributes to cost efficiency by optimizing logistics and reducing waste. According to a study by Paulraj, Chen, and Blome (2019), companies that implement green distribution practices, such as route optimization and the use of energy-efficient transportation modes, can significantly reduce fuel consumption and transportation costs. These cost savings directly improve the financial performance of the organization, allowing resources to be allocated to other strategic areas.

Green distribution enhances customer satisfaction and loyalty. Buyers are increasingly aware of the environmental impact of their purchases and prefer companies that demonstrate a commitment to sustainability. A study by Wu and Pagell (2018) found that companies adopting green distribution operations, for example using recyclable packaging and reducing carbon emissions, reported higher levels of customer satisfaction. This increased customer loyalty can lead to greater market share and long-term profitability.

Regulatory compliance is another critical benefit of green distribution. Governments and regulatory bodies are imposing stricter environmental regulations on companies, particularly in the logistics and distribution sectors. Companies that proactively adopt green distribution practices are better positioned to comply with these regulations and avoid potential fines and penalties. According to research by Gonzalez-Benito and Gonzalez-Benito (2018), firms that integrate green distribution into their operations are more likely to meet regulatory requirements, enhancing their legal standing and reducing the risk of financial losses associated with non-compliance.

Green distribution also contributes to overall sustainability, which can improve an organization's reputation and attract environmentally conscious investors. A study by Zhu, Sarkis, and Lai (2019) highlighted that companies implementing green distribution practices are perceived as more sustainable and responsible, which can enhance their corporate reputation and brand value. This improved perception can attract investments from stakeholders who prioritize environmental, social, and governance (ESG) criteria, further boosting the company's financial performance.

Green distribution fosters innovation within the organization. The need to reduce environmental impact encourages companies to develop new technologies and processes that are both efficient and sustainable. For example, the adoption of electric vehicles and alternative fuels in distribution fleets represents innovative solutions that can reduce carbon footprints and improve operational efficiency. According to the study by Yadav, Singh, and Kumar (2018), such innovations not only reduce environmental impact but also drive operational efficiencies, leading to better overall performance.

Table 4. 16: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.553	.318		-1.741	.083
	Green Procurement	.264	.069	.218	3.803	.000
	Green Manufacturing	.182	.068	.169	2.655	.009
	Eco Design	.295	.066	.270	4.441	.000
	Green Distribution	.364	.071	.321	5.119	.000

a. Dependent Variable: Performance

Source: Researcher (2024)

4.8.2 Testing the Effect of Organizational Culture

As recommended by Baron and Kenny (1986), the study looked at the moderator's impact on the outcome variable after assessing the impact of the independent factors. Table 4.17 presents the results, which demonstrate that organizational culture has a significant and beneficial impact on the performance of sugar enterprises located in western Kenya ($\beta = 0.305$, $p < 0.05$).

According to a study by Chiarini, Belvedere, and Grando (2018), organizations that adopt clear and efficient organizational structures can streamline processes, reduce redundancies, and improve decision-making. This leads to faster response times and better resource allocation, which ultimately enhances overall performance. Efficient organizational structures enable companies to be more agile and responsive to market changes, giving them a competitive edge.

Employee engagement is another critical factor positively influenced by organizational practices. A study by Katou and Budhwar (2019) found that organizations with effective human resource management practices, such as continuous training and development, clear communication channels, and employee recognition programs, reported higher levels of employee engagement and satisfaction. Engaged employees are more productive, exhibit higher levels of creativity, and are more committed to their organization's goals. This boost in employee morale directly translates to improved organizational performance.

Innovation is also fostered by effective organizational practices. Organizations that encourage a culture of innovation, where employees are empowered to experiment and take calculated risks, tend to perform better. According to research by Birkinshaw, Zimmerman, and Raisch (2018), companies that promote cross-functional collaboration

and provide the necessary resources for innovation see significant improvements in their performance metrics. Innovative practices can lead to the development of new products and services, improved processes, and the ability to better meet customer needs.

Strategic alignment within an organization is crucial for achieving high performance. When an organization's goals and strategies are well-aligned with its structure and processes, the organization is more likely to achieve its objectives. A study by Sabherwal and Becerra-Fernandez (2019) emphasized that organizations with well-aligned strategies and structures could better execute their plans and achieve desired outcomes. This alignment ensures that all parts of the organization are working towards common goals, minimizing conflicts, and enhancing overall performance.

Effective leadership plays a pivotal role in enhancing organizational performance. Leaders who can inspire, motivate, and guide their teams toward achieving the organization's vision create a positive work environment that fosters high performance. A study by Northouse (2018) highlighted that transformational leadership, which focuses on inspiring and motivating employees, is particularly effective in improving organizational performance. Transformational leaders encourage innovation, build trust, and create a sense of ownership among employees, leading to better organizational outcomes.

Organizational culture significantly impacts performance. A positive organizational culture that values collaboration, transparency, and continuous improvement can lead to better performance outcomes. According to a study by Schein and Schein (2018), organizations that cultivate a strong and positive culture are more likely to see high levels of employee engagement, customer satisfaction, and overall organizational

success. A positive culture supports the effective implementation of strategies and enhances the organization's ability to adapt to changes in the external environment.

Table 4. 17: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.785 ^a	.616	.605	.332352752380785

a. Predictors: (Constant), OC, GM, GP, ED, GD

Source: Researcher (2024)

The coefficient of determination, or the degree to which the model can be utilized to predict changes in the dependent variable, is calculated using R square. Since the regression model only accounts for 61.6% of the performance changes, it is deemed strong. The fact that the model could account for 61.6% suggests that the bulk of the factors influencing performance were included in the model.

Table 4. 18: ANOVA Statistics

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	30.625	5	6.125	55.450	.000 ^b
	Residual	19.109	173	.110		
	Total	49.734	178			

a. Dependent Variable: PER

b. Predictors: (Constant), OC, GM, GP, ED, GD

Source: Researcher (2024)

Table 4. 19: Moderation results

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	-.878	.300		-2.929	.004
GP	.197	.065	.162	3.012	.003
GM	.181	.063	.169	2.867	.005
ED	.277	.062	.253	4.493	.000
GD	.256	.069	.225	3.720	.000
OC	.305	.056	.292	5.495	.000

Dependent Variable: PER

Source: Researcher (2024)

4.8.3 Testing for the moderating effect of Organizational Culture

It is necessary to introduce interacting terms for each of the independent variables and assess if they have a statistically significant impact on performance to establish the moderating effect of organizational culture. Multiplying each independent variable by the organizational culture yields the interaction term. The coefficients of each independent variable, including the interacting terms, are shown in Table 4.20.

Model 3 to Model 6 interaction terms were entered. The relationship between organizational culture and perceived green procurement was entered as GP*OC in model 3. The total R² is 67.1%, representing a 5.5% Δ R². There appears to be moderation because the beta coefficient is statistically significant and nonzero. Model 4 includes the interaction term "green manufacturing and organization culture" (GM*OC). According to the table below, the total R² is 2.7% Δ R², or 69.8%. The interaction term's beta coefficient is noticeably positive, suggesting the presence of a moderating impact. Model 5 contains the third interaction term between organization culture and eco-design (EC *OC). Performance is statistically positively impacted by the interaction term. The model's total explanatory power is 71.4% and 1.6% Δ R², as indicated in the table below. These findings show that a moderating impact exists.

