Journal of Applied Social Sciences in Business and Management
(JASSBM)
Volume 4, Issue 1, 2025
Journal Homepage: https://grandmarkpublishers.com/index.php/JASSBM

SUSTAINABLE PROCUREMENT PROCESSES AND PERFORMANCE OF MANUFACTURING FIRMS IN NAIROBI CITY COUNTY, KENYA

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ABSTRACT

This study sought to examine the relationship between sustainable procurement practices and performance in manufacturing firms in Nairobi, providing empirical evidence on their effectiveness, challenges, and opportunities. The study employed a descriptive research design, utilizing stratified random sampling to select procurement managers, supply chain officers, sustainability officers, and finance managers from medium and large-scale manufacturing firms in Nairobi County. The target population consisted of 210 manufacturing firms, as documented by the Kenya Association of Manufacturers (KAM, 2024), with a total respondent pool of 840 employees. The sample size was determined using Krejcie and Morgan's formula, ensuring statistical reliability and representativeness. Data was collected using structured questionnaires. Data analysis involved both descriptive and inferential statistics, using SPSS version 28 software. Quantitative data analysis involved descriptive statistics (means, frequencies, and percentages) and inferential statistics (correlation and multiple regression analysis) to establish the relationship between sustainable procurement practices and performance. Pilot testing of the research instrument demonstrated strong validity and reliability. The instrument was validated and reliable for full-scale data collection. This study investigated the influence of sustainable procurement practices on the ESG performance of manufacturing firms in Nairobi County, Kenya. Four core dimensions were examined: procurement-led waste reduction, and ethical procurement practices. Data were collected from 237 respondents using structured questionnaires and analyzed through descriptive statistics, correlation analysis, and multiple regression. The findings revealed that all four procurement practices significantly and positively affect ESG performance, with ethical procurement emerging as the most influential predictor ($B = 0.367$, $p < 0.05$), followed by procurement-led waste reduction ($B = 0.278$, $p < 0.05$). Firms that integrate ESG criteria into procurement processes demonstrated improved environmental compliance, operational efficiency, and stakeholder trust. The study concludes that sustainable procurement is a strategic driver of ESG performance and recommends that firms adopt circular waste reduction models, and embed ethics into procurement governance. These practices collectively enhance transparency, compliance, and long-term sustainability outcomes.

Key Words: Sustainable procurement practices, Environmental, Social, and Governance (ESG) performance, procurement-led waste reduction, ethical procurement practices

Background of the Study

Sustainable procurement has emerged as a critical driver of Environmental, Social, and Governance (ESG) performance in manufacturing firms. As businesses face increasing scrutiny from regulators, investors, and consumers, procurement strategies have evolved beyond cost efficiency to incorporate sustainability considerations (Cek & Ercantan, 2023). ESG-aligned procurement ensures that firms not only comply with environmental and ethical standards but also contribute to long-term value creation and risk mitigation. The integration of sustainability into procurement processes is now widely recognized as a fundamental approach to improving corporate sustainability, enhancing reputation, and achieving regulatory compliance (Meng & Chen, 2023). By embedding ESG principles into procurement decisions, manufacturing firms can align their operations with global sustainability goals and secure a competitive advantage in an increasingly conscious marketplace.

A growing body of research highlights the significant role of sustainable procurement in enhancing ESG outcomes. Procurement-led waste reduction enhances operational efficiency by minimizing material waste and optimizing resource utilization, thereby contributing to both cost savings and environmental sustainability (Sun et al., 2024). Ethical procurement practices, including fair labor policies and anti-corruption measures, foster stakeholder trust and safeguard firms from reputational risks associated with unethical sourcing (Karaman et al., 2024). Collectively, these procurement strategies contribute to improved Performance of manufacturing firms, reinforcing the interconnectedness of sustainable supply chain management and corporate sustainability.

Despite the recognized benefits of sustainable procurement, many manufacturing firms still struggle with implementation due to cost concerns, supply chain complexities, and regulatory uncertainties (Ahmed & Shafiq, 2022). Transitioning to ESG-focused procurement requires firms to reassess supplier relationships, invest in sustainable technologies, and develop stringent compliance mechanisms. Additionally, inconsistent regulatory requirements across global markets pose challenges in standardizing sustainability criteria for suppliers, often resulting in fragmented implementation efforts (Fleck & Povlsen, 2023). Moreover, the lack of comprehensive ESG data and reporting frameworks hinders firms from accurately measuring the impact of their sustainable procurement initiatives (Mukandwal et al., 2020). Addressing these barriers is crucial for manufacturing firms to fully leverage the benefits of sustainable procurement and enhance their Performance of manufacturing firms.

This study examines the impact of sustainable procurement practices on the Performance of manufacturing firms of manufacturing firms, focusing on waste reduction, and ethical procurement. By analyzing these dimensions, the research aims to provide empirical insights into how procurement strategies influence corporate sustainability and governance outcomes. Given the increasing regulatory and market expectations for sustainability integration, understanding the relationship between procurement and Performance of manufacturing firms is essential for firms seeking to enhance their resilience and competitiveness (Wijayanayake et al., 2025). The findings contributes to the existing body of knowledge on sustainable supply chain management and inform best practices for manufacturing firms aiming to improve their sustainability performance.

As manufacturing firms navigate an era of heightened environmental and social responsibility, adopting sustainable procurement is no longer a discretionary initiative but a strategic necessity. Firms that proactively integrate ESG considerations into procurement decisions not only enhances compliance and risk management but also drive innovation, operational efficiency, and long-term financial stability. This study underscores the importance of

sustainable procurement in shaping the future of manufacturing, emphasizing its role in fostering ethical business practices, environmental stewardship, and robust corporate governance.

Statement of the Problem

Despite the increasing emphasis on sustainable procurement as a key driver of Environmental, Social, and Governance (ESG) performance, manufacturing firms in Nairobi, Kenya, continue to exhibit poor ESG outcomes due to weak procurement sustainability frameworks, cost-driven supplier selection, and minimal compliance with ESG reporting standards. While firms recognize the importance of ESG integration, procurement decisions remain largely unaligned with sustainability principles, limiting their ability to enhance environmental performance, ethical sourcing, and governance transparency. This misalignment has resulted in low regulatory compliance, supply chain inefficiencies, and restricted access to ESG-driven investment opportunities.

