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EFFECTS OF ADOPTING GREEN PROCUREMENT PRACTICES ON ORGANIZATION ENVIRONMENTAL PERFORMANCE IN TEA INDUSTRIES IN MERU COUNTY

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ABSTRACT

This study investigates the impact of adopting green procurement practices on the environmental performance of tea processing industries in Meru County, Kenya. The research specifically focuses on four critical areas: green supplier selection, green manufacturing, green logistics, and the incorporation of renewable energy sources. Data were collected from a sample of 321 respondents, including managers, departmental heads and staff from nine tea processing factories. Primary data was gathered through structured questionnaires and face-to-face interviews, while secondary data were obtained from existing literature. The study also included a pilot study conducted in Kericho County with 34 respondents representing 10% of the sample size. The findings revealed that the selection of green suppliers was found to significantly reduce environmental degradation, the adoption of green manufacturing practices led to enhanced resource efficiency and minimized waste production, the implementation of green logistics practices resulted in a substantial reduction in the carbon footprint of the tea processing factories and improved operational efficiency and that the incorporation of renewable energy sources was found to significantly lower greenhouse gas emissions and reduce energy costs. The data were analyzed using descriptive statistics, regression analysis, and correlation tools to establish the relationships between green procurement practices and environmental performance. The main software used for the analysis was the latest version of SPSS. The study concludes that the adoption of green procurement practices not only enhances environmental sustainability but also provides a competitive advantage for tea processing industries in the global market. The research recommends that industry stakeholders prioritize the enforcement and adoption of these practices to achieve long-term sustainable development. Future studies should investigate the long-term economic and environmental impacts of green procurement practices across various agricultural sectors.

Key words: *green supplier selection, green manufacturing, green logistics, renewable energy sources*

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INTRODUCTION

The complexity arising from climate change in the business environment necessitates a multi-dimensional approach, as it impacts various aspects including environmental sustainability, social responsibility, operational efficiency and economic performance as highlighted by Qorri et al. (2018). The world-wide trend favors environmentally sustainable practices and numerous organizations have embraced this concept through initiatives known as green practices (Xie & Breen, 2012). In addition to this, Nimawat and Namdev (2012) in their study emphasized the importance of embracing environmentally responsible practices in both production and consumption. They highlighted that such efforts can lead to improved environmental quality, poverty reduction and economic growth. Moreover, they pointed out that adopting these practices can also enhance working conditions and promote sustainability. Meru County's tea sector is an important element of Kenya's economy, with huge plantations and smallholder farms. However, tea cultivation can have serious environmental effects, such as deforestation, soil erosion, and water pollution caused by pesticides and fertilizers. These industries can better address these concerns by implementing green strategies. Environmental organization performance, in this context, refers to how well an organization minimizes its negative impact on the natural environment. For tea industries, key indicators of environmental performance include green supplier selection, incorporation of renewable energy sources, green manufacturing, and green logistics. The implementation of green procurement strategies in Meru County's tea sector has the potential to dramatically enhance environmental performance. By incorporating sustainability into their procurement processes, these businesses can reduce their environmental effect, comply with regulations, and improve overall sustainability. This research intends to provide a complete understanding of how green procurement can drive environmental performance, as well as significant insights that can be extended to other agricultural sectors and areas.

Cankaya et al. (2019) defines green procurement practices as the practices involving sourcing of products and services that have a reduced impact on the environment throughout their lifecycle. This includes considerations related to the environmental impact during production, transportation, use, and disposal. Kenya is one of the world's leading tea producers with the tea industry contributing significantly to the country's economy and livelihood (Ketepa, 2020). The Kenya tea producers are under increasing pressures to adopt sustainable practices that promote environmental sustainability while maintaining economic viability as consumer demand rises worldwide for sustainability sourced products. As part of the Kenyan tea industry's green practices initiatives like green manufacturing has been incorporated to reduce environmental impact, conserve natural resources and increase social welfare. A key challenge facing Kenya's tea industry is balancing environmental conservation with economic profitability, the implementation of green practices can incur initial costs and require investments in infrastructure and technology, but it can also boost productivity, improve product quality and enhance market competitiveness over time.

