Int Journal of Social Sciences Management and Entrepreneurship 9(2): 161-179 2025

ISSN 2411-7323

www.sagepublishers.com

GREEN PROCUREMENT AND PERFORMANCE OF SUGAR COMPANIES IN KENYA

[1] Monyancha Lilian Nyaboke, [2] Dr. Ndeto Charles

[1]Masters Student, Jomo Kenyatta University of Agriculture and Technology
[2]Lecturer, Jomo Kenyatta University of Agriculture and Technology

ABSTRACT

Performance of sugar companies in Kenya has been declining over the years. The general objective of the study was to determine the influence of green procurement on performance of sugar companies in Kenya. Specifically, this study sought to establish the effect of green tendering on performance of sugar companies in Kenya and to assess effect of green inventory control on performance of sugar companies in Kenya. This study used descriptive research design. This study was conducted in sugar companies in Kenya. These companies include; Mumias sugar company, Nzoia Sugar Company, West Kenya Sugar Company, West Kenya-Olepito Sugar Unit, Butali Sugar Company and Busia Sugar Industries. The study targeted Management Employees in procurement and supply chain department in all companies. The employees were targeted since they are involved in the procurement process. In every company, the study focused on 2 top manager, 6 middle level managers and 10 lower level managers. This implies that the total target population was 108 management employees. Since the sample size was small the study used census method. This research used a questionnaire to collect primary data. This study gathered both quantitative and qualitative data. Qualitative data analyzed by use of content analysis. Quantitative data was coded then analyzed using Statistical Package for Social Sciences (SPSS) computer software version 28. Data analysis was done through use of descriptive and inferential statistics. Descriptive statistics were used to analyze the data in frequency distributions and percentages. Inferential statistics comprised of correlation and regression analysis. The study results were presented in tables and figures. The study concludes that green tendering has a positive and significant influence on performance of sugar companies in Kenya. Further, the study concludes that green inventory control has a positive and significant influence on performance of sugar companies in Kenya. The study recommends that the management of sugar companies should embrace green tendering practices, as they have demonstrated a positive and significant influence on overall company performance. In addition, the study recommends that the management of sugar companies should invest in green warehousing, as it has a positive and significant impact on their performance.

Key Words: Green Procurement, Green Tendering, Green Inventory Control, Performance of Sugar Companies

Background of the Study

The agricultural and manufacturing sectors are two pivotal pillars of the economy, particularly in developing countries (Olutoye & Gakure, 2020). The agricultural sector, which includes the cultivation of crops and livestock farming, serves as a major source of livelihood for a large proportion of the population, providing food, raw materials, and employment. In many economies, including Kenya, agriculture contributes significantly to the Gross Domestic Product (GDP), rural development, and poverty alleviation (Mulyungi & Bumali, 2021). The manufacturing sector, on the other hand, adds value to raw materials from agriculture and other industries, contributing to job creation, industrial growth, and export revenues. These two sectors are intricately linked, with agriculture providing raw materials for manufacturing and manufacturing processes driving the demand for agricultural products. Together, they form a foundation for economic growth, industrialization, and diversification (Sarhaye & Marendi, 2023).

The sugar industry, as part of the broader agricultural and manufacturing sectors, plays a critical role in boosting the economy. In Kenya, the sugar sector is vital, contributing significantly to both employment and economic output. The industry provides direct employment to over 500,000 people, including farmers, factory workers, and others in related fields (Kenya Sugar Board, 2020). Additionally, sugar production contributes approximately 0.8% to Kenya's GDP and generates substantial foreign exchange through exports. The sector also stimulates growth in rural areas by supporting smallholder farmers who supply cane to sugar mills. With Kenya's growing sugar demand, both locally and regionally, the sector has a substantial potential for growth and economic enhancement (Nderitu & Ngugi, 2024).

Sugar companies are businesses involved in the production, processing, and distribution of sugar derived from various sources, primarily sugarcane and sugar beets. These companies manage the entire supply chain, from cultivating the raw materials to refining them into granulated sugar, syrups, and other sugar-based products (Thoo *et al*, 2023). They may also engage in the production of by-products like molasses and ethanol. Sugar companies often operate large-scale processing plants and may be involved in global trade, supplying sugar to food and beverage manufacturers, retailers, and consumers. Additionally, some sugar companies diversify into other agricultural or renewable energy sectors, while navigating challenges related to sustainability, health concerns, and market fluctuations (Shabir *et al*, 2022).

One of the primary roles of sugar companies is the production and refining of sugar from raw materials like sugarcane and sugar beets. These companies manage large-scale agricultural operations where sugarcane is cultivated or sugar beets are grown (Claudia & Charbel, 2022). Once harvested, the raw material undergoes a refining process in sugar mills and factories where it is converted into various forms of sugar, such as granulated sugar, powdered sugar, and syrups. The refining process involves extracting juice from the plants, purifying it, and removing impurities to create a final product suitable for commercial use. This process is critical for ensuring a consistent supply of high-quality sugar for various industries, including food and beverage, pharmaceuticals, and cosmetics (Leal-Filho *et al*, 2022).

Sugar companies also play a significant role in the global distribution and trade of sugar products. As sugar is in high demand worldwide, especially in the food and beverage industry, these companies act as key players in the supply chain, exporting sugar to international markets (Azharul *et al*, 2024). They work with logistics, warehousing, and distribution networks to ensure that sugar reaches manufacturers, wholesalers, and retailers efficiently. Additionally, they may be involved in price-setting and market trends, influencing the sugar commodity market and dealing with issues such as tariffs, trade agreements, and supply shortages. By

navigating these global dynamics, sugar companies contribute to the smooth functioning of both local and international economies (Olutoye & Gakure, 2020).

In recent years, sugar companies have also focused on innovation and sustainability efforts, recognizing the growing demand for environmentally responsible and health-conscious products. Many companies have adopted more sustainable agricultural practices, such as using less water and reducing pesticide use in the cultivation of sugar crops (Kipuyo, 2022). Additionally, they have explored the use of renewable energy by converting by-products like bagasse (a fibrous residue from sugarcane) into bioenergy. On the innovation front, some sugar companies have invested in research to develop alternative sweeteners, lower-calorie sugar options, or plant-based sugar substitutes in response to rising concerns about health issues like obesity and diabetes. These efforts help sugar companies stay relevant in a changing market and contribute to global sustainability goals (Anane, 2023).