Data from the Kenya Association of Manufacturers (KAM, 2023) reveals that only 35% of manufacturing firms in Nairobi track Performance of manufacturing firms related to procurement, with over 60% prioritizing cost over sustainability in supplier selection. The Public Procurement Regulatory Authority (PPRA, 2022) reports that less than 25% of procurement contracts in Nairobi's manufacturing sector incorporate ESG criteria, leading to weak supplier accountability, high environmental impact, and governance risks. Additionally, NEMA (2023) data shows that manufacturing contributes 20% of Nairobi's industrial waste, yet only 30% of firms implement procurement-led waste reduction measures. These statistics highlight a major disconnect between procurement policies and Performance of manufacturing firms, undermining sustainability progress in the sector.

The governance aspect of procurement is also a significant concern, with many firms lacking transparency in supplier selection, contract awarding, and ESG reporting. A Kenya Investment Authority (2023) survey found that over 70% of global investors require ESG compliance before engaging with businesses, yet only 25% of manufacturing firms in Nairobi publish ESG reports, limiting their ability to attract investment. The Kenya Institute for Public Policy Research and Analysis (KIPPRA, 2023) further indicates that while ESG frameworks such as ISO 14001 and the Global Reporting Initiative (GRI) exist, only 28% of firms comply, showing a critical gap in procurement-led sustainability reporting.

While studies on ESG adoption in Kenya's corporate sector exist, limited research directly links sustainable procurement to Performance of manufacturing firms in Nairobi's manufacturing firms. Most studies focus on general sustainability strategies (Karaman et al., 2024) or regulatory challenges (Lau et al., 2023), lacking quantitative analysis on how waste reduction, and ethical procurement impact firm-level Performance of manufacturing firms. This study sought to fill this gap by providing data-driven insights into how procurement practices influence ESG outcomes, informing policy development, corporate decision-making, and industry best practices. As Nairobi remains a key manufacturing hub, improving procurement-driven Performance of manufacturing firms is critical for regulatory alignment, competitive advantage, and long-term sustainability.

Objectives of the Study

The main objective of his study was to examine the influence of sustainable procurement processes on Performance of manufacturing firms in Nairobi City County, Kenya.

The study was guided by the following specific objectives;

i. To evaluate the influence of procurement-led waste reduction on performance of manufacturing firms in Nairobi County, Kenya.
ii. To analyze the influence of ethical procurement practices on performance of manufacturing firms in Nairobi County, Kenya.

LITERATURE REVIEW

Theoretical Review

Institutional Theory

Institutional Theory, developed by DiMaggio and Powell (1983), explains how organizations adopt certain behaviors and practices due to institutional pressures from regulatory bodies, industry standards, and societal expectations. The theory posits that firms conform to these expectations through three mechanisms: coercive pressures (legal and regulatory mandates), mimetic pressures (industry benchmarking and competition), and normative pressures (professional and ethical standards) (Scott, 1995). Institutional Theory suggests that firms do not always act purely based on internal strategic goals but often align with external demands to maintain legitimacy, avoid penalties, and enhance stakeholder trust (Hoffman, 1999).

This theory has been widely applied in corporate sustainability studies, particularly in analyzing how environmental laws and social expectations drive firms to adopt waste reduction strategies. Bansal & Clelland (2004) found that companies in highly regulated industries tend to implement waste minimization initiatives to avoid environmental penalties and maintain their corporate reputation. Similarly, Zhu, Sarkis, & Lai (2013) demonstrated that firms operating in regions with strict environmental regulations were more likely to integrate circular economy principles into procurement, invest in resource-efficient materials, and reduce production waste.

Institutional Theory is particularly relevant in waste reduction through procurement, as governments and industry regulators increasingly enforce sustainability compliance requirements. In Kenya, for example, the National Environment Management Authority (NEMA) has imposed strict guidelines on industrial waste disposal, compelling manufacturers to integrate waste reduction strategies in procurement (Kenya Association of Manufacturers, 2023). Additionally, international trade agreements and sustainability certifications such as ISO 14001 and the Global Reporting Initiative (GRI) require firms to demonstrate procurement-driven environmental management efforts, further reinforcing the need for waste reduction initiatives (Wijayanayake et al., 2025).

A key strength of Institutional Theory is its ability to explain why firms in regulated industries prioritize sustainability, even in cases where direct financial benefits are unclear. Unlike theories that focus on internal competitive advantage (e.g., RBV), Institutional Theory highlights how external policy frameworks, global sustainability trends, and investor expectations drive organizations to implement waste reduction measures (Hoffman, 1999). However, the theory has been criticized for assuming that firms are passive entities responding to external pressures, without considering their internal sustainability motivations and strategic choices (Bansal, 2005). Some scholars argue that firms often take proactive sustainability initiatives beyond regulatory compliance, contradicting the notion that institutional pressures alone dictate corporate behavior (DiMaggio & Powell, 1991).

In this study, Institutional Theory is crucial in explaining how regulatory frameworks, environmental laws, and global sustainability pressures influence procurement-driven waste reduction strategies in Nairobi's manufacturing firms. By aligning with waste reduction

policies, firms can enhance ESG compliance, improve resource efficiency, and meet global sustainability standards.

Triple Bottom Line Theory

The Triple Bottom Line (TBL) Theory, introduced by Elkington (1997), expands traditional business performance metrics by emphasizing three key dimensions: People (social impact), Planet (environmental impact), and Profit (economic performance). This theory challenges the conventional corporate focus on financial profitability alone, arguing that firms must integrate social responsibility and environmental stewardship into their business models to achieve long-term sustainability (Slaper & Hall, 2011). TBL Theory suggests that firms that balance these three dimensions can create shared value for both business stakeholders and society while mitigating social and environmental risks (Hahn, Figge, Pinkse, & Preuss, 2010).

TBL has been widely applied in supply chain ethics and responsible sourcing studies, particularly in analyzing how fair trade, labor rights, and anti-corruption measures impact procurement practices. Gimenez, Sierra, & Rodon (2012) found that firms with ethically responsible procurement policies tend to experience lower reputational risks, improved supplier accountability, and enhanced social credibility. Additionally, Jamali (2008) demonstrated that multinational corporations that integrated supplier diversity programs and anti-exploitative sourcing policies achieved higher social sustainability scores and stronger stakeholder engagement.