Adopting green procurement practices is now widely recognized as crucial for improving the environmental performance of organizations in Meru County's tea sector, in Kenya. The tea farmers in this area heavily rely on this idea to ensure the sustainability and competitiveness of their business. Green practices cover a wide range of actions and outcomes. Environmental organizational performance is referred to as the systematic evaluation of an organization's environmental efforts and the results they achieve. In the tea sector, this involves implementing policies that minimize negative impacts on the environment, enhance resource efficiency, and promote sustainable operations. This includes measures like reducing energy consumption, managing waste

effectively, sourcing sustainably, and decreasing carbon emissions (Njenga & Mugendi, 2023).

Environmental organizational performance is defined as the extent to which an organization's operations and practices benefit the environment. It assesses an organization's environmental policies, compliance with environmental standards, and successful implementation of sustainable practices that reduce negative environmental impacts (Kariuki & Muturi, 2022). In essence, it assesses how successfully a business incorporates environmental factors into its strategic and operational decisions.

In Kenya, tea is grown mainly as a cash crop sold both locally and internationally. According to Der wal (2011), Kenya is at a third position in Global tea production and a second position in tea export that accounts for 20% of tea exported in the whole world. Much of the tea is grown in the Kenyan Highlands located on the West of the Rift Valley, with some grown-on highlands east of the Rift Valley as well as in eastern Kenya in Meru. About 60% is grown by small scale farmers with about 40% being grown by large-scale privately-owned estates. In Meru County, tea farming is concentrated in the highland's areas of Mount Kenya region and Nyambene hills. The tea factories in Meru County are Imenti tea factory situated at Kathera location (south Imenti Division) of Meru central district tea was first planted in the area in 1959, as planting intensified in the region it facilitated the construction of Imenti tea factory which was commissioned on 28th April 1971. Githongo factory co ltd situated in Meru central district of Eastern province 11km off the Embu-Meru highway west of Meru town ([Kenya Tea Development Agency], 2024). other factories include Kinoro, Kionyo, Kiegoi, Michimikuru, Igembe, Njeru and weru.

Problem Statement

In Africa, renewable energy sources are one of the notable green practices. In South Africa, Kenya and Morrocco have made significant progress in harnessing renewable energy particularly solar and wind power. As an example, the Noor solar powerplant in Morrocco is one of the world's largest concentrated solar power plants, contributing to the countries energy security and reducing greenhouse gas emissions (World Bank, 2022). In a similar way Kenya's lake Turkana wind power project has increased access to clean energy while reducing dependency on fossil fuels (International Finance Corporation, 2019). However, African economies also face unique challenges in implementing green practices such as limited access to resources, inadequate infrastructure and regulatory constraints (Nhamo et al., 2019).

A number of recent studies for instance Kiarie et al. (2023) and Mwangi and Gitau (2022) have stressed the importance of embracing green logistics to minimize carbon emissions, optimize transportation routes and reduce resource consumption with manufacturing supply chain. Additionally, Nyaga et al. (2024) stress the importance of selecting sustainable suppliers, which encompasses considerations of product sustainability, ethical sourcing and environmental impact reduction. Kenya's manufacturing however poses unique challenges and opportunities when it comes to adopting green logistics and green supplier selection practices. There are several factors that affect how effectively green practices can be implemented and incorporated into existing manufacturing processes, including infrastructure limitations, regulatory frameworks and socio-economic dynamics, the focal point of this study is to determine the effects of adopting green practices on organization environmental performance in the tea processing sector in Meru County.

Objectives of the Study

The General objective of the study is to investigate the effects of adopting green procurement practices on organization environmental performance in tea processing industries in Meru County. The study was guided by the follwing specific objectives :

- To investigate the effect of green Supplier selection on organization environmental performance in tea processing industries in Meru County

- To examine the effect of incorporation of renewable energy sources on organization environmental performance in tea processing industries in Meru County
- To determine the influence of green manufacturing on organization environmental performance in tea processing industries in Meru County
- To establish the effect of green logistics on organization environmental performance among tea processing industries in Meru County

LITERATURE REVIEW

Theoretical Literature Review

Resourced Based View

The RBV theory underscores that resources which are valuable, rare, difficult to imitate, and not easily substituted provide a competitive advantage (Melville et al., 2004). Cardeal and Antonio (2012) elaborate on the RBV by asserting that competitive advantage stems from resources meeting the VRIO criteria - Valuable, Rare, Inimitable, and Organizational. These encompass assets, capabilities, organizational processes, and information, categorized as tangible or intangible resources. The RBV underscores that the competitive edge can be influenced by environmental factors, necessitating businesses to leverage environmental advantages to stay ahead (Hart, 1995).