Green procurement refers to the practice of purchasing goods and services that have a minimal negative impact on the environment, both in terms of production and lifecycle. This approach involves selecting products and suppliers based on their environmental credentials, such as using sustainable materials, reducing energy consumption, or ensuring ethical sourcing practices (Mulyungi & Bumali, 2021). Green procurement aims to minimize the carbon footprint and environmental degradation associated with production, transportation, and disposal. Organizations that adopt green procurement policies often prioritize eco-friendly alternatives, such as products made from recycled materials, energy-efficient equipment, or those that adhere to environmental certifications. The goal is to support sustainability efforts, reduce waste, and contribute to a circular economy, all while meeting organizational needs (Mugunda, 2023).

Green tendering refers to the process of integrating environmental criteria into the procurement process when selecting suppliers or contractors for a project or service. Unlike traditional tendering, which focuses primarily on cost, quality, and delivery, green tendering evaluates potential suppliers based on their environmental impact (Nasiche & Ngugi, 2024). This includes factors such as their sustainability practices, energy consumption, waste management, carbon emissions, and the eco-friendliness of the products or services they offer. By incorporating these considerations into the tendering process, organizations can ensure they are working with partners who share their commitment to sustainability and reducing their overall environmental footprint. Green tendering encourages the adoption of environmentally responsible practices within the supply chain and can lead to more sustainable procurement decisions (Obiso *et al*, 2023).

Green warehousing focuses on making the operations of a warehouse or distribution center more sustainable. This involves adopting practices that reduce energy consumption, minimize waste, and lower the environmental impact of warehouse operations (Nderitu & Ngugi, 2024). Examples of green warehousing include using energy-efficient lighting and HVAC systems, installing solar panels, optimizing the use of space to reduce energy usage, and implementing waste recycling programs. Additionally, green warehouses may focus on reducing the carbon footprint of their transportation operations by prioritizing fuel-efficient vehicles or alternative energy sources. Green warehousing plays a crucial role in the overall sustainability efforts of businesses by improving the environmental performance of logistics operations (Sarhaye & Marendi, 2023).

Green inventory control aims to manage inventory in a way that reduces environmental impact while still meeting the needs of the business. This includes adopting practices that minimize overproduction, reduce waste, and ensure more efficient use of resources (Mutangili, 2021). Companies can optimize inventory levels to avoid excess stock, which can lead to waste or the need for excessive storage space. Furthermore, green inventory control can involve sourcing

products with a lower environmental impact, such as items that are recyclable or made from sustainable materials. Effective green inventory control not only helps reduce costs and waste but also ensures that a business's supply chain operates in a more environmentally responsible manner (Thoo *et al*, 2023).

Reverse logistics is the process of managing the return of products from consumers back to the manufacturer or retailer, with a focus on minimizing waste and maximizing the reuse, recycling, or repurposing of materials. In the context of green procurement, reverse logistics plays a crucial role in reducing the environmental impact of returned goods, packaging, and waste (Shabir *et al*, 2022). For example, companies might encourage customers to return used products for recycling, repair, or refurbishment, which helps extend the lifecycle of the product and reduces the demand for new resources. Reverse logistics can also involve the efficient disposal of hazardous materials or managing product returns in a way that minimizes the carbon footprint associated with transportation and landfill waste (Claudia & Charbel, 2022). By incorporating reverse logistics into green procurement strategies, organizations can contribute to a circular economy, where resources are continually reused or recycled, leading to a more sustainable and environmentally-friendly supply chain (Leal-Filho *et al*, 2022). To fill the highlighted gap, the study sought to determine the influence of green procurement and performance of sugar companies in Kenya.

Statement of the Problem

Sugar companies are vital to the global economy and society, as they supply a key ingredient used in various industries, from food and beverages to pharmaceuticals and cosmetics. Their operations support millions of jobs, particularly in agriculture and processing, and contribute significantly to local economies, especially in rural and developing regions (Nasiche & Ngugi, 2024). Beyond economic importance, many sugar companies adopts sustainable practices, such as reducing carbon footprints, investing in renewable energy, and promoting environmentally-friendly farming techniques. As public health concerns around sugar consumption rise, these companies also innovate to meet demand for healthier alternatives, like low-calorie and plant-based sweeteners. By balancing economic, environmental, and health considerations, sugar companies continue to play an essential role in a rapidly evolving global market (Obiso *et al*, 2023).

Sugar companies face a variety of challenges that impact their operations and long-term sustainability, with profitability being one of the most significant hurdles. Profit margins in the sugar industry have been under pressure due to fluctuating commodity prices, rising production costs, and government regulations (Nderitu & Ngugi, 2024). For instance, the global price of sugar has seen considerable volatility, with prices dropping to as low as $0.12 per pound in 2018, compared to highs of $0.23 per pound in 2016. This volatility makes it difficult for sugar companies to predict their revenue streams and manage costs effectively. Furthermore, the rising cost of raw materials, energy, and labor, as well as the financial burdens associated with maintaining sustainability practices, compounds the challenge to profitability. The competitive nature of the market and the constant need for innovation also add additional pressure to sugar companies aiming to maintain financial stability (Sarhaye & Marendi, 2023).

In addition to profitability, market share is another significant challenge for sugar companies. With an increasing number of players entering the market, particularly in emerging economies, established sugar companies are facing intensified competition (Mutangili, 2021). According to a 2020 report by IBISWorld, the global sugar production industry was valued at $60 billion, with top companies such as Brazil's Copersucar and India's Triveni Engineering holding substantial shares. However, even these giants must deal with competition from smaller, regional producers, and alternative sweeteners like high-fructose corn syrup, which have gained popularity due to their lower cost and potential health benefits. As a result, sugar

companies are constantly seeking ways to diversify their product offerings, improve efficiencies, and adapt to new market trends in order to preserve or grow their market share (Nasiche & Ngugi, 2024). Reports show that sugar consumption in developed countries has been steadily declining. For example, in the U.S., per capita sugar consumption dropped from 87.4 pounds per person in 2000 to 76.7 pounds in 2020, according to the U.S. Department of Agriculture (Sarhaye & Marendi, 2023). This has prompted sugar companies to innovate by offering healthier alternatives, such as low-calorie, organic, or plant-based sweeteners. However, meeting these changing preferences while maintaining a competitive edge in taste, quality, and cost remains a challenge. Sugar companies must balance consumer health concerns with their traditional offerings and continue to find ways to satisfy evolving market demands without sacrificing profitability or market share (Nderitu & Ngugi, 2024).