TBL is particularly relevant in ethical procurement, which focuses on ensuring fair labor conditions, transparency, and corruption-free procurement processes. Many multinational companies in manufacturing now enforce strict supplier codes of conduct to prevent child labor, forced labor, and exploitative wages in supply chains (Porter & Kramer, 2011). In Kenya, for instance, firms that comply with ethical procurement frameworks—such as the SA8000 Social Accountability Standard—have witnessed greater investor confidence and market access (Kenya Investment Authority, 2023). Furthermore, Kenya's Public Procurement and Asset Disposal Act (PPADA, 2015) mandates that procurement decisions include fair competition, transparency, and ethical sourcing, further reinforcing the role of TBL in procurement governance (Wijayanayake et al., 2025).

One of the major strengths of the TBL framework is its ability to provide a holistic sustainability approach that integrates economic, environmental, and social considerations. Unlike profit-focused business models, TBL ensures that firms balance financial returns with ethical procurement and corporate social responsibility (Elkington, 1997). However, TBL has been criticized for its complexity in measuring social and environmental performance alongside financial outcomes. Unlike financial metrics, which have clear numerical indicators, social impact and ethical procurement can be difficult to quantify and subject to subjective interpretations (Slaper & Hall, 2011). Furthermore, firms that prioritize ethical procurement over short-term financial performance may face profitability constraints, particularly in cost-sensitive industries (Hahn et al., 2010).

In this study, TBL is useful in explaining how ethical procurement contributes to Performance of manufacturing firms. Ethical procurement practices—such as supplier transparency, anti-corruption measures, and human rights protection—enhance corporate governance, stakeholder trust, and regulatory compliance in Nairobi's manufacturing sector. By integrating ethical sourcing into procurement decisions, firms can reduce reputational risks, strengthen supplier accountability, and align with global ESG frameworks.

Conceptual Framework

A conceptual framework is an assumed model that aids in the identification of study concepts as well as their interactions with one another (Mugenda & Mugenda, 2019). The conceptual framework for this study illustrates the relationship between sustainable procurement practices and Performance of manufacturing firms in manufacturing firms in Nairobi, Kenya. The independent variables— Procurement-led waste reduction, and Ethical Procurement Practices—are expected to influence Performance of manufacturing firms as the dependent variable. Each independent variable has three distinct and measurable constructs, ensuring that there is no multicollinearity among the variables.

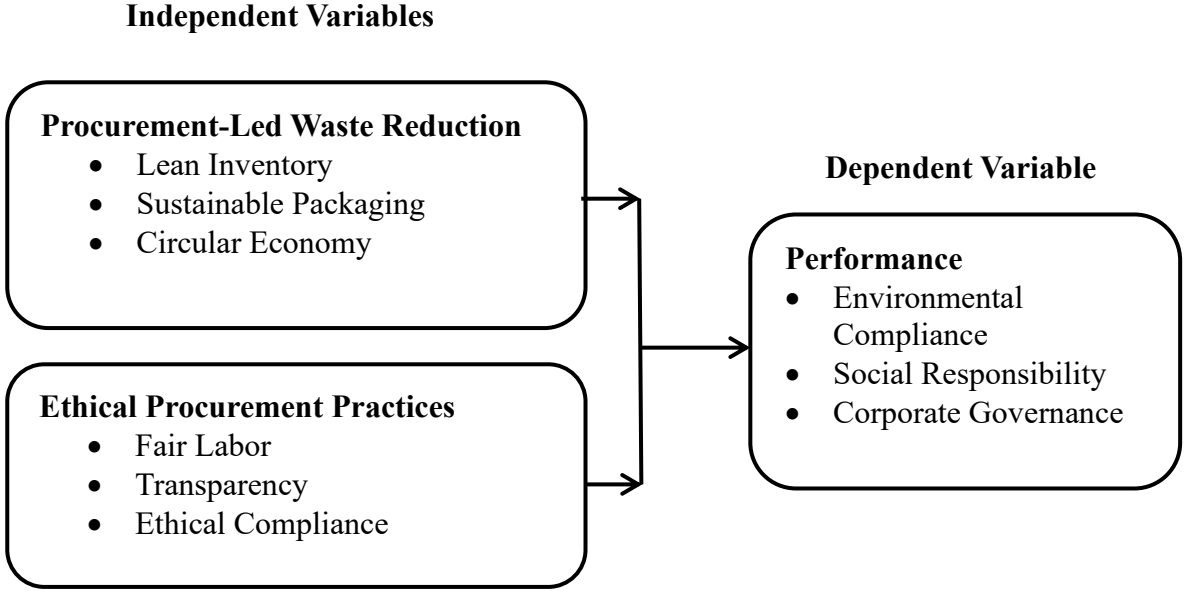

Figure 2. 1: Conceptual Framework

Procurement-led waste reduction

Procurement-led waste reduction refers to the adoption of strategies that minimize waste generation, improve resource efficiency, and integrate circular economy principles. By optimizing material use, reducing packaging waste, and promoting reuse, firms can achieve higher ESG scores and environmental sustainability (Li & Wang, 2024).

The first construct, lean inventory management, involves optimizing procurement to prevent overstocking, reduce material waste, and improve efficiency. Studies show that firms implementing just-in-time (JIT) inventory models significantly reduce procurement-related waste and operational costs (Zheng & Wen, 2024). The adoption of data-driven waste tracking tools has further enhanced firms' ability to manage material flows efficiently and align with ESG reporting frameworks (Burcă et al., 2024).

Another key area of procurement-led waste reduction is sustainable packaging, which focuses on using recyclable, biodegradable, or minimal packaging materials. Research by Alkaraan & Elmarzouky (2025) highlights that firms integrating sustainable packaging solutions experience lower environmental compliance costs and improved consumer perception. This practice aligns with global ESG mandates requiring firms to demonstrate sustainable packaging innovations in their procurement processes. Finally, circular economy practices promote the reuse, refurbishment, and recycling of materials, reducing dependence on virgin resources

(Park, Kim, & Lee, 2022). Ahmed & Shafiq (2022) found that firms adopting circular economy procurement models report higher ESG scores and regulatory compliance while minimizing resource extraction impacts.