The RBV's emphasis on internal resources might downplay the significance of outside networks and partnerships in boosting competitiveness (Barney, 1991). Partnerships with government organizations, foreign purchasers, and research institutes are essential to tea industry's efforts to promote innovation, advance agricultural techniques, and open up new markets (Nyang'oro et al., 2020). Neglecting the mutually beneficial benefits of outside connections may make it more difficult for the sector to adjust to shifting consumer demands and technology improvements. When applied to green manufacturing, the RBV can help explain how companies can leverage their unique resources and capabilities to achieve environmental sustainability and competitive advantage. In the context of green manufacturing, valuable resources include technologies, processes, and practices that reduce environmental impact and improve resource efficiency. Firms that develop or acquire such resources can reduce costs related to waste management, energy consumption, and compliance with environmental regulations. These resources can provide a competitive advantage by enhancing efficiency and differentiating products in the marketplace. the Resource-Based View can be used to explain green manufacturing by highlighting how a firm's unique resources and capabilities in sustainability can create competitive advantages. Firms that successfully develop and manage these resources are likely to outperform competitors in terms of both environmental impact and financial performance. This theory holds significance for the selected tea industries aiming to implement green procurement practices.

Triple Bottom Line Theory

In 1994, researcher John Elkington introduced the concept of the triple bottom line theory, which suggests that businesses should evaluate their impacts across three distinct dimensions. Elkington posited that beyond pursuing profit alone, businesses should evaluate and disclose their activities concerning Planet, People, and Profit (Hindle, 2008). Supporters contend that adopting this strategy can result in long-term success and sustainable development when it comes to the tea sector. First and foremost, implementing the Triple Bottom Line concept encourages tea growers to make investments in the welfare of their workforce and surrounding communities. Tea companies can help reduce poverty and promote social equality by offering fair wages, good working conditions, and support for community development initiatives (Shetty & Bhanot, 2016). Additionally, building strong links with local communities can improve the industry's standing and reduce the likelihood of labor disputes or social upheaval.

The Triple Bottom Line theory provides a comprehensive approach to corporate management that takes into account social, environmental, and financial factors. However, there are opportunities and obstacles associated with its use in the tea industry. Tea businesses can lessen their environmental impact while improving the lives of their employees and communities by using sustainable practices and making social development investments. To achieve this balance, though, calls for removing the industry's structural impediments to sustainability as well as its financial limitations. This study embraced the triple bottom line theory as the anchoring theory as it mandates businesses to consider their economic, social, and ecological impacts.

Institutional Theory

Institutional theory, as outlined by Scott (1994) suggests that companies are influenced by external forces in determining their strategies. These strategies are aimed at improving their acceptance among customers and other stakeholders. One of the key concepts within institutional theory is isomorphic pressures, which were identified by DiMaggio and Powell (1983). These pressures manifest in three forms: coercive, normative, and mimetic.

According to the institutional theory, the institutional frameworks that control various businesses including Kenya's tea industry have a significant impact on how long those industries may remain viable. In the context of Meru's tea business, one of the main justifications supporting this hypothesis is that when sustainable practices are integrated into the industry's institutional framework, they have a higher chance of being adopted and upheld. Scott (2001) asserts that institutions have a significant impact on how norms and organizational behavior are shaped, which in turn affects the adoption of sustainable practices. Establishing norms and rules for sustainable tea production, organizations like the Kenya Tea Development Agency (KTDA) and the Tea Board of Kenya act as regulatory agencies in Kenya.

The institutional theory offers important insights into how institutional frameworks support sustainability in Meru's tea industry, but its applicability depends on how well governance issues are resolved, how well economic incentives are aligned, and how sociocultural contexts are taken into consideration. By including these factors, institutional actions can have a greater impact and promote more sustainably produced tea in the country.