Green procurement plays a crucial role in promoting sustainability and environmental responsibility within supply chains by encouraging organizations to purchase goods and services that have minimal environmental impact (Mutangili, 2021). This practice involves selecting products based on criteria such as energy efficiency, use of sustainable materials, reduced carbon emissions, and overall environmental footprint. For instance, the global green procurement market was valued at approximately $9.7 billion in 2020 and is projected to grow at a compound annual growth rate (CAGR) of 8.6%, reaching nearly $19 billion by 2028, according to a report by Grand View Research. This growth highlights the increasing importance of green procurement as businesses and governments prioritize sustainability goals. Various studies have been conducted in different parts of the world on green procurement and performance of sugar companies. Nasiche and Ngugi (2024) researched on the determinants of adoption of green procurement in the public sector: A case study of Kenya Pipeline Company, Nderitu and Ngugi (2024) examined the effects of green procurement practices on an organization performance in manufacturing industry: Case Study Of East African Breweries Limited, and Mutangili (2021) assessed the influence of Green Procurement Practices in Supply Chain Management and Leadership on Performance of Parastatals in Kenya; A case of Kenya Airways and Kenya Pipeline. To fill the highlighted gaps, the current study sought to determine the influence of green procurement (green tendering, green warehousing, green inventory control and reverse logistics) on the performance of sugar companies in Kenya.

General Objective

The general objective of the study was to determine the influence of green procurement on performance of sugar companies in Kenya

Specific Objectives

i. To establish the effect of green tendering on performance of sugar companies in Kenya
ii. To assess effect of green inventory control on performance of sugar companies in Kenya

Theoretical Review

Resource-Based View (RBV) Theory

The Resource-Based View (RBV) theory founded by Barney (1991) is a strategic management framework that focuses on the internal resources and capabilities of a firm as sources of competitive advantage (Bohari & Xia, 2020). At its core, RBV posits that a firm's unique bundle of resources and capabilities can enable it to achieve sustainable competitive advantage and superior performance in the marketplace. Unlike traditional strategic management approaches that primarily focus on external factors such as market dynamics and industry structure, RBV emphasizes the importance of internal factors in determining a firm's success (Babalwa, 2024). RBV theory entails identifying and leveraging a firm's distinctive resources

and capabilities to create value and achieve strategic objectives. Resources can include tangible assets such as physical infrastructure, financial capital, and technology, as well as intangible assets such as human capital, intellectual property, organizational culture, and reputation. These resources are considered valuable if they enable the firm to exploit opportunities or neutralize threats in the external environment. Capabilities, on the other hand, refer to the firm's ability to effectively deploy and utilize its resources to perform specific activities and achieve desired outcomes (Kilonzi & Mwikali, 2022).

The Resource-Based View (RBV) theory of strategic management is built upon several foundational assumptions that shape its approach to analyzing firm performance and competitive advantage (Mutangili, 2020). One key assumption of RBV is that firms are heterogeneous in terms of the resources and capabilities they possess. This means that each firm has a unique bundle of resources—both tangible and intangible—that is valuable, rare, difficult to imitate, and non-substitutable (VRIN). RBV posits that these distinctive resources and capabilities are the primary sources of sustained competitive advantage and superior performance. Another assumption of RBV is that firms are rational and profit-maximizing actors that seek to exploit their resources and capabilities to create value for stakeholders. RBV theory also assumes that resources are not static, but can be developed, accumulated, and leveraged over time to enhance a firm's competitive position (Nyaga & Achuora, 2021). This implies that firms can invest in building and renewing their resource base, as well as developing dynamic capabilities that enable them to adapt and respond effectively to changes in the external environment. Additionally, RBV assumes that markets are imperfect and that firms can earn economic rents by possessing unique resources and capabilities that are not fully captured by market prices. These rents can arise from factors such as brand reputation, customer loyalty, and proprietary technology (Babalwa, 2024). The theory was used to establish the effect of green tendering on performance of sugar companies in Kenya.

Institutional Theory

Institutional Theory developed by John Meyer and Brian Rowan in the 1970s, within the context of organizational studies and sociology, examines how institutions—both formal (such as laws, regulations, and norms) and informal (such as customs, traditions, and cultural values)—shape organizational behavior, practices, and structures (Othman, 2020). At its core, Institutional Theory suggests that organizations are not only influenced by economic factors or market forces but are also deeply embedded within broader social and institutional contexts. These institutional contexts provide guidelines, norms, and expectations that influence how organizations operate, make decisions, and respond to external pressures (Mogorosi, 2020).

One key concept within Institutional Theory is institutional isomorphism, which describes the tendency of organizations within a field or industry to become more similar over time (Cherotich & Ngugi, 2020). This occurs through three main mechanisms: coercive isomorphism (pressure from external entities such as governments, regulatory bodies, or powerful stakeholders), mimetic isomorphism (imitation of successful practices or behaviors observed in other organizations), and normative isomorphism (adoption of norms and values considered legitimate within the institutional environment). These forces can lead to convergence in organizational structures, practices, and strategies, even among organizations that are otherwise competing in the same industry (Chrisostom & Monar, 2020). Furthermore, Institutional Theory emphasizes the role of legitimacy in organizational survival and success. Legitimacy refers to the perception that an organization's actions, structures, and practices are appropriate, acceptable, and in line with societal expectations and norms. Organizations strive to gain and maintain legitimacy because it enhances their credibility, reduces uncertainty among stakeholders, and facilitates access to resources and support. Legitimacy can be achieved by conforming to institutional expectations, aligning with prevailing norms, and demonstrating social responsibility (Odhiambo & Kihara, 2020).