Challenges in waste reduction strategies arise from limited access to recycling infrastructure and high initial costs for transitioning to circular economy practices (Kimario et al., 2023). However, firms that adopt lean inventory, sustainable packaging, and circular procurement models enhance operational efficiency, regulatory compliance, and overall Performance of manufacturing firms (Karaman et al., 2024).

Ethical Procurement Practices

Ethical procurement practices refer to the integration of fair labor standards, transparency, and compliance with ethical sourcing certifications into procurement decisions to uphold corporate social responsibility (CSR) and governance ethics (Cek & Ercantan, 2023). These practices ensure that firms prioritize suppliers who adhere to human rights protections, anti-corruption policies, and labor rights compliance. Ethical procurement has gained prominence due to regulatory pressure, investor scrutiny, and consumer demand for corporate accountability, making it a crucial element in enhancing Performance of manufacturing firms (Wei, He, & Wu, 2025).

One of the primary constructs of ethical procurement is fair labor standards, which involves ensuring that suppliers comply with fair wages, safe working conditions, and international labor rights. Studies have shown that firms that enforce supplier labor audits experience fewer reputational risks and legal challenges (Govindan et al., 2021). Research by Zahid et al. (2022) found that manufacturing firms integrating ethical labor policies in procurement report higher social sustainability scores and stronger supplier compliance with international human rights agreements.

Transparency in procurement is another key construct that ensures accountability in supplier selection and contracting. Firms that eliminate bribery, favoritism, and procurement fraud through transparent procurement policies enhance their corporate governance ratings (Tsang, Fan, & Feng, 2023). Empirical studies indicate that companies implementing digital procurement systems, supplier whistleblower policies, and third-party audit mechanisms experience better ESG ratings and stakeholder trust (Karaman, Ellili, & Uyar, 2024).

Compliance with ethical sourcing certifications such as Fair Trade, SA8000, and UN Global Compact principles is another fundamental aspect of ethical procurement. Companies that obtain these certifications demonstrate their commitment to sustainability, human rights, and anti-corruption measures (Zheng & Wen, 2024). Firms with higher ethical procurement compliance are found to be more resilient to regulatory scrutiny and benefit from sustainability-linked investment incentives (Li & Wang, 2024).

Despite the benefits, ethical procurement remains a challenge due to inconsistent supplier adherence to ethical standards, particularly in emerging markets with weak labor and governance policies (Rajesh & Rajendran, 2020). Nonetheless, firms that incorporate fair labor enforcement, procurement transparency, and ethical sourcing compliance into their procurement frameworks enhance their social governance structures and long-term Performance of manufacturing firms (Wang, Hong, & Long, 2023).

Organization Performance

In this study organization performance is considered in terms of Environmental, Social, and Governance. Performance of manufacturing firms refers to how well a firm integrates

environmental responsibility, social sustainability, and corporate governance ethics into its operational and strategic decisions (Alkaraan, Albitar, & Hussainey, 2022). This framework has become a standard for assessing corporate sustainability, particularly in manufacturing firms, where environmental and social impact is significant (Guo, Guo, & Kong, 2023). Performance of manufacturing firms is measured based on three primary constructs: environmental compliance, social responsibility, and corporate governance.

Environmental compliance in Performance of manufacturing firms evaluates a firm's adherence to environmental regulations, waste management practices, and carbon footprint reduction efforts. According to Kimario et al. (2023), firms that integrate green sourcing, waste reduction, and circular economy models into procurement experience higher environmental sustainability scores. Manufacturing companies implementing low-carbon logistics and energy-efficient supply chain practices significantly reduce GHG emissions and regulatory liabilities (Burcă et al., 2024).

Social responsibility assesses a company's commitment to fair labor practices, supplier diversity, and community engagement. Firms that adopt supplier human rights audits, diversity procurement strategies, and fair wage policies enhance their social impact metrics (Chong, 2024). Research by Park, Kim, & Lee (2022) found that firms demonstrating social procurement responsibility attract more ESG-conscious investors and consumer loyalty. Additionally, firms investing in community-driven sourcing initiatives report stronger corporate reputation and workforce stability (Li & Wang, 2024).

Corporate governance, the third pillar of ESG, focuses on a company's transparency, accountability, and ethical decision-making in procurement and supply chain management. Governance compliance involves eliminating bribery, enforcing supplier due diligence, and integrating digital procurement oversight mechanisms (Wei, He, & Wu, 2025). Studies show that firms with robust governance in procurement processes experience lower fraud risks, enhanced investor confidence, and better sustainability-linked financial performance (Nenavani, Prasuna, & Kumar, 2024).

Empirical research highlights a strong correlation between Performance of manufacturing firms and firm financial success. A study by Rajesh & Rajendran (2020) found that companies with high ESG scores outperform competitors in long-term profitability, shareholder value, and brand equity. Additionally, Wang et al. (2023) reported that firms with higher ESG compliance were more resilient during economic downturns and supply chain disruptions due to their risk mitigation strategies.

Despite the growing emphasis on ESG, challenges persist in standardized reporting, measurement consistency, and enforcement of ESG compliance across global supply chains (Cek & Ercantan, 2023). However, firms that effectively implement environmental, social, and governance frameworks in their procurement and operations enhance long-term value creation, regulatory alignment, and corporate sustainability performance (Wei et al., 2025).

Empirical Review

Procurement-led waste reduction

A study by Li and Wang (2024) investigated the impact of waste reduction policies in procurement on the Performance of manufacturing firms of 500 manufacturing firms in China. Using regression analysis, the study found that firms implementing waste reduction procurement strategies reported a 25% improvement in Performance of manufacturing firms and 20% cost savings. The findings revealed that just-in-time (JIT) procurement, automation in inventory management, and supplier collaboration on waste minimization significantly

contributed to lower procurement-related waste levels. The authors emphasized that companies incorporating AI-driven waste tracking systems had better waste management efficiencies than those using traditional procurement models.