Lastly, model 6 includes the green distribution and organization culture (GD*OC) interaction term. The model explains 72.3% of the variation in performance, according to the regression results, whereas the R² changes by 0.9%. Moderation is further shown by the interaction term's beta coefficient. The results of model 6, which includes every predictor variable, moderator, and interaction term as indicated in the table, were used in the study to evaluate the moderating hypotheses. The following is the interpretation of the test findings for the hypothesis.

H_{05a}: Organizational culture does not moderate the relationship between green procurement and the performance of sugar companies in western Kenya.

The findings of the study revealed that the beta coefficient of the interaction term of green procurement and organizational culture had a negative and significant effect on performance ($\beta = -0.292$, $p < 0.05$). Therefore, the null hypothesis was rejected and the study concluded that organizational culture moderates the relationship between green procurement and the performance of sugar companies in western Kenya. The moderating effect of organizational culture is further shown by the aid of a mod graph Figure 4.6. The mod graph shows that performance is high with high green procurement and low organizational culture.

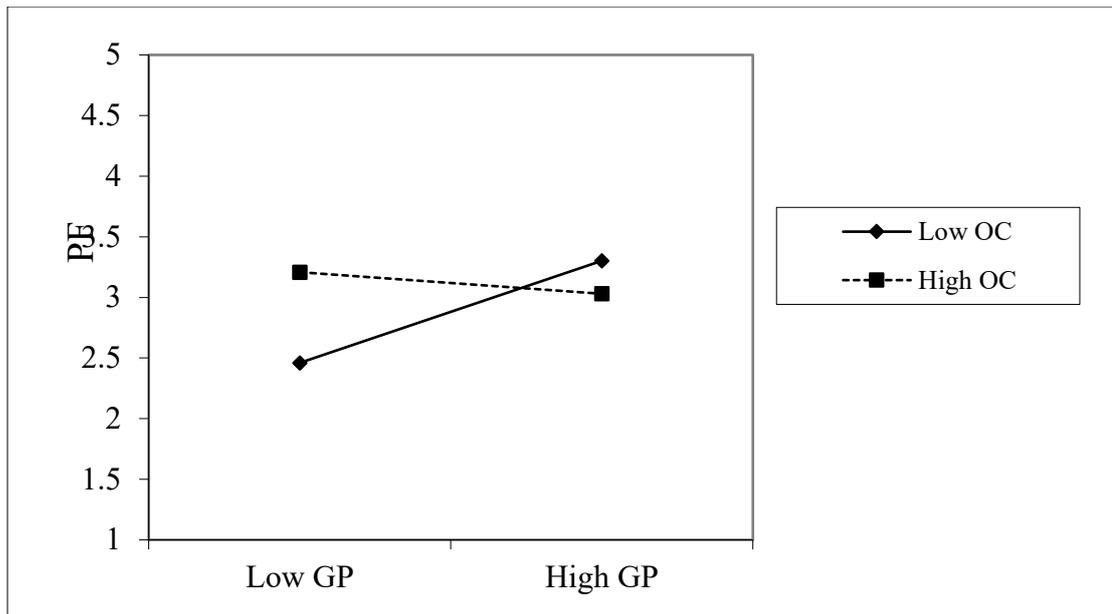


Figure 4. 6 Mod graph for organizational culture on GP and PF

H_{05b}: Organizational culture does not moderate the relationship between green manufacturing and the performance of sugar companies in western Kenya.

The findings of the study revealed that the beta coefficient of the interaction term of green manufacturing and organizational culture had a negative and significant effect on performance ($\beta = -0.227$, $p < 0.05$). Therefore, the null hypothesis was rejected and the study concluded that organizational culture moderates the relationship between green manufacturing and the performance of sugar companies in western Kenya. The moderating effect of organizational culture is further shown by the aid of a mod graph Figure 4.7. The mod graph shows that performance with high green manufacturing and low organizational culture.

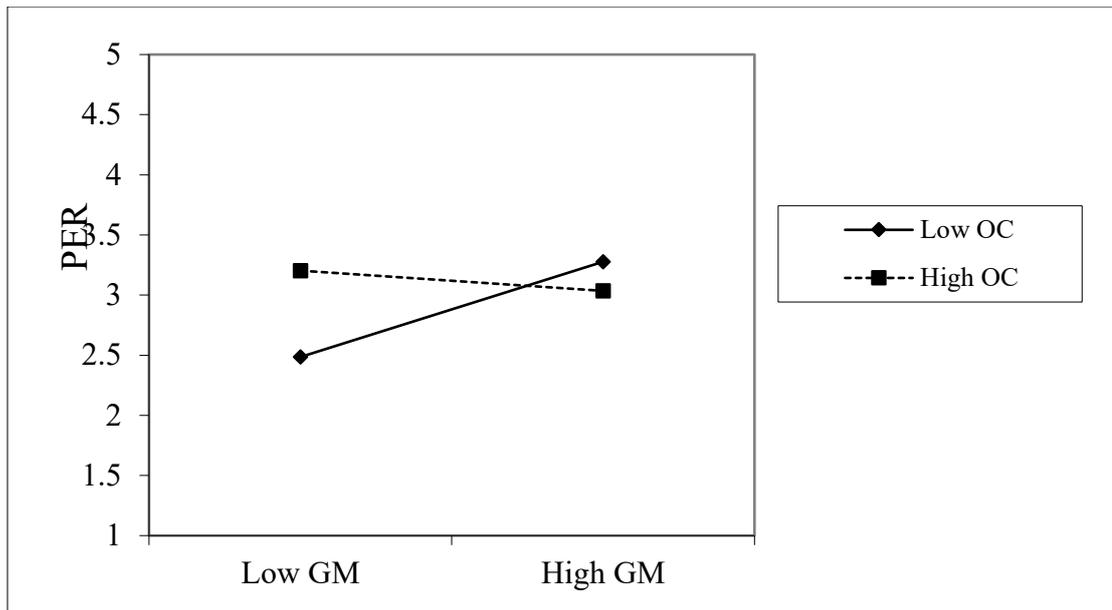


Figure 4. 7: Mod graph for organizational culture on GM and PF

H_{05c}: Organizational culture does not moderate the relationship between eco-design and the performance of sugar companies in western Kenya.

The findings of the study revealed that the beta coefficient of the interaction term of eco-design and organizational culture had a negative and significant effect on performance ($\beta = -0.285$, $p < 0.05$). Therefore, the null hypothesis was rejected and the study concluded that organizational culture moderates the relationship between eco-design and performance of sugar companies in western Kenya. The moderating effect of organizational culture is further shown by the aid of a mod graph Figure 4.8. The mod graph shows that performance is high with high eco-design and low organizational culture.