Institutional Theory in organizational studies is based on several core assumptions that underpin its analysis of how institutions shape organizational behavior and practices (Othman, 2020). One key assumption is that institutions—both formal (such as laws, regulations, and rules) and informal (such as cultural norms, values, and beliefs)—are influential in defining and constraining the actions of organizations. These institutions provide a framework of legitimacy and expectations within which organizations operate, influencing their strategies, decision-making processes, and overall organizational structures (Mogorosi, 2020). Institutional Theory posits that organizations seek to conform to these institutional pressures to gain legitimacy, support, and acceptance from their external environment. Another assumption is the concept of institutional isomorphism, which suggests that organizations within the same field or industry tend to become more similar to one another over time. This convergence occurs through mechanisms such as coercive isomorphism (pressure from external authorities or stakeholders), mimetic isomorphism (imitation of successful practices observed in other organizations), and normative isomorphism (adherence to norms and values deemed legitimate. These forces lead to organizational homogenization and the adoption of practices that are perceived as legitimate within the institutional environment (Cherotich & Ngugi, 2020). The theory was used to assess effect of green inventory control on performance of sugar companies in Kenya.

Conceptual Framework

A conceptual framework is defined as a structure that provides a coherent model of the relationships among the main variables of a study, offering a basis for interpreting the findings (Huang & Yang, 2020). In this study, the conceptual framework in Figure 2.1, illustrated how the independent variables—executive development, technological innovations, Cultural Integration, and supplier engagement—collectively enhance firm performance in Kenya, which is the dependent variable.

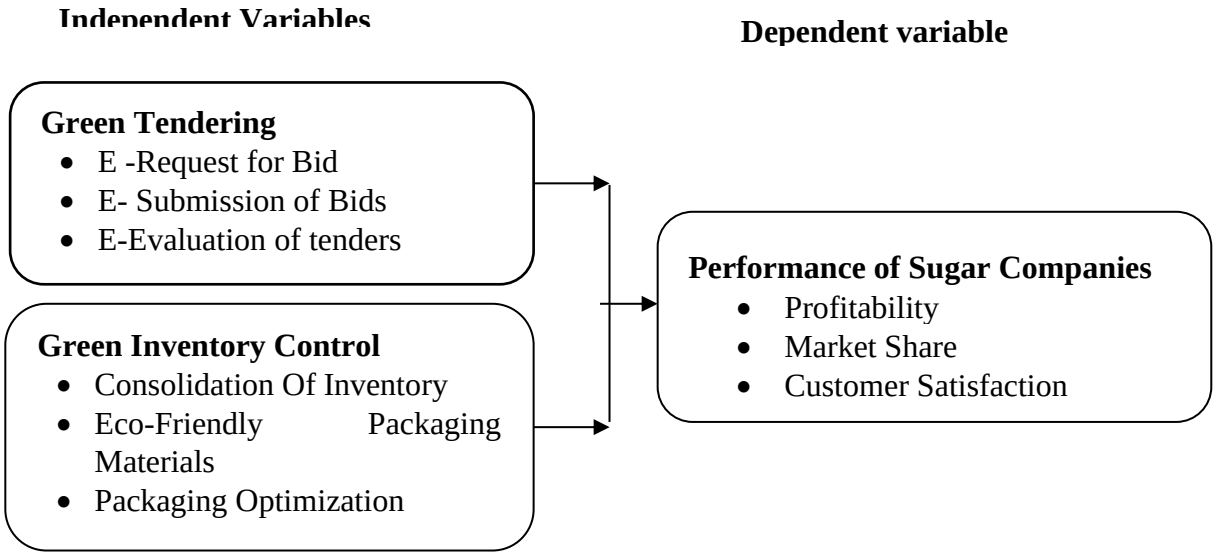

Figure 2. 1: Conceptual Framework

Green Tendering

Green tendering refers to the process of incorporating environmental sustainability criteria into the procurement and tendering process (Bohari & Xia, 2020). It involves selecting suppliers, products, and services based not only on cost and quality but also on their environmental impact. Green tendering encourages the use of eco-friendly materials, energy-efficient technologies, and sustainable production practices to minimize the ecological footprint of the

goods and services procured (Babalwa, 2024). This approach aligns with broader sustainability goals, helping organizations reduce waste, lower carbon emissions, and promote environmental responsibility throughout the supply chain. By prioritizing green practices in tendering, companies and governments can contribute to environmental conservation while fostering innovation in sustainable product and service offerings (Kilonzi & Mwikali, 2022).

E-Request for Bid (E-RFB) is an electronic system used by organizations to invite suppliers and service providers to submit their bids for a specific project or contract (Mutangili, 2020). This process replaces traditional, paper-based bidding systems with a digital platform, making it more efficient and accessible. Through E-RFB, companies or government agencies can provide clear and detailed information about their requirements, specifications, and evaluation criteria (Nasiche & Ngugi, 2020). This method streamlines the communication process, reduces administrative costs, and ensures transparency by allowing all interested parties to access the same information. Additionally, E-RFB systems offer better tracking and accountability, as all bids and related documents are stored electronically. As a result, the process becomes quicker and more secure, ensuring fair competition and timely decision-making (Bohari & Xia, 2020).

E-Submission of Bids refers to the process where suppliers submit their bids electronically, usually through a secure online portal or system (Babalwa, 2024). This method is advantageous for both bidders and organizations as it simplifies the submission process and eliminates the need for physical paperwork. E-submission ensures that bids are submitted within the deadline, and it often includes automated systems to verify the completeness and compliance of the documents before submission. This reduces errors and the risk of human oversight, making the process more reliable. Furthermore, it allows for real-time updates and notifications, keeping both bidders and the organization informed about the status of submissions. The transition to e-submission has improved efficiency, reduced the likelihood of lost or delayed documents, and accelerated the overall tendering process (Kilonzi & Mwikali, 2022).

E-Evaluation of Tenders is the electronic assessment of bids submitted through an e-procurement system. This process allows for a faster and more accurate evaluation of tenders by using automated tools that can analyze various aspects of the bids, such as price, compliance with requirements, technical specifications, and other criteria (Mutangili, 2020). E-evaluation systems enable evaluators to compare multiple bids side by side, which enhance transparency and consistency in the decision-making process. Furthermore, it reduces the potential for human error, bias, and fraud, making the process more objective. E-evaluation also facilitates the generation of detailed reports, providing a clear audit trail of decisions made during the evaluation process. Ultimately, the use of electronic systems for evaluation improves the efficiency, speed, and fairness of the tendering process, ensuring that organizations can select the most qualified and competitive suppliers (Nyaga & Achuora, 2021)

Green Inventory Control

Green inventory control refers to the management of inventory in a way that minimizes environmental impact and promotes sustainability throughout the supply chain (Othman, 2020). This includes practices such as reducing waste, optimizing stock levels to prevent overproduction and excess inventory, and using eco-friendly packaging materials. Green inventory control also involves adopting energy-efficient technologies and practices in warehouses and distribution centers, as well as recycling or repurposing unused or outdated products. By implementing green inventory control, companies can lower their carbon footprint, reduce waste, and contribute to environmental conservation, while also improving operational efficiency and cost-effectiveness. This approach not only benefits the environment but also helps businesses meet consumer demand for sustainable products and services (Mogorosi, 2020).