Alkaraan and Elmarzouky (2025) conducted an empirical study on sustainable packaging in procurement among 200 manufacturing firms in Europe. Their findings showed that companies investing in sustainable packaging reduced waste generation by 30% and improved governance compliance. The study revealed that firms using biodegradable and recyclable packaging materials experienced higher consumer satisfaction and regulatory compliance. Additionally, companies adopting eco-friendly packaging solutions gained better market positioning and competitive advantage in ESG-driven industries.

Another critical area of procurement-led waste reduction is circular economy adoption, which promotes reuse, refurbishment, and recycling of materials instead of traditional linear procurement models (Burcă et al., 2024). A study by Burcă et al. (2024) analyzed the financial implications of transitioning supply chains toward circular procurement models. The study found that firms integrating circular economy principles in procurement experienced an 18% increase in sustainability-linked investments. The authors emphasized that the adoption of circular procurement strategies not only reduces waste but also enhances long-term profitability and supply chain resilience.

Digitalization and AI-driven procurement waste tracking systems have also been explored in recent studies. Moreira and Rodrigues (2023) investigated the role of AI in waste reduction strategies in the supply chains of 300 manufacturing firms in Latin America. Their findings showed that firms implementing AI-driven waste tracking reduced procurement inefficiencies by 22% and improved ESG ratings. AI-enhanced waste reduction systems allowed firms to optimize inventory levels, forecast demand more accurately, and reduce over-purchasing of raw materials, leading to significant cost savings.

Finally, Park, Kim, and Lee (2022) studied green supply chain management and procurement-led waste reduction in electronics manufacturing. Their research revealed that firms focusing on waste reduction strategies in procurement improved Performance of manufacturing firms and business profitability. The authors found that waste minimization practices, such as lean procurement models and material efficiency programs, contributed to a 25% reduction in supply chain waste levels. The study highlighted that regulatory policies play a crucial role in enforcing waste reduction standards in procurement and recommended that governments introduce mandatory sustainability benchmarks for procurement operations.

Ethical Procurement Practices

A study by Fattahi Bafghi (2024) investigated how blockchain technology enhances ethical procurement transparency in manufacturing supply chains. The study combined case study analysis and empirical research on 100 European manufacturing firms integrating blockchain into procurement operations. Findings revealed that firms leveraging blockchain technology in procurement reduced procurement-related fraud by 32% and improved supply chain traceability. The study also found that blockchain-enabled procurement platforms allowed companies to track supplier labor conditions and environmental compliance in real time, leading to higher ethical sourcing scores.

Another study by Govindan et al. (2021) examined the role of fair labor standards in ethical procurement practices in Asian manufacturing firms. Using survey data from 250 firms, the study found that firms enforcing fair labor policies in procurement contracts had 28% fewer supplier-related ESG violations and a 20% increase in stakeholder trust. The study emphasized

the importance of third-party supplier audits, ethical sourcing certifications, and whistleblower mechanisms in preventing labor rights abuses in global supply chains.

Tsang, Fan, and Feng (2023) conducted a longitudinal analysis on procurement transparency in Chinese manufacturing firms. Their study, which analyzed five years of procurement data from 150 firms, found that companies implementing transparency policies in supplier selection reduced procurement corruption risks by 40%. Additionally, firms that adopted digital procurement platforms and third-party auditing mechanisms saw significant improvements in ESG governance scores. The study recommended that companies increase supplier transparency requirements in procurement contracts to mitigate fraud risks.

Zheng and Wen (2024) examined the impact of ethical sourcing certifications on ESG compliance in automotive and electronics manufacturing firms. The study found that companies obtaining ethical procurement certifications such as Fair Trade, SA8000, and UN Global Compact principles achieved higher ESG governance scores and lower supplier-related compliance violations. The authors noted that firms with strong ethical sourcing frameworks experienced stronger consumer loyalty and reduced reputational risks.

Finally, Li and Wang (2024) explored ethical procurement's role in reducing supplier non-compliance in global supply chains. Using panel data analysis of 300 firms operating in Europe, North America, and Asia, the study found that firms enforcing anti-bribery and anti-corruption clauses in procurement contracts had 35% fewer supplier-related ethical violations. The study also highlighted that companies integrating supplier ethics training programs into procurement operations improved their Performance of manufacturing firms ratings by 18%.

RESEARCH METHODOLOGY

This study adopted a descriptive research design, which is suitable for analyzing relationships between variables in a real-world setting. According to Saunders, Lewis, and Thornhill (2019), a descriptive research design helps in establishing associations between different variables without manipulating them. In this study, the target population consists of manufacturing firms in Nairobi County, Kenya, as documented by the Kenya Association of Manufacturers (KAM, 2024). The unit of analysis is the manufacturing firms, as the study focuses on their procurement practices and Performance of manufacturing firms. The unit of observation, from which data was collected, consists of procurement managers, supply chain officers, sustainability officers, and finance managers within these firms. According to Cooper & Schindler (2018), the unit of observation refers to the individuals or entities from which information is obtained. As per KAM (2024), there are 210 registered large and medium-sized manufacturing firms in Nairobi County.

Since the study targets four key respondents per firm—procurement managers, supply chain officers, sustainability officers, and finance managers—the total target population is 840 employees. This ensures that insights are drawn from individuals directly involved in procurement and sustainability decisions within the firms. The study's sample size was reached at using Krejcie and Morgan sample size determination formula (Russell, 2013). Using this formula a representative sample was obtained.

Table 1: Sample Size

Category	Number of Firms	Population	Sample Size
Building, Mining, and Construction	5	20	6
Food, Tobacco, and Beverage	45	180	57
Chemical and Allied	29	116	36
Energy, Electrical, and Electronics	18	72	23
Plastic and Rubber	30	120	38
Textile and Apparels	24	96	30
Timber, Wood, and Furniture	12	48	15
Pharmaceutical and Medical Equipment	12	48	15
Leather and Footwear	7	28	9
Motor Vehicle and Accessories	8	32	10
Paper and Board	20	80	25
Total	**210**	**840**	**264**

The 264 respondents were chosen with the help of stratified random sampling technique. One of the advantages of stratified random sampling is that it allows for each of the strata to be well represented when the sample is chosen (Bryman & Cramer, 2018). The study then used simple random sampling to select respondents from each group. This study used semi-structured questionnaires to collect the primary data for the study.