Empirical Literature Review

Effects of Green Practices on performance

Wang et al. (2020) examined the effect of green practices on organizational performance using information from the Chinese manufacturing industry. They collected data from manufacturing companies using a quantitative method in order to examine the connection between organizational success and green practices. They found that companies who adopted green practices witnessed gains in a number of organizational performance characteristics, such as higher innovation output, more efficient operations, and better financial results. Their study also emphasized the advantages of green practices for manufacturing organizations' overall competitiveness and sustainability. Lastly, their results imply that incorporating green practices into manufacturing processes can result in quantifiable advantages.

Oduro-Frimpong and Wiafe's (2021) study, published in the African Journal of Business Management, sought to investigate the role of stakeholder participation in the implementation of green practices and its implications on organizational performance. They surveyed and interviewed managers and employees from various Ghanaian companies. Their findings indicate that successful stakeholder involvement promotes the adoption of green practices, which in turn improves organizational performance. This link emphasizes the significance of incorporating stakeholders in sustainability programs to drive organizational change and enhance performance indicators.

In their study, Mwangi and Muthoni (2020) investigated the connection between Kenyan manufacturing companies' financial performance and green supply chain management strategies. They gathered information by distributing structured questionnaires to a subset of industrial firms, and they examined variables like environmental certifications, eco-design, reverse logistics, and green buying.

The results showed a strong positive link between financial performance metrics and the use of green supply chain management techniques. In comparison to their peers that did not prioritize sustainability, companies that incorporated environmental considerations into their supply chain activities reported higher profitability, increased market share, and enhanced return on investment. The study highlighted how adopting green practices might provide Kenya's manufacturing industry with both financial and competitive advantages.

Conceptual Framework

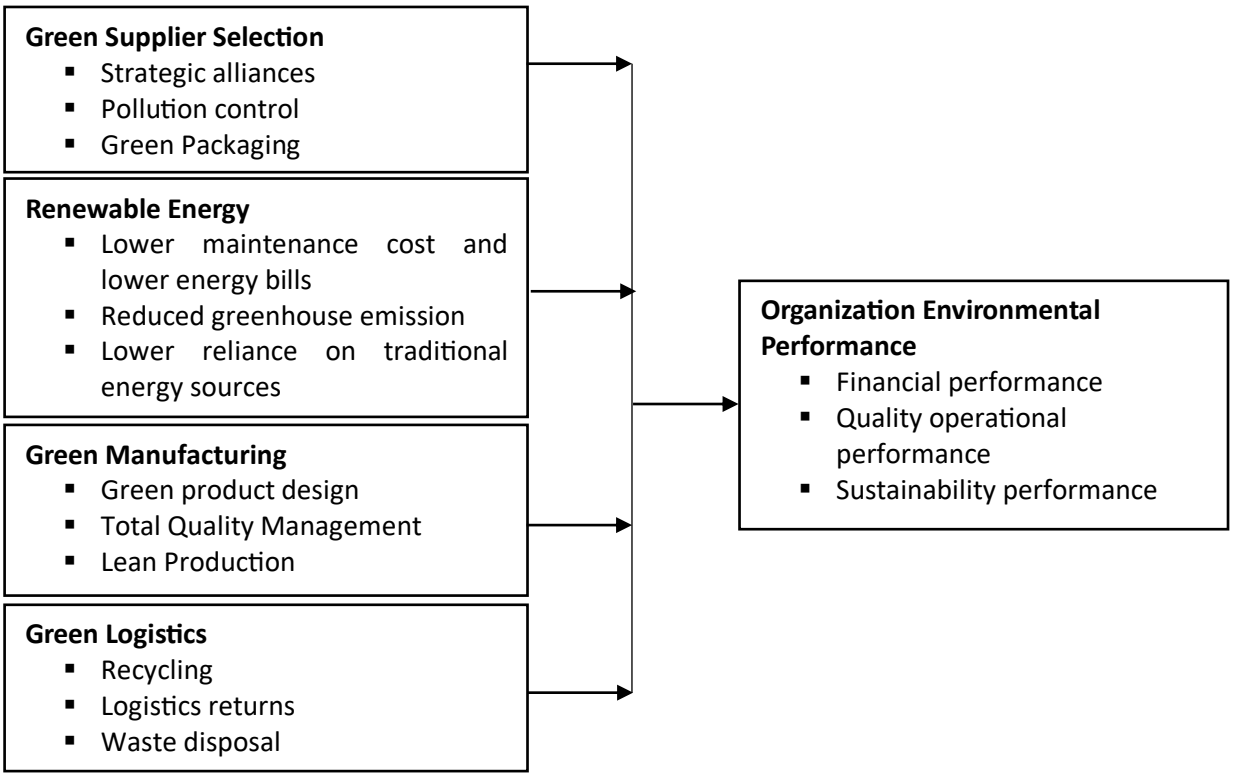

Figure 1: Conceptual Framework

METHODOLOGY

Descriptive survey design was used for this study since it enables sampling as well as the collection and analysis of both qualitative and quantitative data.