Consolidation of Inventory refers to the practice of combining or centralizing inventory from multiple locations or suppliers into a single, more efficient storage or distribution system (Cherotich & Ngugi, 2020). This process helps businesses reduce excess stock, minimize storage space, and improve the overall efficiency of inventory management. By consolidating inventory, companies can streamline their supply chain, reduce transportation costs, and improve product availability, all while reducing waste. This practice is especially beneficial for companies looking to adopt more sustainable business models, as it helps decrease the carbon footprint associated with storage and transportation. Additionally, consolidation often leads to better forecasting, fewer overstocking situations, and a more effective utilization of resources, improving overall operational efficiency and profitability (Chrisostom & Monar, 2020).

Eco-friendly Packaging Materials are materials used in the packaging of products that have a minimal environmental impact (Odhiambo & Kihara, 2020). These materials are typically biodegradable, recyclable, or made from renewable resources, and they are designed to reduce waste and pollution. Examples include plant-based plastics, recycled paper, cardboard, and biodegradable films. Using eco-friendly packaging not only helps businesses reduce their environmental footprint but also responds to increasing consumer demand for sustainable products. Companies that adopt eco-friendly packaging practices demonstrate their commitment to sustainability, which can enhance their brand reputation, attract environmentally conscious customers, and meet regulatory requirements aimed at reducing plastic waste and promoting recycling (Othman, 2020).

Packaging Optimization refers to the process of designing and producing packaging that maximizes efficiency while minimizing waste, cost, and environmental impact (Mogorosi, 2020). This involves strategies such as reducing the amount of packaging material used, improving the shape and size of packaging to fit products more efficiently, and ensuring that materials are recyclable or reusable. Packaging optimization can also involve the use of technologies that help streamline the packaging process, reduce material waste, and lower transportation costs by maximizing space usage. By optimizing packaging, businesses can reduce their environmental impact, lower production costs, and improve the overall sustainability of their supply chain, while also meeting consumer expectations for eco-friendly products. This approach not only contributes to a greener environment but also helps businesses stay competitive in an increasingly sustainability-conscious market (Cherotich & Ngugi, 2020).

Empirical Review

Green Tendering and Performance of Sugar Companies

Bohari and Xia (2020) conducted a study on the effect of developing green procurement framework for construction projects in Malaysia. With the current emerging development pattern in Malaysia, Malaysian government has enthusiastically promoted green procurement approach that will help the construction project being green. The study found that this paper discusses the progress to date of a research project aimed at developing a green procurement framework for construction projects in the Malaysian construction industry. This framework will guide the stakeholders to plan the green procurement implementation to procure a construction projects. The study concluded that as revealed by past researches, there is a lacking of guideline currently, specifically at project levels. Policies and general guidelines will drive the demand but there is also a need to provide guidelines at the project levels

Babalwa (2024) conducted a study on the effect of appraisal of the efficiency of green tender adjudication methods in public procurement of construction projects in South Africa. Due to poor performance caused by non-adherence to proper processes and procedures, procurement performance has for decades attracted the attention of practitioners, academics, and researchers. From observations, it was found that the adjudication process has not been adopted properly by procurement stakeholders. The study concluded that Participants' credentials and

experience influence the efficiency of tender adjudication processes in South Africa's public construction project procurement

Kilonzi and Mwikali, (2022). Conducted a study on the factors affecting adoption of green tenders' practices in energy sector in Kenya, A case study of Kenya Pipeline Company. This study sought to determine factors affecting adoption of green procurement practices in energy sector in Kenya; a case study of Kenya Pipeline Company. The target population for the study was 300 employees of Kenya Pipeline Company, from which a sample size of 75 respondents was selected using stratified random sampling method. The study findings were analyzed using quantitative and qualitative methods and presented in form of tables and figures. Based on the findings, the study came to a conclusion that procurement policies are key in adoption of green procurement practices in energy sector in Kenya.

Mutangili (2020) conducted a study on the influence of green tenders practices in supply chain management and leadership on performance of parastatals in Kenya; A case of Kenya airways and Kenya pipeline. The study empirically determines the influence of green procurement practices in supply chain management and leadership on performance of Kenya Airways and Kenya pipeline. It was established that green procurement practices improves overall performance of a firm. Reverse logistics, green distribution, green purchasing, supply selection and green marketing have a significant effect on overall performance of government parastatals. It is concluded that reverse logistics influences the organizational performance through controlling of environmental risks, proper utilization of materials by customers, results to customer satisfaction and ensures recycling of materials.

Nyaga and Achuora (2021) conducted a study on the effect of sustainable procurement practices and performance of green tendering in food and beverages manufacturing firms in Kenya. The study was grounded on organization theory, system theory, legitimacy theory and stakeholder theory. The study used descriptive cross-sectional survey research design to survey one hundred and eight firms sampled stratifically from two hundred and seventeen food and beverage manufacturing firms registered members of Kenya Association of Manufacturers under Nairobi County. Procurement managers were used as the unit of observation. A structured questionnaire was used to collect primary data. The questionnaires were self-administered with assistance from the research assistants. The study revealed that reverse logistics, green specification, green inventory management and green tendering are practiced across the manufacturing firms across Nairobi County. Importantly, the study established that the four sustainable procurement practices (reverse logistics, green specification, green inventory management and green tendering) significantly positively affect procurement performance through reduction of cost, clean environment and increased quality of supplies. Therefore the study concluded that sustainable procurement significantly increases procurement performance with the ultimate positive impact on firm performance

Green Inventory Control and Performance of Sugar Companies

Othman (2020) conducted a case study on green inventory practices and economic value added: an applied study on companies listed on the Qatar stock exchange. Content analysis was used to gather study data. The sustainability reports and all other materials related to green accounting subject published by the study sample during the period (2014-2019) was deeply viewed. The study applied on seven sectors consists of 47 companies listed in the Qatar exchange selected based on data availability. The study also found that there is a statistically significant effect of green accounting on the EVA of listed Qatari companies. The study also found that there is a statistically significant effect of green accounting on EVA of listed Qatari companies. The study concluded that the quality of green accounting practices in the listed Qatar companies was weak, was its average in the banking and financial services sector and the telecommunications sector, whereas it's weak in the insurance and real estate sectors.