Quantitative and qualitative data was generated from the closed-ended and open-ended questions, respectively. Qualitative data was analysed on thematic basis and the findings provided in a narrative form. Inferential and descriptive statistics were employed for analysis of quantitative data with the assistance of Statistical Package for Social Sciences (SPSS version 28). Descriptive statistics such as frequency distribution, mean (measure of dispersion), standard deviation, and percentages were used.Inferential data analysis was conducted by use of Pearson correlation coefficient, and multiple regression analysis

RESEARCH FINDINGS AND DISCUSSION

For this study, a total of 264 questionnaires were distributed to procurement officers, sustainability managers, supply chain officers, and finance managers across manufacturing firms in Nairobi County. Out of these, 243 questionnaires were returned, and 237 were deemed valid and usable for analysis, yielding an effective response rate of 89.77%. According to Mugenda and Mugenda (2003), a response rate of 50% is adequate, 60% is good, and 70% and above is very good for quantitative studies.

Descriptive Analysis

This section presents the descriptive statistical analysis of the study variables based on responses from the structured questionnaire. The purpose of descriptive analysis is to summarize the data using measures such as means and standard deviations, which offer a snapshot of how respondents perceive and rate various dimensions of sustainable procurement practices and Performance of manufacturing firms within their firms. The findings are organized according to the study's independent variables: Procurement-led waste reduction, and Ethical Procurement Practices, followed by the dependent variable, Performance of manufacturing firms.

Procurement-led waste reduction

The first objective of the study was to evaluate the influence of procurement-led waste reduction on the performance of manufacturing firms in Nairobi County, Kenya. This subsection presents the descriptive analysis for the third independent variable: procurement-led waste reduction. This construct explores the extent to which firms implement practices aimed at minimizing material and process-related waste across their procurement operations. Respondents were asked to indicate their level of agreement with eight statements using a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Table 2 presents the mean scores and standard deviations for each item, revealing how effectively waste management strategies have been adopted within procurement departments.

Table 2: Descriptive Statistics for Procurement-led waste reduction

Statement	Mean Score	Standard Deviation
We conduct regular waste audits in our procurement process.	4.419	0.548
We prioritize suppliers who use recyclable and reusable materials.	3.830	0.792
We have adopted a circular economy model in procurement.	3.775	1.079
Our firm actively reduces excess packaging in sourced products.	3.564	0.736
Our company has implemented lean inventory management to minimize waste.	3.548	0.908
Our suppliers are required to provide documented waste management plans.	3.489	0.854
We invest in technologies that track and reduce procurement waste.	3.430	0.722
Our firm follows government waste reduction policies in procurement.	3.402	0.774
Aggregate Score	**3.682**	**0.802**

The most widely practiced waste reduction measure was the conduct of regular waste audits, which scored 4.419 (0.548). This indicates that firms are actively monitoring their procurement processes to identify inefficiencies and minimize waste. Prioritizing suppliers who use recyclable and reusable materials followed with a mean of 3.830 (0.792), reflecting an upstream approach to waste minimization through supplier collaboration. Adoption of the circular economy model in procurement had a mean of 3.775 (1.079). While this indicates considerable uptake, the high variability suggests uneven implementation across firms. Reducing excess packaging in sourced products scored 3.564 (0.736), highlighting moderate commitment to minimizing waste at the product handling stage.

The use of lean inventory management systems was also moderately rated at 3.548 (0.908), suggesting some reliance on demand forecasting and inventory optimization to reduce overstocking. Requiring documented waste management plans from suppliers received a score of 3.489 (0.854), indicating this is encouraged but not universally enforced. Investment in waste tracking technologies scored 3.430 (0.722), showing that while technology is being adopted, it may still be limited by cost or capacity. The lowest score was recorded for following government waste reduction policies in procurement, with a mean of 3.402 (0.774), reflecting that adherence to external regulations may not yet be a priority for all firms.

The aggregate mean score of 3.682 (0.802) shows that firms generally agree with the adoption of waste reduction practices in procurement, although the intensity and consistency vary across specific strategies. This aligns with the findings of Li and Wang (2024), who reported that manufacturing firms implementing lean inventory systems, circular procurement, and supplier collaboration achieved a 25% improvement in Performance of manufacturing firms. Similarly, Burcă et al. (2024) emphasized that integrating circular economy principles led to more sustainable and financially efficient procurement systems. Moreover, Moreira and Rodrigues (2023) highlighted the role of AI in improving waste tracking and inventory optimization. Collectively, the literature reinforces the view that procurement-led waste reduction enhances both environmental performance and operational efficiency, supporting the study's hypothesis that it positively contributes to ESG outcomes in manufacturing firms.

Ethical Procurement Practices

The second objective of the study was to analyze the influence of ethical procurement practices on performance of manufacturing firms in Nairobi County, Kenya. This subsection presents the descriptive analysis for the fourth independent variable: ethical procurement practices. The construct assesses the extent to which firms integrate ethical standards—such as transparency, fair labor, and anti-corruption—into their procurement activities. Respondents were asked to rate eight statements on a five-point Likert scale from 1 (Strongly Disagree) to 5 (Strongly Agree). Table 3summarizes the mean scores and standard deviations for each item, offering insight into how firms apply ethical considerations in their procurement operations.

Table 3: Descriptive Statistics for Ethical Procurement Practices

Statement	Mean Score	Standard Deviation
Our company enforces anti-corruption policies in procurement.	4.487	0.644
Supplier contracts include ethical sourcing commitments.	4.255	0.740
We ensure fair labor practices in our supply chain.	4.099	0.827
We have mechanisms to monitor supplier human rights compliance.	3.395	0.929
Our firm follows fair trade principles in procurement decisions.	3.322	1.002
We conduct third-party ethical audits of suppliers.	3.496	0.843
Employees involved in procurement receive training on ethical sourcing.	3.714	0.780
Our company ensures supplier payment terms are fair and transparent.	3.891	0.765
Aggregate Score	**3.832**	**0.816**

The highest-rated item was the enforcement of anti-corruption policies in procurement, with a strong mean of 4.487 (0.644). This suggests that firms take a clear stance against unethical practices and likely have compliance frameworks in place. Ethical sourcing clauses in supplier contracts followed with a mean of 4.255 (0.740), indicating that procurement agreements explicitly address ethical standards and obligations. Ensuring fair labor practices across the supply chain scored 4.099 (0.827), reflecting the importance of human rights in procurement strategies. The transparency of supplier payment terms received a mean of 3.891 (0.765), suggesting a solid commitment to equitable financial dealings with suppliers.