The 9 industries in Meru County comprise the target population for this study, which was made up of 9 managers, 65 departmental heads and 247 departmental staff. All managers and departmental heads and staff were chosen for the study using the census approach.

This study only used primary data that was self-administered by the researcher using a standardized questionnaire designed for that

purpose. The researcher conducted a pilot study in Chagaik and Kimari tea industries in Kericho County whose 2 managers and 32 departmental heads and staff took part in the piloting. Before the primary research, a pretest of the questionnaire was carried out to make sure it is judged acceptable and reliable for use in the study.

The Cronbach Alpha Coefficient was used to determine the reliability of the questionnaires, with a threshold score of 0.7 being set for each instance of failure beyond which the instruments needed to be further refined. Descriptive analysis was done using SPSS software to examine the information gathered from closed-ended and Likert-type questions.

The study employed inferential statistics to evaluate the degree of correlation and strength between the independent variables and the dependent variable. The multiple regression analysis made use of the following model.

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

Where,

Y = Organizational Performance of tea firms

X_1= Green Supplier Selection

X_2 = Incorporation of Renewable energy sources

X_3 = Green Manufacturing

X_4 =Green Logistics

ε = Error term

FINDINGS AND DISCUSSION

Response Rate

Out of a sample of 341 individuals, 321 did respond to the questionnaires and gave their responses, giving this study a response rate of 94%.

Green Practices

The respondents indicated the extent to which they agreed with the statements on green practices using the following 5-point Likert scale:

1 - Strongly disagree 2 – Disagree 3 – Indifferent 4 – Agree 5 - Strongly agree

Table 1: Green supplier selection

Statements	Rating					Mean
	1	2	3	4	5	
My organization is generally environmentally conscious in its supplier selection operations	55	41	85	78	62	3.1589
My organization has collaborations with its suppliers aimed at developing cleaner technology and processes for its inputs	66	52	44	75	84	3.1838
My organization purchases only from suppliers who follow environmental regulations and meet environmental quality standards.	85	91	32	49	64	2.7383
My organization has pollution control measures	21	42	75	87	96	3.6075
My organization practices green packaging to their products	36	62	97	48	78	3.2181
My organization only purchase from a few suppliers with whom there are strong relationship to avoid wastes associated with market seasonality.	25	37	56	98	105	3.6885

The participants rated the statements on green supplier selection in the above table, and mean ratings (out of the possible 5.0) were attained as follows: “My organization is generally environmentally conscious in its supplier selection operations” had a mean rating of 3.1589; “My organization has collaborations with its suppliers aimed at developing cleaner technology and processes for its inputs” had a mean rating of 3.1838; “My organization purchases only from suppliers who follow environmental regulations and meet environmental quality standards” had a mean rating of 2.7383; “My organization has pollution control measures” had a mean rating of 3.6075; “My organization practices green packaging to their

products" had a mean rating of 3.2181, while; "My organization only purchase from a few suppliers with whom there are strong relationship to avoid wastes associated with market seasonality" had a mean rating of 3.6885.

The relatively low mean ratings for the statements "My organization purchases only from suppliers who follow environmental regulations and meet environmental quality standards" (2.7383) and "My organization has collaborations with its suppliers aimed at developing cleaner technology and processes for its inputs" (3.1838) suggest that the firms are not stringent enough in their supplier selection process and do not actively engage with suppliers to enhance environmental sustainability.

However, the firms could be more conscious of environmental considerations in their overall supplier selection operations, as evidenced by the slightly higher mean rating of 3.1589 for the statement "My organization is generally environmentally conscious in its supplier selection operations." Additionally, the firms seem to have pollution control measures (mean rating of 3.6075) and practice green packaging (mean rating of 3.2181), indicating a broader commitment to environmental performance.