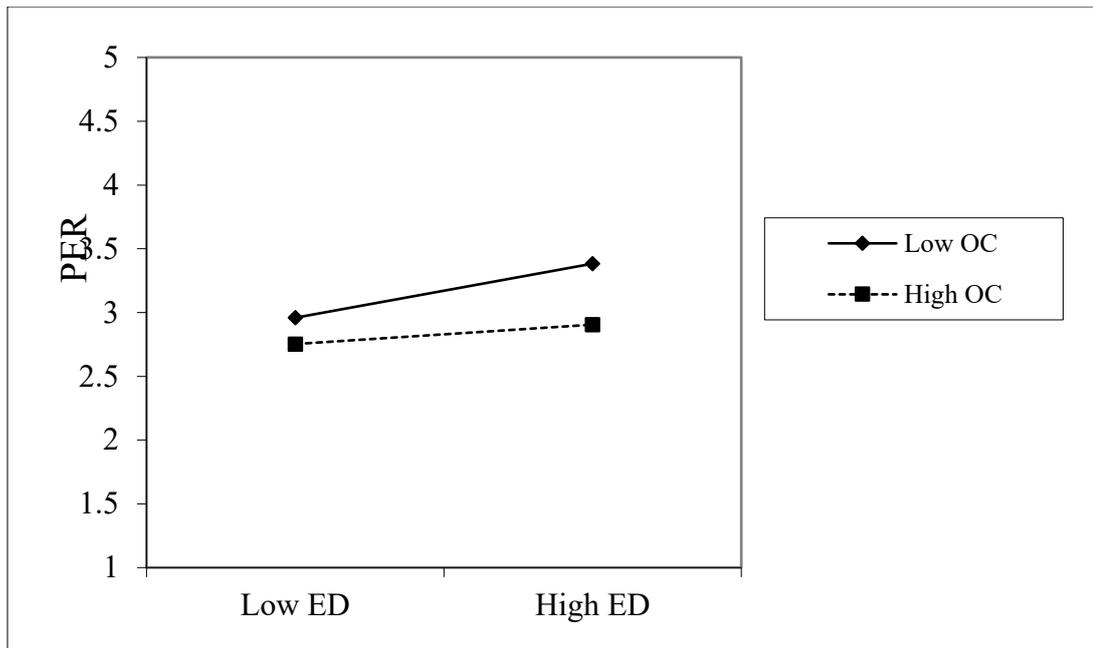


Figure 4. 8: Mod graph for organizational culture on ED and PF

H_{05c}: Organizational culture does not moderate the relationship between green distribution and the performance of sugar companies in western Kenya.

The study's conclusions showed that performance was significantly impacted negatively by the beta coefficient of the interaction term between organizational culture and green distribution ($\beta = -0.270$, $p < 0.05$). The study concluded that organizational culture moderates the relationship between green distribution and the performance of sugar firms in western Kenya, hence rejecting the null hypothesis. A mod graph, as seen in Figure 4.9, helps to further illustrate the moderating effect of organizational culture. The mod graph demonstrates that low organizational culture and high green distribution correspond to high performance.

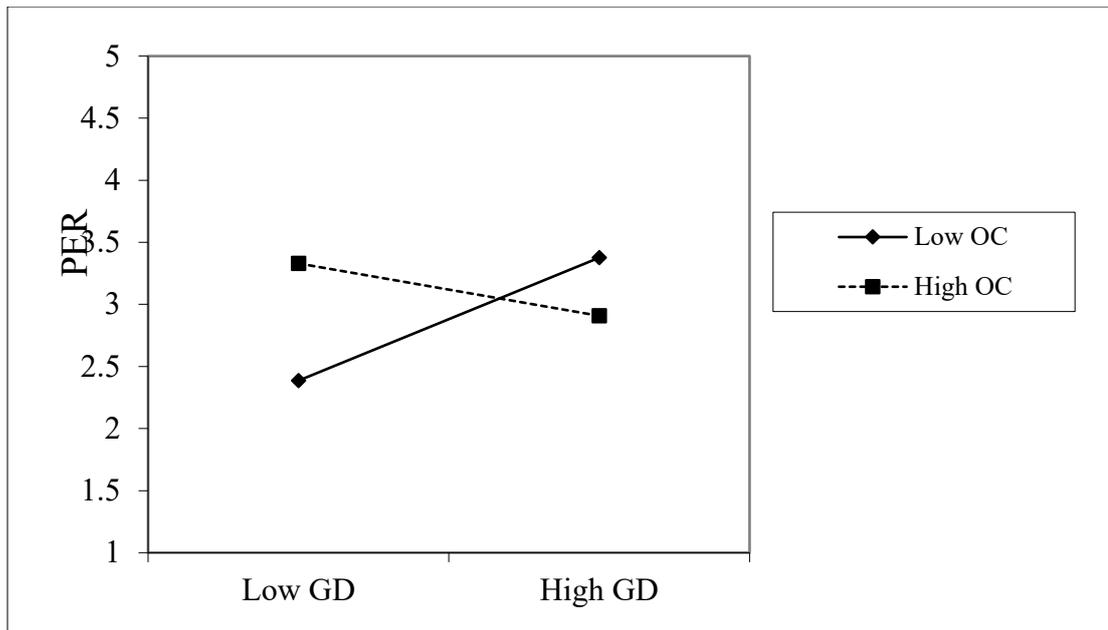


Figure 4. 9: Mod graph for organizational culture on GD and PF

Table 4. 20: Moderating Effect of Organizational Culture on the Relationship between Green Supply Chain Management Strategies and Performance

Variables	Model 1 B (StdError)	Model 2 B (StdError)	Model 3 B (StdError)	Model 4 B (StdError)	Model 5 B (StdError)	Model 6 B (StdError)
Predictors						
(Constant)	-0.553 (0.318) **	-0.878 (0.300) **	-0.157 (0.339) **	-0.548 (0.340) **	-0.637 (0.333) **	-0.794 (0.336) **
Green Procurement	0.264 (0.069) **	0.197 (0.065) **	0.203 (0.061) **	0.169 (0.059) **	0.170 (0.057) **	0.154 (0.057) **
Green Manufacturing	0.182 (0.068) **	0.181 (0.063) **	0.139 (0.059) **	0.146 (0.057) **	0.120 (0.056) **	0.116 (0.056) **
Eco Design	0.295 (0.066) **	0.277 (0.062) **	0.174 (0.060) **	0.146 (0.058) **	0.161 (0.057) **	0.160 (0.056) **
Green Distribution	0.364 (0.071) **	0.256 (0.069) **	0.202 (0.065) **	0.190 (0.062) **	0.175 (0.061) **	0.176 (0.060) **
Organization Culture		0.305 (0.056) **	0.231 (0.053) **	0.194 (0.052) **	0.194 (0.051) **	0.174 (0.051) **
Interactions						
Green Procurement* Organization Culture			-0.454 (0.085) **	-0.335 (0.087) **	-0.310 (0.085) **	-0.292 (0.085) **
Green Manufacturing* Organization Culture				-0.309 (0.078) **	-0.246 (0.079) **	-0.227 (0.078) **
Eco Design* Organization Culture					-0.264 (0.086) **	-0.285 (0.085) **
Green Distribution * Organization Culture						-0.270 (0.115) **
Models Summary Statistics						
R	.741 ^a	.785 ^b	.819 ^c	.836 ^d	.845 ^e	.850 ^f
R Square	0.549	0.616	0.671	0.698	0.714	0.723
Adjusted R Square	0.538	0.605	0.659	0.686	0.701	0.708
Std. Error of the Est	0.3592	0.3323	0.3086	0.2962	0.2892	0.2854
R square change	-	0.067	0.055	0.027	0.016	0.022

Source: Researcher (2024)