Procurement training on ethical sourcing for employees had a mean of 3.714 (0.780), demonstrating moderate adoption of internal education and capacity building. The use of third-

party ethical audits was rated at 3.496 (0.843), indicating that while some firms invest in external validation, it may not be standard across the sector.

Mechanisms to monitor supplier human rights compliance had a lower mean of 3.395 (0.929), suggesting this area is less developed or inconsistently applied. Finally, the lowest score was reported for the integration of fair trade principles, with a mean of 3.322 (1.002), possibly reflecting limited awareness or availability of fair trade-certified suppliers in the local context.

The aggregate mean score of 3.832 (0.816) indicates that, on average, firms practice ethical procurement at a moderately high level. The strong emphasis on anti-corruption, contract-based ethical clauses, and labor rights reflects an encouraging level of integrity and compliance within procurement systems. These findings are supported by the empirical review. For instance, Fattahi Bafghi (2024) showed that anti-corruption and blockchain-enhanced transparency reduced procurement fraud by 32%. Similarly, Govindan et al. (2021) found that enforcement of fair labor practices led to fewer supplier violations and stronger stakeholder trust. Additionally, Tsang, Fan, and Feng (2023) emphasized the value of procurement transparency mechanisms in improving governance and ethical compliance. These studies affirm that ethical procurement strengthens ESG governance, mitigates reputational risk, and enhances supplier accountability—outcomes clearly aligned with the practices observed in this study.

Performance of Manufacturing Firms

The main objective of his study was to examine the influence of sustainable procurement processes on Performance of manufacturing firms in Nairobi City County, Kenya. This section evaluates how respondents rated their organization's performance on key environmental, social, and governance (ESG) indicators. The analysis provides a snapshot of how sustainability practices have translated into tangible outcomes such as regulatory compliance, stakeholder recognition, community engagement, and financial benefits. Eight statements were used to measure Performance of manufacturing firms, and respondents were asked to rate them on a five-point Likert scale from 1 (Strongly Disagree) to 5 (Strongly Agree). Table 4.9 presents the mean scores and standard deviations for each performance indicator.

Table 4: Descriptive Statistics for Performance of manufacturing firms

Statement	Mean Score	Standard Deviation
Our procurement activities have led to measurable reductions in resource consumption (energy, water, raw materials).	4.455	0.506
We engage in community-driven sustainability initiatives.	4.180	0.554
Our company complies with environmental regulations.	4.107	0.605
Our company regularly reports on Performance of manufacturing firms metrics.	3.940	1.057
We have a clear ESG policy guiding procurement decisions.	3.910	0.774
Our corporate governance is aligned with ESG principles.	3.883	0.806
ESG compliance influences our financial performance positively.	3.798	0.902
Investors and stakeholders recognize our sustainability efforts.	3.665	0.948
Aggregate Score	**3.992**	**0.769**

The highest-rated statement was that procurement activities have led to measurable reductions in resource consumption, with a mean of 4.455 (0.506). This indicates that respondents widely agree their sustainable procurement efforts are yielding tangible environmental benefits.

Following this, engagement in community-driven sustainability initiatives received a score of 4.180 (0.554), reflecting strong social involvement across firms. Environmental regulatory compliance also scored highly at 4.107 (0.605), suggesting that most firms meet or exceed environmental requirements. Regular reporting on Performance of manufacturing firms received a mean of 3.940 (1.057), which, although generally positive, reflects some inconsistency in disclosure practices across firms.

The presence of a clear ESG policy guiding procurement decisions had a mean of 3.910 (0.774), indicating that many firms have policy frameworks, though implementation may vary. Similarly, corporate governance aligned with ESG principles was rated at 3.883 (0.806), reflecting moderately strong adherence to governance standards. The belief that ESG compliance positively influences financial performance scored 3.798 (0.902), showing that while many firms see a financial benefit, this link is not universally perceived. The lowest score, 3.665 (0.948), was for stakeholder and investor recognition of sustainability efforts, indicating that some firms may still struggle to communicate or demonstrate their ESG impact externally.

The aggregate mean score of 3.992 (0.769) indicates that respondents generally agree their organizations perform well on key ESG dimensions. This suggests that the adoption of sustainable procurement practices—ranging from eco-friendly sourcing and waste reduction to ethical contracting—has positively impacted environmental compliance, community engagement, and resource efficiency among manufacturing firms in Nairobi County. These findings are strongly supported by the literature in Section 2.4. For instance, Li and Wang (2024) found that procurement-led waste reduction strategies significantly improved ESG scores and generated cost savings. Furthermore, Govindan et al. (2021) emphasized the role of ethical procurement in reducing supplier violations and strengthening stakeholder trust. The convergence between these empirical findings and the study's results underscores that sustainable procurement is not only a driver of ESG alignment but also a strategic asset in enhancing organizational reputation, operational efficiency, and long-term competitiveness.

Correlation Analysis

This section presents the results of the correlation analysis, which was conducted to examine the nature and strength of the linear relationships between the independent variables and the dependent variable, Performance of manufacturing firms. To guide interpretation, the study adopted Cohen's (1988) recommended scale, where a coefficient between 0.10 and 0.29 is considered weak, 0.30 to 0.49 moderate, 0.50 to 0.69 strong, 0.70 to 0.89 very strong, and 0.90 to 1.00 extremely strong.

Table 5: Correlations

		Performance of manufacturing firms	Procurement-led waste reduction	Ethical Procurement
Performance of manufacturing firms	Pearson Correlation	1		
	Sig. (2-tailed)			
	N	237		
Procurement-led waste reduction	Pearson Correlation	.666**	1	
	Sig. (2-tailed)	.038		
	N	237	237	
Ethical Procurement	Pearson Correlation	.789**	.270	1
	Sig. (2-tailed)	.026	.087	
	N	237	237	237

The strongest positive relationship was observed between ethical procurement practices and of manufacturing firms, with a very strong correlation of r = 0.789 (p = 0.026). This suggests that firms that enforce anti-corruption policies, promote fair labor standards, and integrate ethics into supplier agreements tend to perform better in terms of ESG. This finding aligns with Fattahi Bafghi (2024), who reported that ethical procurement enhanced transparency and reduced supplier-related fraud by 32%, leading to improved governance scores. Similarly, Govindan et al. (2021) emphasized that ethical labor practices and procurement integrity boost stakeholder trust and reduce ESG violations, reinforcing the critical role of ethics in sustainable supply chain management.