These findings align with past research that highlights the importance of green supplier selection in enhancing overall environmental performance (Diabat & Govindan, 2018; Govindan et al., 2015). The findings suggests that the tea processing firms in Meru County can further strengthen their green supplier selection practices to realize greater environmental benefits, which can ultimately contribute to their overall sustainability.

Table 2: Incorporation of renewable energy sources

Statements	Rating					Mean
	1	2	3	4	5	
Incorporation of renewable energy sources						
Energy sources used in manufacturing in the organization are environmentally friendly	15	21	61	103	121	3.9159
Manufacturing technology used in manufacturing in the organization for lower maintenance cost and lower energy bills	27	49	67	83	95	3.5296
The production technology used in manufacturing in the organization has minimal environmental pollution to reduce greenhouse emissions	8	25	43	121	124	4.0318
The factory practices lower reliance on traditional energy sources	44	69	49	62	97	3.3084

The participants rated the statements on the incorporation of renewable energy sources in the above table, and the attained mean ratings (out of the possible 5.0) were recorded as follows: "Energy sources used in manufacturing in the organization are environmentally friendly" had a mean rating of 3.9159; "Manufacturing technology used in manufacturing in the organization for lower maintenance cost and lower energy bills" had a mean rating of 3.5296; "The production technology used in manufacturing in the organization has minimal environmental pollution to reduce greenhouse emissions" had a mean rating of 4.0318, while "The factory practices lower reliance on traditional energy sources" had a mean rating of 3.3084.

The relatively high mean ratings for the statements "The production technology used in manufacturing in the organization has minimal environmental pollution to reduce greenhouse emissions" (4.0318)

and "Energy sources used in manufacturing in the organization are environmentally friendly" (3.9159) suggest that the firms are conscious of their environmental impact and are making concerted efforts to reduce their carbon footprint through the use of cleaner production technologies and renewable energy sources.

These findings align with past research that highlights the importance of renewable energy integration and the adoption of eco-friendly production processes in enhancing environmental performance (Rauer & Kaufmann, 2015; Zailani et al., 2012). The firms' efforts to utilize manufacturing technologies that are cost-effective and energy-efficient, as evident from the mean rating of 3.5296 for the statement "Manufacturing technology used in manufacturing in the organization for lower maintenance cost and lower energy bills," further underscores their commitment to environmental and economic sustainability.

However, the relatively lower mean rating of 3.3084 for the statement "The factory practices lower reliance on traditional energy sources" suggests that the firms may still be dependent on conventional energy sources to some extent, which could limit their overall environmental performance. This finding presents an opportunity for the firms to further explore and invest in renewable energy alternatives, such as solar, wind, or hydropower, to reduce their carbon footprint and enhance their environmental sustainability.

The implications of these findings are that the tea processing firms in Meru County are on the right track in terms of incorporating renewable energy sources and adopting environmentally-friendly production technologies, but there is still room for improvement, particularly in reducing the reliance on traditional energy sources. By further strengthening their efforts in this direction, the firms can not only enhance their environmental performance but also gain a competitive advantage in the industry.

Table 3: Green manufacturing

Statements	Rating					Mean
	1	2	3	4	5	
Green manufacturing						
Manufacturing technology used in manufacturing in the organization reduce material wastages and increase productivity	13	35	56	89	128	3.8847
The production technology used in manufacturing in the organization has minimal environmental pollution	25	41	65	77	113	3.6604
Materials used and produced in the organization are associated with little wastes and pollution	31	43	59	87	101	3.5732
Products offered by the organization are designed such that they can be used over a long time, reused or recycled.	1	13	85	98	123	4.0156
Production processes follow total quality management	6	29	81	95	110	3.8536
Lean production measures are incorporated in the manufacturing processes	30	37	61	85	108	3.6355

The participants rated the statements on green manufacturing in the above table, and the attained mean ratings (out of the possible 5.0) were recorded as follows: “Manufacturing technology used in manufacturing in the organization reduce material wastages and increase productivity” had a mean rating of 3.8847; “The production technology used in manufacturing in the organization has minimal environmental pollution” had a mean rating of 3.6604; “Materials used and produced in the organization are associated with little wastes and pollution” had a mean rating of 3.5732; “Products offered by the organization are designed such that they can be used over a long time, reused

or recycled" had a mean rating of 4.0156; "Production processes follow total quality management" had a mean rating of 3.8536, while; "Lean production measures are incorporated in the manufacturing processes" had a mean rating of 3.6355.