Table 4. 21:Summary of Hypotheses Testing

Hypothesis	Test	Decision and Conclusion
H₀₁ : Green procurement has no significant effect on the performance of sugar companies in western Kenya.	$\beta = 0.264$ $p = 0.000$	$P < 0.05$. hypothesis rejected
H₀₂ : Green manufacturing has no significant effect on the performance of sugar companies in western Kenya.	$\beta = 0.182$ $p = 0.009$	$P < 0.05$. hypothesis rejected
H₀₃ : Eco-Design has no significant effect on the performance of sugar companies in western Kenya.	$\beta = 0.295$ $p = 0.000$	$P < 0.05$. hypothesis rejected
H₀₄ : Green distribution has no significant effect on the performance of sugar companies in western Kenya.	$\beta = 0.364$ $p = 0.610$	$P > 0.05$. hypothesis rejected
H_{05a} : Organizational culture has no significant moderating effect on the relationship between green procurement and the performance of sugar companies in western Kenya	$\beta = -0.292$ $p = 0.001$	$P < 0.05$. hypothesis rejected
H_{05b} : Organizational culture has no significant moderating effect on the relationship between green manufacturing and the performance of sugar companies in western Kenya	$\beta = -0.227$ $p = 0.004$	$P < 0.05$. hypothesis rejected
H_{05c} : Organizational culture has no significant moderating effect on the relationship between eco-design and performance of sugar companies in western Kenya	$\beta = -0.285$ $p = 0.001$	$P < 0.05$. hypothesis rejected
H_{05d} : Organizational culture has no significant moderating effect on the relationship between green distribution and performance of sugar companies in western Kenya	$\beta = -0.270$ $p = 0.020$	$P < 0.05$. hypothesis rejected

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

In light of the particular study objectives, this chapter presents an overview of the study's findings. It also offers policymakers advice, an overview of the results, and areas that warrant additional research.

5.2 Summary of Findings

The increasing need to investigate Organization Culture's moderating role in the relationship between green supply chain management techniques and performance across western Kenyan sugar companies served as the impetus for this study. The investigation produced some conclusions, which can be summed up as follows:

5.2.1 Effect of green procurement on the performance of sugar companies in western Kenya

The first hypothesis posited that green procurement has no significant effect on the performance of sugar companies in Western Kenya. However, the findings revealed that green procurement positively and significantly impacts performance ($\beta_1=0.264$, $p<0.05$), leading to the rejection of H01 and concluding that green procurement significantly influences performance. According to Chiarini and Vagnoni (2018), implementing green procurement practices results in cost savings through waste minimization and resource efficiency, reducing operational costs and enhancing financial performance. Kuei, Chou, and Madu (2019) found that consumers increasingly favor sustainable companies, improving market position and customer loyalty. Furthermore, Ojo, Fauzi, and Ramin (2018) indicated that green procurement fosters a culture of sustainability, boosting employee satisfaction, engagement, and

productivity, and reducing turnover. Walker, Di Sisto, and McBain (2019) noted that green procurement aids regulatory compliance and risk management, helping companies avoid penalties and enhancing long-term viability.

5.2.2 Effect of green manufacturing on the performance of sugar companies in western Kenya

The second hypothesis suggested that green manufacturing has no significant effect on the performance of sugar companies in Western Kenya. However, the findings showed that green manufacturing had a positive and significant impact on performance ($\beta_2=0.182$, $p<0.05$), leading to the rejection of H02 and concluding that green manufacturing significantly influences performance. According to Wang, Geng, and Wang (2018), companies adopting green manufacturing practices achieve substantial cost savings through reduced energy consumption and better resource utilization, enhancing profitability and competitive advantage. Green manufacturing also drives product quality and innovation, meeting consumer demand for environmentally friendly goods, as noted by Chiou, Chan, Lettice, and Chung (2018). This leads to increased customer satisfaction and loyalty, boosting sales and market share. Employee engagement and satisfaction improve when companies commit to sustainability, fostering a motivated workforce, as highlighted by Longoni, Golini, and Cagliano (2018). Additionally, green manufacturing ensures compliance with environmental regulations, avoiding penalties and enhancing market reputation, as found by Azevedo, Brandenburg, and Carvalho (2019).

5.2.3 Effect of eco-design on the performance of sugar companies in western Kenya

The third hypothesis posited that eco-design has no significant effect on the performance of sugar companies in Western Kenya. However, the findings revealed that eco-design has a positive and significant impact on performance ($\beta_3=0.295$, $p<0.05$), leading to the rejection of H03 and concluding that eco-design significantly influences performance. Empirically, a unit increase in eco-design resulted in a 0.295 unit increase in performance. This conclusion is supported by studies such as Choi and Ng (2018) and Dangelico, Pujari, and Pontrandolfo (2019). Eco-design optimizes material and energy use throughout the product lifecycle, achieving substantial cost savings and improving profitability, as noted by Ormazabal, Prieto-Sandoval, Jaca, and Santos (2018). It also enhances market competitiveness by meeting consumer demand for sustainable products, and attracting environmentally conscious customers (Choi & Ng, 2018). Additionally, eco-design fosters innovation, leading to superior products and technological advancements (Dangelico et al., 2019). It ensures compliance with environmental regulations, avoiding legal issues and enhancing market position (Micheli, Cagno, & Zorzini, 2018). Moreover, eco-design improves stakeholder relationships, strengthening corporate reputation and investor confidence (Testa, Iraldo, & Frey, 2018).

5.2.4 Effect of green distribution on the performance of sugar companies in western Kenya

The fourth hypothesis stated that green distribution has no significant effect on the performance of sugar companies in Western Kenya. However, the findings indicated a positive and significant impact of green distribution on performance ($\beta_4=0.364$, $p<0.05$), leading to the rejection of H04 and concluding that green distribution

significantly influences performance. A unit increase in green distribution led to a 0.364 unit increase in performance. This is supported by studies such as Paulraj, Chen, and Blome (2019), and Wu and Pagell (2018). Green distribution enhances cost efficiency by optimizing logistics and reducing waste, as noted by Paulraj et al. (2019), leading to lower fuel consumption and transportation costs. It also improves customer satisfaction and loyalty, as environmentally conscious consumers prefer companies committed to sustainability (Wu & Pagell, 2018). Regulatory compliance is another benefit, as companies adopting green distribution practices can better meet environmental regulations, avoiding fines and penalties (Gonzalez-Benito & Gonzalez-Benito, 2018). Moreover, green distribution enhances sustainability, improving corporate reputation and attracting ESG-focused investors (Zhu, Sarkis, & Lai, 2019). Finally, green distribution fosters innovation, encouraging the development of new processes and technologies that reduce environmental impact and improve efficiency (Yadav, Singh, & Kumar, 2018).

5.2.5 Effect of organization culture on the relationship between green supply chain management strategies on the performance of sugar companies in western Kenya

The results confirmed that organizational culture has a positive and significant effect on the performance of sugar companies in Western Kenya ($\beta = 0.305$, $\rho < 0.05$). According to Chiarini, Belvedere, and Grando (2018), clear and efficient organizational structures streamline processes, reduce redundancies, and improve decision-making, leading to faster response times and better resource allocation. Katou and Budhwar (2019) found that effective human resource management practices, such as continuous training, clear communication, and employee recognition, enhance employee engagement and satisfaction, boosting productivity and organizational performance. Birkinshaw, Zimmerman, and Raisch (2018) emphasized that a culture of innovation

and cross-functional collaboration significantly improves performance metrics. Sabherwal and Becerra-Fernandez (2019) noted that strategic alignment within an organization ensures that all parts work towards common goals, minimizing conflicts and enhancing performance. Effective leadership, particularly transformational leadership that inspires and motivates employees, is crucial for improved organizational outcomes (Northouse, 2018). Finally, Schein and Schein (2018) highlighted that a positive organizational culture valuing collaboration, transparency, and continuous improvement leads to higher employee engagement, customer satisfaction, and overall organizational success.