Mogorosi (2020) conducted a study on analysis of the inventory management system and controls at Glencore: a case of Rustenburg smelter. This study analyses the inventory management system and controls at Glencore Rustenburg Smelter. The aim of this research is to share practices or/and understanding of employees with regard to inventory management discipline. The findings of this research provide an insight into employees' understanding and competence as well as policies and procedures. In conclusion, the data clearly illustrates that the respondents seem to be clear about what they do in the inventory management and are well conversant with the control systems.

Cherotich and Ngugi (2020) conducted a study on the effect of green inventory management practices on performance of fast-moving consumer goods manufacturers in Nairobi County, Kenya. This study adopted a descriptive research design for the purpose of accessing the study's general intent. The target population was 51 fast moving consumer goods manufacturers in Nairobi County. The study focused on the logistics managers and IT managers of the 51 FMCG manufacturers located in Nairobi as the unit of observation where a census will be conducted on them. Hence a total of 102 respondents were sampled. The study used self-administered questionnaires. Primary data was collected through the administration of questionnaires to respondents. The study found that supplier evaluation is statistically significant to performance of fast-moving consumer goods manufacturers. This is an indication that supplier evaluation had significant positive relationship with performance of manufacturer of fast-moving consumer goods manufacturers. This leads to the conclusion that a unit increase in top management support will result to increase in performance of fast-moving consumer goods manufacturers.

Chrisostom and Monari (2020) conducted a study on the effect of green inventory management on performance of registered automotive firms in Kenya. The study design used was correlational research. The target population for the study was 305 heads of departments of the registered automotive firms in Kenya and a sample of 170 was arrived at using the Fischer's' model. Questionnaires and interview guide were used for collecting primary data. . The study also looked at the overall effect of green procurement practices on performance. The findings revealed that respondents agreed that green procurement practices. Moreover, the regression analysis revealed a moderate degree of positive correlation between green procurement practices and performance which was explained by green procurement practices. The results obtained from this study were important in terms of reflecting the situation on the usage of green logistics management practices and performance of automotive firms in Kenya. The results further revealed a positive relationship between the green logistics management and the firm's performance. The results provide an insight to automotive industry managers on the importance of the use of green logistics management and its effect on performance. The study concluded that that some green procurement practices like green logistics management had a significant effect on performance.

Odhiambo and Kihara (2020) conducted a study on the effect of inventory management practices on supply chain performance of government health facilities in Kisumu County in Kenya. The purpose of this study was to determine the effect of inventory management practices on supply chain performance of government health facilities in Kisumu County. The target population was the 12 government health facilities level 4 and 5 in Kisumu County since they operate under some defined level of semi-self-autonomy that allows them to manage their own inventory and supply chains; which formed the unit of analysis. The unit of observation was 84 comprising of Procurement officers, Stores clerks, Logistics officers and IT employees from those health facilities. Regression analysis results revealed that lean inventory practices, inventory records accuracy and information technology had a significant effect on supply chain performance, while demand forecasting had an insignificant effect on supply chain performance. Based on the findings of the study, the study concluded that lean inventory

practices, inventory records accuracy and information technology had the most significant effect on supply chain performance of government health facilities in Kisumu County

RESEARCH METHODOLOGY

Research Design

Kothari (2018) defines research design as an outline of the actual measures, adopted by an investigator for testing the correlation involving dependent variables as well as independent variables. This study used descriptive research design which involved gathering of data that describes events then organizing, tabulating depicting and describing the data. The choice of this research design was influenced by the fact that it enables the researcher to assess the situation in the study area at the time of study. This design is pertinent in "developing the profile of a situation and a community of people by getting complete and accurate information through an interaction between the researcher and the respondent via data collection tools" (Kothari & Garg, 2004).

Van Manen (2016) states that a descriptive research design as a data collection method from which a sample of individuals being investigated using research instruments by use of data collection instrument which has both the closed-ended and open-ended questions, interviews and observations. It is one of the most widely used non-experimental research designs across disciplines to collect large amounts of survey data from a representative sample of individuals sampled from the targeted population.

Target Population

A population is a well-defined collection of people, services, elements, events, groupings of objects, or homes that are being studied in order to generalize the findings. This study was conducted in sugar companies in Kenya. These companies included; Mumias sugar company, Nzoia Sugar Company, West Kenya Sugar Company, West Kenya-Olepito Sugar Unit, Butali Sugar Company and Busia Sugar Industries. The study targeted Management Employees in procurement and supply chain department in all companies. The employees were targeted since they were involved in the procurement process. In every company, the study focused on 2 top manager, 6 middle level managers and 10 lower level managers. This implies that the total target population was 108 management employees

Table 1: Target Population

Category	Target Population
Top managers	12
Middle Level Managers	36
Lower Level Managers	60
Total	**108**

Sample size and Sampling Technique

The smallest portion of a population that adequately reflects the full group is called a sample (Saunders et al., 2019). Sampling is the process of selecting and analyzing a small number of persons, items, or events in order to determine a characteristic of the total population (Woods, 2019). According to Gay (2015) a sample of 10% is representative however he indicated that a sample more than 10% is better.

No sampling procedures was utilized because the study used a census methodology to collect data from the respondents. A census is a tally of all population elements, as per Kombo and Tromp (2019). When a population is sufficiently small, it is not necessary to sample (Kothari, 2019). The sample size was 108 respondents.

Data Collection Instruments

There are several ways of collecting data which differ considerably in terms of money costs, time and other resources at the disposal of the researcher (Orodho, 2008). The choice of data collection instrument is often very crucial to the success of a research and thus when determining an appropriate data collection method, one has to take into account the complexity of the topic, response rate, time and the targeted population (Mwangi, 2015). Different tools are used to collect different types of data. There is primary data that is collected directly from the respondents; it is information that has never been collected while there are secondary data collection tools that are used to collect secondary data.