Procurement-led waste reduction was the second strongest predictor, showing a strong correlation of r = 0.666 (p = 0.038) with performance of manufacturing firms. This indicates that firms that implement lean inventory systems, reduce packaging, and invest in circular procurement models experience significant improvements in sustainability outcomes. This result supports Li and Wang (2024), who found that waste-reduction strategies improved ESG performance by 25% while also reducing operational costs. In addition, Burcă et al. (2024) emphasized that firms adopting circular economy practices not only minimized waste but also attracted sustainability-linked investments, contributing to long-term ESG growth.

Multiple Regression Analysis

Table 6 presents the regression coefficients for the multiple regression model used to predict ESG performance based on sustainable procurement practices: procurement-led waste reduction, and ethical procurement.

Table 6: Coefficients of Study Variables

Variable	Unstandardized Coefficient (B)	Std. Error	t-value	Sig. (p-value)
Constant	4.036	0.334	12.084	0.000
Procurement-led waste reduction	0.278	0.032	8.688	0.000
Ethical Procurement Practices	0.367	0.043	8.535	0.000

Procurement-led Waste Reduction (B = 0.278, $p < 0.05$). The unstandardized coefficient for procurement-led waste reduction was 0.278. This suggests that a one-unit increase in procurement waste minimization efforts leads to a 0.278-unit improvement in ESG performance. This reinforces the idea that firms employing lean inventory systems, circular procurement models, and waste audits benefit from stronger ESG metrics. These findings resonate with Li and Wang (2024), who found a 25% improvement in ESG outcomes for firms that implemented waste reduction strategies in procurement. Additionally, Burcă et al. (2024) reported that circular procurement models increased sustainability-linked investments, while Moreira and Rodrigues (2023) emphasized the role of AI-driven waste tracking in optimizing procurement and enhancing ESG ratings.

Ethical Procurement Practices (B = 0.367, $p < 0.05$). Ethical procurement practices had the largest overall effect in the model, with a coefficient of 0.367, indicating that enhancing transparency, anti-corruption policies, fair labor practices, and fair-trade principles significantly boosts ESG performance. A one-unit increase in ethical procurement corresponds to a 0.367-unit increase in ESG performance, all else being equal. This finding is strongly supported by Fattahi Bafghi (2024), who reported a 32% reduction in procurement fraud and improved traceability with the implementation of ethical sourcing frameworks. Govindan et al. (2021) also found that enforcing fair labor policies and supplier audits increased stakeholder

trust and reduced ESG violations. The strength of this predictor underscores that governance and ethics are critical levers for sustainable value creation.

Optimal Regression Model

Based on the results presented, the final fitted multiple linear regression model for predicting performance of manufacturing firms is:

$$\textit{Performance of manufacturing firms} = 4.036 + 0.278\ \textit{Procurement-led Waste Reduction} + 0.367\ \textit{Ethical Procurement Practices} + \varepsilon$$

Conclusions

The findings also underscore that procurement-led waste reduction is a critical driver of ESG performance. Firms that implement lean inventory management, reduce excess packaging, and adopt circular procurement models demonstrate higher levels of efficiency and environmental responsibility. Waste reduction is therefore concluded to be both a sustainability strategy and a means to enhance operational effectiveness and regulatory compliance within procurement functions.

Finally, the study finds that ethical procurement practices have the most substantial influence on ESG performance. Companies that enforce anti-corruption policies, uphold fair labor practices, and ensure transparency in supplier relationships create a strong foundation for governance integrity and social accountability. Ethical procurement emerges as not only a compliance mechanism but also a strategic pillar that elevates ESG alignment and strengthens the organization's credibility and stakeholder trust.

Recommendations

Procurement-led Waste Reduction

Firms should strengthen their waste reduction efforts by adopting circular procurement principles, which emphasize product lifecycle thinking, reuse, and material recovery. This includes formalizing requirements for suppliers to use recyclable, reusable, or biodegradable packaging and mandating submission of waste management plans as part of the contract compliance process.

Investment in technology-based waste monitoring systems, such as IoT-enabled inventory trackers and AI-powered demand forecasting, should be prioritized to minimize overstocking and material wastage. These tools enable real-time data collection that informs procurement adjustments, reduces excess purchasing, and enhances resource efficiency.

Additionally, companies should collaborate with regulators and industry bodies to align with national waste reduction targets and participate in shared initiatives such as sectoral recycling programs or eco-industrial parks. This collective approach ensures compliance, strengthens reputation, and enhances ESG performance through economies of scale in waste management.

Ethical Procurement Practices

Given its dominant influence on ESG performance, ethical procurement should be elevated to a strategic function within organizational governance. Companies must embed clear ethical standards into all procurement documentation, including anti-bribery clauses, labor rights requirements, and transparent grievance mechanisms.

To enhance enforcement, firms should require third-party ethical audits of suppliers at regular intervals. This will help uncover potential violations and strengthen due diligence processes. Furthermore, all procurement personnel should undergo mandatory ethics and compliance

training, focused on identifying and addressing risks related to corruption, discrimination, labor exploitation, and unfair trade.

Fair treatment of suppliers must also be a core priority. Companies should adopt transparent and timely payment practices, particularly for small and minority-owned suppliers, to build equitable and trusted supply chain partnerships. Lastly, creating anonymous whistleblower platforms will encourage the reporting of unethical procurement behavior, protecting the integrity of the process and improving public confidence in the firm's ESG commitments.

Suggestions for Further Studies

This study focused exclusively on manufacturing firms in Nairobi County. Future research could explore sustainable procurement practices in other sectors such as retail, construction, or healthcare, or compare urban vs. rural procurement environments. Additionally, longitudinal studies could evaluate the long-term effects of ESG-oriented procurement on firm profitability, investor behavior, and innovation adoption across the supply chain.

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