5.3 Conclusion

Based on the findings, it is concluded that green procurement practices and performance are positively and significantly related. Implementing green procurement practices results in cost savings, improved market position, and customer loyalty while fostering employee satisfaction and engagement. Additionally, it aids in regulatory compliance and risk management, contributing to overall financial performance and long-term viability.

The study further concludes that green manufacturing and performance are positively and significantly related. Green manufacturing practices result in substantial cost savings, improved product quality and innovation, and higher customer satisfaction and loyalty. Additionally, they foster employee engagement and ensure compliance with environmental regulations, thereby enhancing profitability and competitive advantage.

Similarly, Eco Design and performance were found to be positively and significantly related. Eco-design optimizes material and energy use, enhances market competitiveness, fosters innovation, ensures regulatory compliance, and improves

stakeholder relationships. Thus, integrating eco-design practices is crucial for achieving substantial performance gains and sustainable competitive advantages.

The study concludes that green distribution and performance are positively and significantly related. This demonstrates that adopting green distribution practices can result in substantial performance gains, as supported by empirical literature. Thus, integrating green distribution into business strategies is crucial for achieving sustainable and competitive advantages.

It is concluded that organizational culture moderates the relationship between green supply chain management strategies and the performance of sugar companies in western Kenya. Therefore, organizational Culture moderates the relationship between green supply chain management strategies and the performance of sugar companies in western Kenya. The Organization's Culture includes exhibiting loyalty towards systems in the organization, doing only what they are authorized to do, encouraging continuous improvement, recognizing employees' contributions and suggestions, and ensuring documentation and information management.

5.4 Recommendations

5.4.1 Managerial recommendations

Company managers should actively cultivate and promote an organizational culture that supports sustainability and green initiatives. It can be accomplished through training programs, workshops, and internal communication strategies that emphasize the importance and benefits of green supply chain management (GSCM). Specifically, managers should integrate green procurement practices by partnering with suppliers who prioritize environmental sustainability. Additionally, investing in green

manufacturing technologies and processes can significantly enhance operational efficiency and reduce environmental impact.

Managers should also prioritize eco-design principles to minimize waste and promote product recyclability. Implementing green distribution methods, such as optimizing transportation routes and using energy-efficient logistics, can further improve performance and reduce carbon footprints.

Moreover, managers should foster a collaborative culture that encourages employee participation in sustainability initiatives, as this can enhance the overall effectiveness of GSCM strategies. Finally, it is important for managers to regularly evaluate and adapt their GSCM strategies in response to changing environmental regulations and market conditions.

5.4.2 Policy recommendations

Policymakers should develop and enforce regulations that encourage and, where feasible, mandate the adoption of green supply chain management (GSCM) strategies. This includes creating incentives for companies that implement green procurement by sourcing from environmentally responsible suppliers, thus promoting sustainable practices throughout the supply chain.

Furthermore, regulatory bodies should establish standards and provide guidance for green manufacturing processes, ensuring that sugar companies adopt technologies and methods that reduce environmental impact and enhance efficiency.

Policies that support eco-design principles, such as tax incentives for companies that invest in recyclable and sustainable product designs, can also drive industry-wide improvements. To encourage green distribution, regulators could promote

infrastructure development for energy-efficient logistics and provide subsidies for companies investing in eco-friendly transportation solutions.

Additionally, policymakers should consider creating frameworks that encourage organizational cultures supportive of sustainability by offering recognition and awards for companies demonstrating significant advancements in GSCM. It is also crucial for regulatory bodies to facilitate continuous learning and development programs that help organizations stay updated with the latest green practices and technologies.

5.4.3 Theoretical recommendations

Complexity theory emphasizes the need for organizations to be responsive to changes and uncertainties in their environment. Companies should foster a culture of continuous learning and innovation to adapt to the evolving requirements of green manufacturing, eco-design, green procurement, and green distribution. By encouraging cross-functional collaboration and leveraging advanced technologies, companies can enhance their ability to respond to complex environmental challenges, ultimately improving their performance.

Transaction cost economics theory suggests that reducing transaction costs is essential for improving organizational efficiency and performance. It recommends that companies should streamline their supply chain processes by establishing long-term partnerships with suppliers and investing in information systems that enhance transparency and coordination. By minimizing transaction costs associated with negotiating, monitoring, and enforcing contracts, companies can achieve more efficient green procurement and distribution practices. Furthermore, adopting standardized procedures and protocols for green manufacturing and eco-design can reduce

uncertainty and improve trust among supply chain partners, leading to better performance outcomes.

Organizational culture theory highlights the importance of aligning corporate culture with strategic objectives to achieve desired outcomes. It recommends companies should cultivate a culture that values environmental sustainability and integrates it into their core values and practices. Leadership should actively promote green initiatives and engage employees at all levels to foster a shared commitment to GSCM strategies. This can be achieved through training programs, recognition of environmentally friendly practices, and involving employees in decision-making processes related to sustainability.

5.5 Areas for Further Studies

Future studies could expand the geographical scope beyond Western Kenya to include other regions or counties, providing a comparative analysis that could highlight regional differences in the effectiveness of green supply chain management strategies. Researchers could explore the impact of different types of organizational cultures such as hierarchical, market-oriented, clan, and adhocracy on the relationship between green supply chain management and performance, to determine which culture types are most conducive to sustainability. Longitudinal studies would be beneficial to assess the effect of green supply chain initiatives on organizational performance, as well as to observe any changes in organizational culture over time. There is also a need to examine the influence of external factors, such as government policies, market conditions, and technological advancements, on the effectiveness of green supply chain strategies.

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APPENDICES

Appendix I: Introductory Letter to Research Respondents

Dear Participant:

My name is Judith Ziporah Mwalati. I am an MLS student at the School of Business, Moi University. I'm currently undertaking my research project entitled "Green Supply Chain Management Strategies and Organization Culture on Organization Performance of Sugar Manufacturing Companies in Western Kenya. The attached questionnaire is for gathering data, which will be useful in the mentioned research.

You have been selected as one of the respondents in this study. I therefore request you to kindly facilitate the collection of the required data by answering the questions herein. Please note that the information sought is purely for academic purposes and will be treated with utmost confidentiality. I promise that a copy of the final report will be available to you on demand.