This research used a questionnaire to collect primary data. According to Patton *et. al* 2016, a questionnaire is appropriate in gathering data and measuring it against a particular point of view. It provides a standardized tool for data collection. The researcher obtained research permit from relevant authorities required for data collection. Structured and open questions were used to collect primary data from the field. The questionnaires were pilot tested to ascertain the extent to which the instrument is correct and to eliminate ambiguous questions, and improve on validity and reliability

Pilot Study

According to Bashir, (2008), validity refers to the extent to which a test measures what it is supposed to measure and the extent to its truthfulness, accuracy, authenticity, genuineness, or soundness, whether the means of measurement are accurate and whether they are actually measuring what they are intended to measure. The pilot study was carried out on 11 respondents who are sufficient based on Glesne (2015) who stated that 10% of the population was adequate to constitute the pilot test size.

Validity is about the accuracy of the data obtained in the study in representing the variables of the study (Saunders, 2019). Creswell and Garrett(2018) defined validity as to how well an instrument measures what it is intended to measure. The study used open-ended and close-ended questionnaires with Likert scale; another important feature is the population for which the measure is intended, once some of these decisions are made and a measure was developed.

With the support of university supervisors and pilot testing, this study verified the validity of the research instrument. To guarantee that the items in the questionnaire yielded reliable data, the following methods was implemented in this study. Expert opinion: supervisors' comments were incorporated into the instruments to improve their validity; a pre-test study was conducted among the management employees. According to Creswell and Garrett (2018) the consistency of measurement is defined as the degree to which a research instrument yields consistent results or data after repeated trials; reliability is defined as the consistency of measurement.

Data Analysis and Presentation

This study gathered both quantitative and qualitative data. Qualitative data was analysed by use of content analysis. Quantitative data was coded then analysed using Statistical Package for Social Sciences (SPSS) computer software version 28. The choice of the software is influenced by its ability to appropriately create graphical presentation of questions, data reporting, presentation and publishing. SPSS is also able to handle large amount of data and it is purposefully designed for social sciences.
Descriptive statistics was used to analyse the data in frequency distributions and percentages which was presented in tables and figures. Discussions and presentations of the analysed data were done in tables of frequency distribution, percentages, bar graphs and pie charts. Measures of dispersion were used to provide information about the spread of the scores in the distribution.

The study also adopted multiple regression analysis to test the relationships between the variables.

In the study, a statistical model was developed from the conceptual framework as follows: the dependent variable (DV) which in this study was performance of sugar companies in Kenya take the variable [Y], and the coefficients of the independent variables (IV) denoted by X_1, X_2, was used to show the relationship of the independent variables. Statistically, analysis was carried out using the models. The multiple regression model was as follows:

$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \varepsilon$

Where;

Y = dependent variable (performance of sugar companies in Kenya)
X_1 = Green Tendering
X_2 = Green Inventory Control
β_0 = the constant term
β_{1-2} = the Beta coefficient
ε = the error term

RESEARCH FINDINGS AND DISCUSSIONS

Descriptive statistics

Green Tendering and Performance of Sugar Companies

The first specific objective of the study was to establish the effect of green tendering on performance of sugar companies in Kenya. The respondents were requested to indicate their level of agreement on various statements related green tendering and performance of sugar companies in Kenya. The results were as shown Table 2.

From the results, the respondents agreed that electronic request for bids has improved the efficiency of their tendering process (M= 3.781, SD= 0.646). The respondents agreed that green tendering in the request for bids process has enhanced their environmental performance (M=3.770, SD=0.765). Further, the respondents agreed that e-bidding has streamlined their procurement and reduced costs (M=3.668, SD=0.845). The respondents agreed that green tendering in e-bidding has encouraged more sustainable procurement practices (M=3.654, SD= 0.778). The respondents also agreed that e-evaluation has made the tender decision-making process more transparent (M=3.592, SD=0.801). The respondents also agreed that green criteria in e-evaluation have helped them choose more sustainable suppliers (M=3.571, SD=0.692).

Table 2: Green Tendering and Performance of Sugar Companies

	Mean	Std. Deviation
Electronic request for bids has improved the efficiency of our tendering process.	3.781	0.646
Green tendering in the request for bids process has enhanced our environmental performance.	3.770	0.765
E-bidding has streamlined our procurement and reduced costs	3.668	0.845
Green tendering in e-bidding has encouraged more sustainable procurement practices.	3.654	0.778
E-evaluation has made the tender decision-making process more transparent.	3.592	0.801
Green criteria in e-evaluation have helped us choose more sustainable suppliers.	3.571	0.692
Aggregate	**3.689**	**0.762**

Green Inventory Control and Performance of Sugar Companies

The third specific objective of the study was to assess effect of green inventory control on performance of sugar companies in Kenya. The respondents were requested to determine the influence of green inventory control and performance of sugar companies in Kenya. The results were as shown Table 3.

From the results, the respondents agreed that consolidating inventory has improved their warehouse efficiency and reduced waste (M=3.872, SD=0.724). Further, the respondents agreed that using eco-friendly packaging materials has positively impacted their company's environmental performance (M=3.849, SD=0.859). The respondents also agreed that optimizing packaging has helped reduce costs and waste in their operations (M=3.814, SD=0.575). In addition, the respondents agreed that inventory consolidation has enhanced their supply chain performance (M=3.795, SD=0.618). Further, the respondents agreed that eco-friendly packaging materials have improved their company's image and sustainability (M=3.779, SD=0.701). The respondents also agreed that packaging optimization has contributed to better resource utilization and cost savings (M=3.698, SD=0.592).