Your cooperation will be highly appreciated

Yours faithfully,

Judith Mwalati

Phone number :(0701561068)

Email: mwalatijudy2@gmail.com

PART TWO: PRACTICES OF GREEN SUPPLY CHAIN MANAGEMENT

Below is a list of practices of Green Supply Chain Management. Please tick appropriately the extent to which each of them is practiced in your company. (Key: 1=strongly disagree (SD), 2=disagree (D), 3=neutral (N), 4=agree (A), 5=strongly agree (SA))

GREEN PROCUREMENT PRACTICES	SD	D	N	A	SA
	1	2	3	4	5
We evaluate suppliers on specific environmental criteria					
We Purchase energy saving equipment					
The company uses paperless methods to order materials					
Company Procures products that are made using recycled packages					
We Require suppliers to have ISO 14001					
We Ensure suppliers meet their environmental objectives					
GREEN MANUFACTURING PRACTICES	SD	D	N	A	SA
	1	2	3	4	5
The company generates low or no waste or pollution					
Company incurs lower raw material costs					
We encourage reuse of products and recycled materials					
The company replaces hazardous substances with those that are environmentally friendly					
We control power consumption in the products					
we produce products that have packages that can be recycled					
We ensure products have recyclable contents					
ECO-DESIGN	SD	D	N	A	SA
	1	2	3	4	5
The company uses cleaner technology processes					
We use green raw materials and components					
We provide design specifications to our partners that include environmental requirements for purchased items.					
We design our products for reuse, recycling, and recovery of material and component parts					
We design our products to avoid or reduce the use of hazardous products and their manufacturing process.					
GREEN DISTRIBUTION	SD	D	N	A	SA
	1	2	3	4	5
The company uses alternative fuels					
We cooperate with suppliers to standardize packaging					
The company Reduces the size of the packaging					
We Promote recycling and reuse programs among the employees					

PART THREE: ORGANIZATION CULTURE

ORGANIZATION CULTURE	SD 1	D 2	N 3	A 4	SA 5
We pursue goals and targets					
We adhere to contractual obligations.					
We exhibit loyalty towards systems in the organization					
We only do what we are authorized to do.					
We adhere to procurement regulations to guide our activities and processes.					
We ensure documentation and information management.					
We encourage continuous improvement					
We recognize employee's contributions and suggestions					

PART FOUR: RELATIONSHIP BETWEEN GREEN SUPPLY CHAIN MANAGEMENT PRACTICES AND FIRM PERFORMANCE

IMPACT OF GREEN SUPPLY CHAIN MANAGEMENT PRACTICES ON ORGANIZATION PERFORMANCE	SD 1	D 2	N 3	A 4	SA 5
Environmental performance					
Our CO2 emission has been reduced after the introduction of green management.					
Our waste water has been reduced after the introduction of green management.					
Our solid waste has been reduced after the introduction of green management.					
Our energy consumption has been reduced after the introduction of green management.					
Operational performance					
The quality of sugar has improved					
There are decreased inventory levels					
On-time delivery of goods					
There is a decreased manufacturing lead time					

Appendix III: List of Sugar Companies in the Western Region

1. Busia Sugar Company.
2. Butali mills factory
3. Chemilil Sugar Company
4. Kibos sugar company
5. Muhoroni Sugar Company
6. Nzoia Sugar Company
7. Sony Sugar Company
8. South Nyanza Sugar Company
9. Sukari industries limited
10. West Kenya Sugar Company

Appendix IV: SPSS Output

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.741 ^a	.549	.538	.359158509027055

a. Predictors: (Constant), GD, GP, ED, GM

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	27.289	4	6.822	52.888	.000 ^b
	Residual	22.445	174	.129		
	Total	49.734	178			

a. Dependent Variable: PER

b. Predictors: (Constant), GD, GP, ED, GM

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.553	.318		-1.741	.083
	GP	.264	.069	.218	3.803	.000
	GM	.182	.068	.169	2.655	.009
	ED	.295	.066	.270	4.441	.000
	GD	.364	.071	.321	5.119	.000

a. Dependent Variable: PER

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	OC, GM, GP, ED, GD ^b		Enter

a. Dependent Variable: PER

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.785 ^a	.616	.605	.332352752380785

a. Predictors: (Constant), OC, GM, GP, ED, GD

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	30.625	5	6.125	55.450	.000 ^b
	Residual	19.109	173	.110		
	Total	49.734	178			

a. Dependent Variable: PER

b. Predictors: (Constant), OC, GM, GP, ED, GD

Coefficients^a

Model		Unstandardized Coefficients		Standardized	t	Sig.
		B	Std. Error	Coefficients		
				Beta		
1	(Constant)	-.878	.300		-2.929	.004
	GP	.197	.065	.162	3.012	.003
	GM	.181	.063	.169	2.867	.005
	ED	.277	.062	.253	4.493	.000
	GD	.256	.069	.225	3.720	.000
	OC	.305	.056	.292	5.495	.000

a. Dependent Variable: PER

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	ddp_doc, GP, OC, GM, ED, GD ^b		Enter

a. Dependent Variable: PER

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.819 ^a	.671	.659	.308637787565 742

a. Predictors: (Constant), ddp_doc, GP, OC, GM, ED, GD

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	33.350	6	5.558	58.350	.000 ^b
	Residual	16.384	172	.095		
	Total	49.734	178			

a. Dependent Variable: PER

b. Predictors: (Constant), ddp_doc, GP, OC, GM, ED, GD

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.157	.339		.463	.644
	GP	.203	.061	.168	3.348	.001
	GM	.139	.059	.129	2.341	.020
	ED	.174	.060	.159	2.881	.004
	GD	.202	.065	.178	3.124	.002
	OC	.231	.053	.221	4.326	.000
	ddp_doc	-.454	.085	-.298	-5.349	.000

a. Dependent Variable: PER

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	dgm_doc, GM, OC, GP, ED, GD, ddp_doc ^b		Enter

a. Dependent Variable: PER

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.836 ^a	.698	.686	.296187014335 351

a. Predictors: (Constant), dgm_doc, GM, OC, GP, ED, GD, ddp_doc

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	34.733	7	4.962	56.560	.000 ^b
	Residual	15.001	171	.088		
	Total	49.734	178			

a. Dependent Variable: PER

b. Predictors: (Constant), dgm_doc, GM, OC, GP, ED, GD, ddp_doc

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.548	.340		1.612	.109
	GP	.169	.059	.140	2.878	.005
	GM	.146	.057	.136	2.572	.011
	ED	.146	.058	.134	2.509	.013
	GD	.190	.062	.167	3.057	.003
	OC	.194	.052	.186	3.736	.000
	ddp_doc	-.335	.087	-.220	-3.850	.000
	dgm_doc	-.309	.078	-.211	-3.970	.000

a. Dependent Variable: PER

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	ded_doc, GP, OC, ED, GM, dgm_doc, GD, ddp_doc ^b		Enter

a. Dependent Variable: PER

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.845 ^a	.714	.701	.289151135973898

a. Predictors: (Constant), ded_doc, GP, OC, ED, GM, dgm_doc, GD, ddp_doc

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	35.521	8	4.440	53.106	.000 ^b
	Residual	14.213	170	.084		
	Total	49.734	178			

a. Dependent Variable: PER

b. Predictors: (Constant), ded_doc, GP, OC, ED, GM, dgm_doc, GD, ddp_doc

Coefficients^a

Model		Unstandardized Coefficients		Standardized	t	Sig.
		B	Std. Error	Coefficients Beta		
1	(Constant)	.637	.333		1.911	.058
	GP	.170	.057	.140	2.963	.003
	GM	.120	.056	.112	2.139	.034
	ED	.161	.057	.148	2.825	.005
	GD	.175	.061	.154	2.872	.005
	OC	.194	.051	.186	3.824	.000
	ddp_doc	-.310	.085	-.204	-3.641	.000
	dgm_doc	-.246	.079	-.168	-3.128	.002
	ded_doc	-.264	.086	-.143	-3.070	.002

a. Dependent Variable: PER

Correlations

		PER	GP	GM	ED	GD	OC
PER	Pearson Correlation	1	.493**	.544**	.572**	.608**	.555**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
	N	179	179	179	179	179	179
GP	Pearson Correlation	.493**	1	.436**	.400**	.407**	.375**
	Sig. (2-tailed)	.000		.000	.000	.000	.000
	N	179	182	182	182	182	182
GM	Pearson Correlation	.544**	.436**	1	.509**	.556**	.329**
	Sig. (2-tailed)	.000	.000		.000	.000	.000
	N	179	182	183	182	182	182
ED	Pearson Correlation	.572**	.400**	.509**	1	.512**	.339**
	Sig. (2-tailed)	.000	.000	.000		.000	.000
	N	179	182	182	182	182	182
GD	Pearson Correlation	.608**	.407**	.556**	.512**	1	.475**
	Sig. (2-tailed)	.000	.000	.000	.000		.000
	N	179	182	182	182	182	182
OC	Pearson Correlation	.555**	.375**	.329**	.339**	.475**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	179	182	182	182	182	182

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

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	gdg_doc, ded_doc, ED, OC, GP, GM, dgm_doc, GD, ddp_doc ^b		Enter

a. Dependent Variable: PER

b. All requested variables entered.