Table 3: Green Inventory Control and Performance of Sugar Companies

	Mean	**Std. Deviation**
Consolidating inventory has improved our warehouse efficiency and reduced waste.	3.872	0.724
Using eco-friendly packaging materials has positively impacted our company's environmental performance.	3.849	0.859
Optimizing packaging has helped reduce costs and waste in our operations.	3.814	0.575
Inventory consolidation has enhanced our supply chain performance.	3.795	0.618
Eco-friendly packaging materials have improved our company's image and sustainability.	3.779	0.701
Packaging optimization has contributed to better resource utilization and cost savings.	3.698	0.592
Aggregate	**3.801**	**0.678**

Performance of Sugar Companies

The respondents were requested to indicate their level of agreement on various statements related to performance of sugar companies in Kenya. The results were as shown Table 4.7. From the results, the respondents agreed that green practices have improved their company's profitability (M=3.822, SD=0.702). In addition, the respondents agreed that sustainability initiatives have positively impacted their market share (M=3.815, SD=0.718). Further, the respondents agreed that customer satisfaction has increased due to their environmental efforts (M=3.779, SD=0.686). The respondents also agreed that green practices have led to better financial performance for their company (M=3.758, SD=0.795). In addition, the respondent agreed that sustainability efforts have helped them capture a larger market share (M=3.726, SD=0.702). The respondents also agreed that their focus on environmental sustainability has improved customer satisfaction (M=3.696, SD=0.522).

Table 4: Performance of Sugar Companies

	Mean	Std. Deviation
Green practices have improved our company's profitability.	3.822	0.702
Sustainability initiatives have positively impacted our market share.	3.815	0.718
Customer satisfaction has increased due to our environmental efforts.	3.779	0.686
Green practices have led to better financial performance for our company.	3.758	0.795
Sustainability efforts have helped us capture a larger market share.	3.726	0.702
Our focus on environmental sustainability has improved customer satisfaction.	3.696	0.522
Aggregate	**3.766**	**0.688**

Inferential Statistics

Inferential statistics such as correlation analysis and regression analysis were used to assess the relationships between the independent variables (green tendering and green inventory control) and the dependent variable (performance of sugar companies in Kenya).

Correlation Analysis

This research adopted Pearson correlation analysis determine how the dependent variable (performance of sugar companies in Kenya) relates with the independent variables (green tendering and green inventory control). The findings were as depicted in Table 5.

Table 5: Correlation Coefficients

		Performance Of Sugar Companies	Green Tendering	Green Inventory Control
Performance Of Sugar Companies	Pearson Correlation	1		
	Sig. (2-tailed)			
	N	93		
Green Tendering	Pearson Correlation	.873**	1	
	Sig. (2-tailed)	.001		
	N	93	93	
Green Inventory Control	Pearson Correlation	.866**	.232	1
	Sig. (2-tailed)	.002	.045	
	N	93	93	93

From the results, there was a very strong relationship between green tendering and performance of sugar companies in Kenya (r = 0. 873, p value =0.001). The relationship was significant since the p value 0.001 was less than 0.05 (significant level). The findings are in line with the findings of Babalwa (2024) who indicated that there is a very strong relationship between green tendering and performance of sugar companies.

Further, there was a very strong relationship between green inventory control and performance of sugar companies in Kenya (r =0 866, p value =0.002). The relationship was significant since the p value 0.002 was less than 0.05 (significant level). The findings are in line with the findings of Mogorosi (2020) who indicated that there is a very strong relationship between green inventory control and performance of sugar companies.

Regression Analysis

Multivariate regression analysis was used to assess the relationship between independent variables (green tendering and green inventory control) and the dependent variable (performance of sugar companies in Kenya).

Table 6: **Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.877[a]	.769	.770	.10381

a. Predictors: (Constant), green tendering and green inventory control

The model summary was used to explain the variation in the dependent variable that could be explained by the independent variables. The r-squared for the relationship between the independent variables and the dependent variable was 0. 769. This implied that 76.9% of the variation in the dependent variable (performance of sugar companies in Kenya) could be explained by independent variables (green tendering and green inventory control).

Table 7: Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	111.021	2	55.501	248.92	.001[b]
	Residual	19.625	90	.223		
	Total	130.646	92			

a. Dependent Variable: performance of sugar companies in Kenya.
b. Predictors: (Constant), green tendering and green inventory control

The ANOVA was used to determine whether the model was a good fit for the data. F calculated was 248.92 while the F critical was 2.475. The p value was 0.001. Since the F-calculated was greater than the F-critical and the p value 0.001 was less than 0.05, the model was considered as a good fit for the data. Therefore, the model can be used to predict the influence of green tendering and green inventory control on performance of sugar companies in Kenya.

Table 8: Regression Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	0.374	0.096		3.896	0.003
Green Tendering	0.378	0.099	0.377	3.818	0.004
Green Inventory Control	0.373	0.095	0.374	3.926	0.001

The regression model was as follows:

$$Y = 0.374 + 0.378X_1 + 0.373X_2 + \varepsilon$$

According to the results, green tendering has a significant effect on performance of sugar companies in Kenya (β_1=0.378, p value= 0.004). The relationship was considered significant since the p value 0.004 was less than the significant level of 0.05. The findings are in line with the findings of Bohari and Xia (2020) who indicated that there is a very strong relationship between green tendering and performance of sugar companies.

Furthermore, the results revealed that green inventory control has a significant effect on performance of sugar companies in Kenya (β1=0.373, p value= 0.001). The relationship was considered significant since the p value 0.001 was less than the significant level of 0.05. The findings are in line with the findings of Cherotich and Ngugi (2020) who indicated that there is a very strong relationship between green inventory control and performance of sugar companies.

CONCLUSION AND RECOMMENDATIONS

Conclusions of the Study

The study concludes that green tendering has a positive and significant influence on performance of sugar companies in Kenya. Findings revealed that, e -request for bid, e-submission of bids and e-evaluation of tenders influence performance of sugar companies in Kenya.

Further, the study concludes that green inventory control has a positive and significant influence on performance of sugar companies in Kenya. Findings revealed that; consolidation of inventory, eco-friendly packaging materials and packaging optimization influences performance of sugar companies in Kenya.

Recommendations of the Study

The study recommends that the management of sugar companies should embrace green tendering practices, as they have demonstrated a positive and significant influence on overall company performance. By integrating sustainable criteria into the tendering process, companies can not only enhance their environmental responsibility but also improve operational efficiency, reduce costs, and attract environmentally-conscious partners.

Further, the study recommends that the management of sugar companies should strengthen their green inventory control practices, as they have a positive and significant influence on company performance. By consolidating inventory, using eco-friendly packaging materials, and optimizing packaging processes, companies can reduce waste, lower operational costs, and improve supply chain efficiency.

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