Model Summary

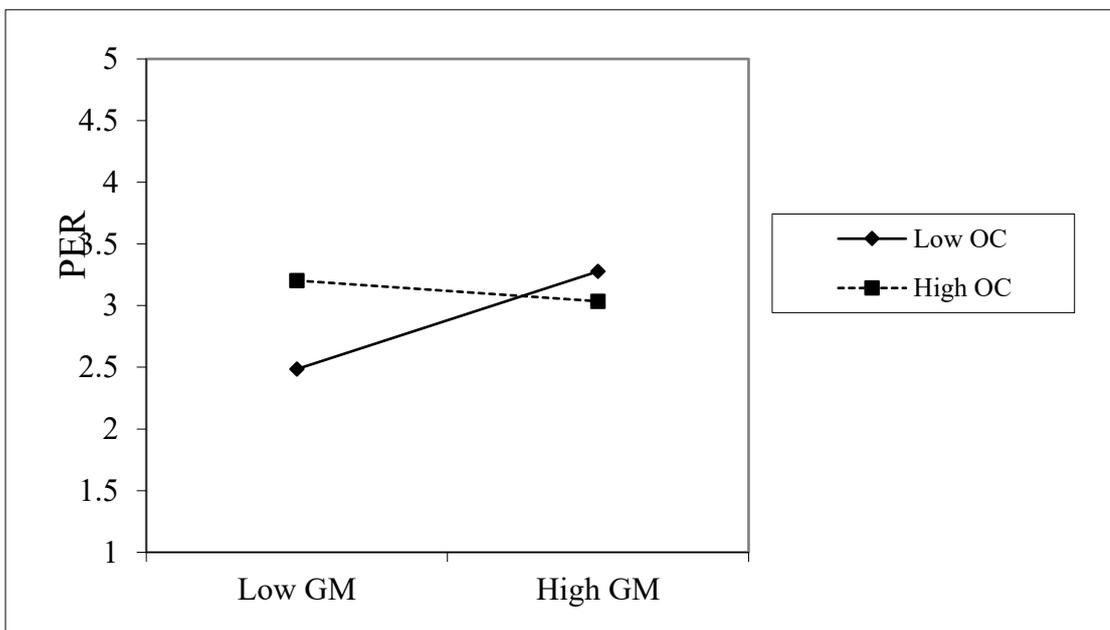
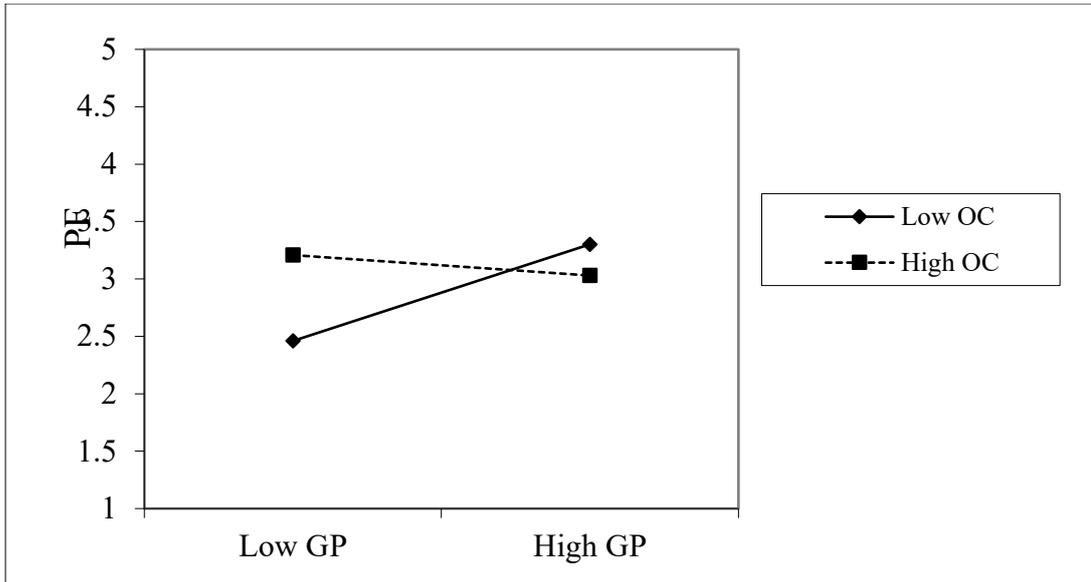
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.850 ^a	.723	.708	.285408993193 105

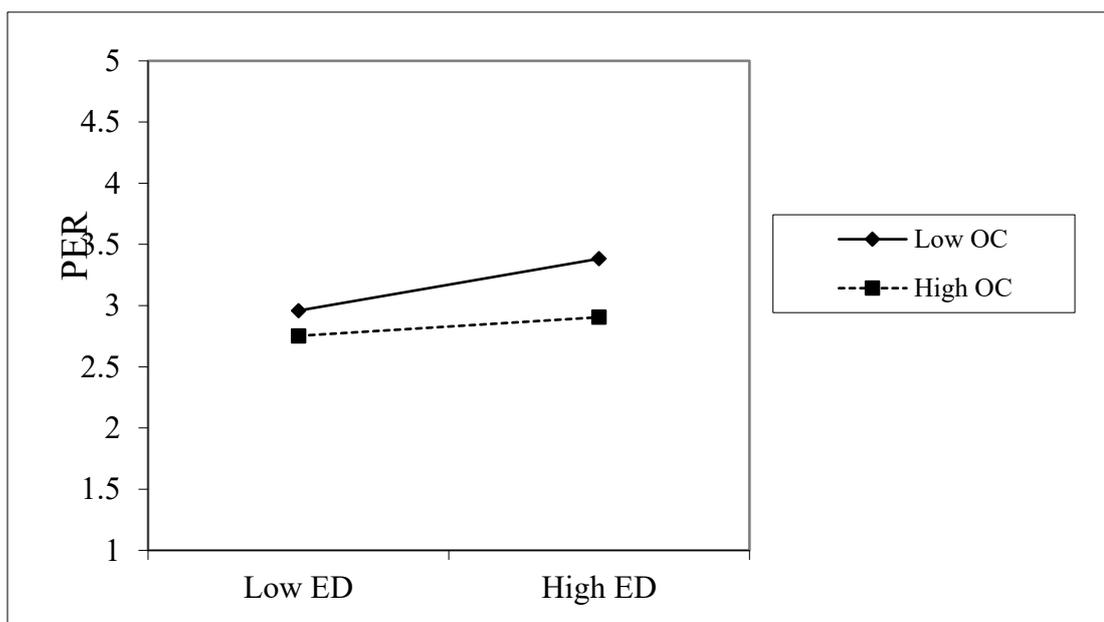
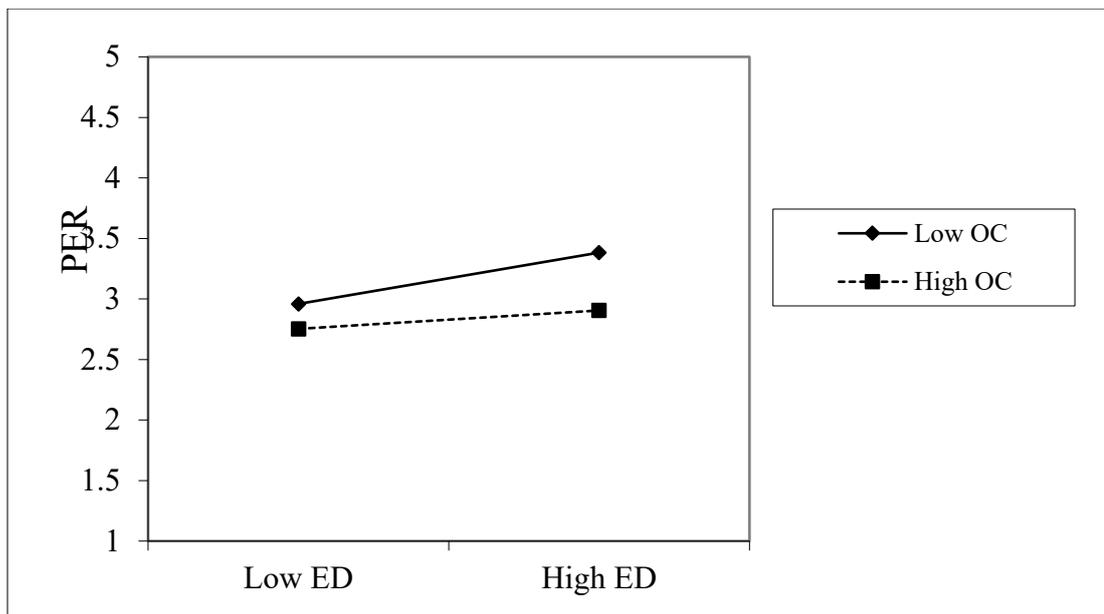
a. Predictors: (Constant), gdg_doc, ded_doc, ED, OC, GP, GM, dgm_doc, GD, ddp_doc

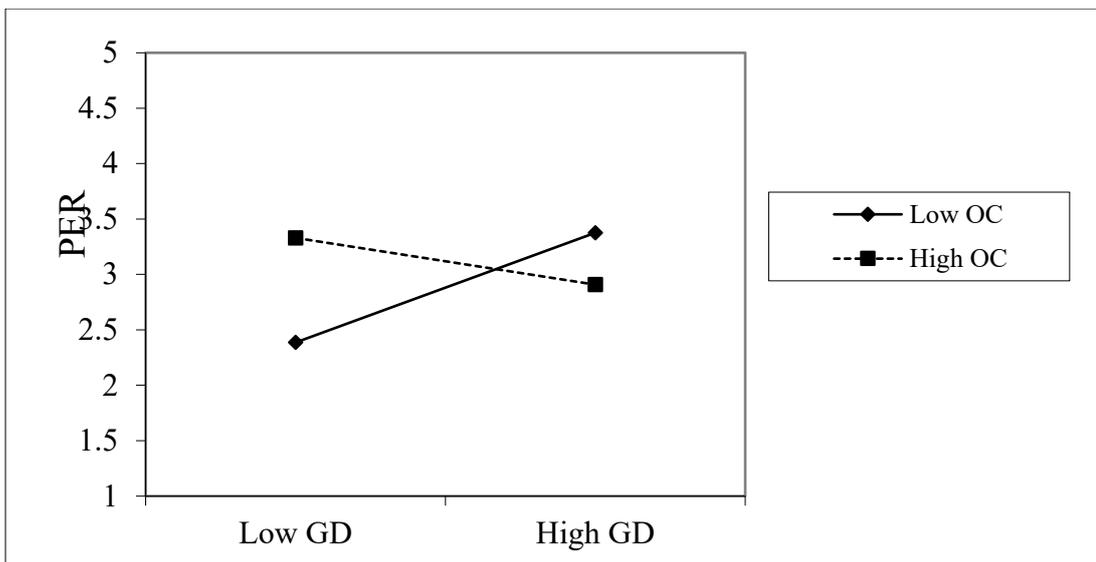
Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.794	.336		2.365	.019
	GP	.154	.057	.127	2.698	.008
	GM	.116	.056	.108	2.094	.038
	ED	.160	.056	.146	2.833	.005
	GD	.176	.060	.155	2.931	.004
	OC	.174	.051	.167	3.425	.001
	ddp_doc	-.292	.085	-.191	-3.450	.001
	dgm_doc	-.227	.078	-.155	-2.908	.004
	ded_doc	-.285	.085	-.154	-3.346	.001
	gdg_doc	-.270	.115	-.103	-2.342	.020

a. Dependent Variable: PER







Coefficients^a

Model		Unstandardized Coefficients		Standardize	t	Sig.	Collinearity Statistics	
		B	Std. Error	d Coefficients Beta			Tolerance	VIF
1	(Constant)	-.878	.300		-2.929	.004		
	GP	.197	.065	.162	3.012	.003	.764	1.308
	GM	.181	.063	.169	2.867	.005	.642	1.557
	ED	.277	.062	.253	4.493	.000	.698	1.433
	GD	.256	.069	.225	3.720	.000	.607	1.647
	OC	.305	.056	.292	5.495	.000	.785	1.274

a. Dependent Variable: PER

Collinearity Diagnostics^a

Model	Dimensio n	Eigenvalu e	Condition Index	Variance Proportions					
				(Constant)	GP	GM	ED	GD	OC
1	1	5.957	1.000	.00	.00	.00	.00	.00	.00
	2	.014	20.561	.00	.00	.11	.10	.00	.76
	3	.009	25.440	.19	.30	.08	.03	.22	.06
	4	.008	26.531	.00	.01	.35	.82	.04	.01
	5	.007	29.608	.04	.00	.45	.04	.72	.17
	6	.005	35.210	.77	.68	.01	.01	.02	.00

a. Dependent Variable: PER

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.785 ^a	.616	.605	.332352752380 785	2.052

a. Predictors: (Constant), OC, GM, GP, ED, GD

b. Dependent Variable: PER

Appendix VI: Plagiarism Awareness Certificate



SR781

ISO 9001:2019 Certified Institution

THESIS WRITING COURSE

PLAGIARISM AWARENESS CERTIFICATE

This certificate is awarded to

JUDITH ZIPORAH MWALATI

MLS/8023/20

In recognition for passing the University's plagiarism

Awareness test for Thesis **entitled** THE MODERATING EFFECT OF ORGANIZATION CULTURE ON THE RELATIONSHIP BETWEEN GREEN SUPPLY CHAIN MANAGEMENT STRATEGIES AND PERFORMANCE OF SUGAR COMPANIES IN WESTERN KENYA **with** similarity index of 13% and striving to maintain academic integrity.

Word count:27471

Awarded by

Prof. Anne Syomwene Kisilu

CERM-ESA Project Leader Date: 13/02//2025