The high mean rating of 4.0156 for the statement "Products offered by the organization are designed such that they can be used over a long time, reused or recycled" indicates that the firms are focused on developing products with a long lifespan and recyclability. This aligns with the principles of circular economy and product stewardship, which have been widely advocated in the literature as key strategies for sustainable manufacturing (Govindan et al., 2015; Luthra et al., 2016).

Additionally, the firms appear to be utilizing manufacturing technologies that reduce material wastage and increase productivity, as evidenced by the mean rating of 3.8847 for the statement "Manufacturing technology used in manufacturing in the organization reduce material wastages and increase productivity." This suggests a commitment to lean and efficient production processes, which can contribute to both environmental and economic sustainability.

The firms also seem to have implemented measures to minimize environmental pollution through their production processes, with a mean rating of 3.6604 for the statement "The production technology used in manufacturing in the organization has minimal environmental pollution." This is in line with the growing emphasis on cleaner production and the use of environmentally-friendly technologies in the manufacturing sector (Rauer & Kaufmann, 2015; Zailani et al., 2012).

Furthermore, the relatively high mean ratings for "Production processes follow total quality management" (3.8536) and "Lean production measures are incorporated in the manufacturing processes" (3.6355) suggest that the firms are adopting holistic approaches to improve their operational efficiency and environmental performance.

The implications of these findings are that the tea processing firms in Meru County are well-positioned to enhance their environmental sustainability through the adoption of green manufacturing practices. However, there is still room for improvement, particularly in the areas of material selection and waste management, as indicated by the relatively lower mean rating of 3.5732 for the statement "Materials used and produced in the organization are associated with little wastes and pollution." By further strengthening their efforts in these areas, the firms can achieve greater environmental and economic benefits, ultimately contributing to their long-term competitiveness and overall sustainability.

Table 4: Green logistics

Statements	Rating					Mean
	1	2	3	4	5	
Green logistics						
The organization has effective product recycling	12	36	68	87	118	3.8193
The organization has put in place logistics return initiatives that helps in environmental conservation	55	41	75	65	85	3.2617
There are measures put into place for effective waste disposal in the organization.	12	31	71	95	112	3.8224
There are systems put into place measures to recover materials or wastes that may be harmful to the environment.	32	36	93	71	89	3.4642

The participants rated the statements on green logistics in the above table, and the attained mean ratings (out of the possible 5.0) were recorded as follows: "The organization has effective product recycling" had a mean rating of 3.8193; "The organization has put in place logistics return

initiatives that helps in environmental conservation" had a mean rating of 3.2617; "There are measures put into place for effective waste disposal in the organization" had a mean rating of 3.8224, while; "There are systems put into place measures to recover materials or wastes that may be harmful to the environment" had a mean rating of 3.4642.

The high mean rating of 3.8193 for "The organization has effective product recycling" suggests that the tea processing firms are actively engaged in recycling their products, which is a positive step towards reducing waste and improving environmental performance. This aligns with the existing literature, which emphasizes the importance of product recycling in green logistics (Björklund & Forslund, 2018).

However, the relatively lower mean ratings for "The organization has put in place logistics return initiatives that helps in environmental conservation" (3.2617) and "There are systems put into place measures to recover materials or wastes that may be harmful to the environment" (3.4642) indicate that the implementation of reverse logistics and material recovery initiatives is not as advanced. This finding is consistent with the challenges reported in the literature regarding the adoption of green logistics practices, particularly in developing countries (Diabat & Govindan, 2017).

The high mean rating of 3.8224 for "There are measures put into place for effective waste disposal in the organization" suggests that the tea processing firms are taking steps to ensure proper waste disposal, which is a crucial aspect of green logistics (Sarkis, 2018). This is a positive finding, as effective waste management can contribute to improved environmental performance.

The implications of these findings are that the tea processing firms in Meru County have recognized the importance of green logistics, but they may need to strengthen their efforts in implementing more comprehensive reverse logistics and material recovery initiatives. Investing in these areas could further enhance their environmental performance and contribute to their overall sustainability.

Organization Environmental Performance

The respondents indicated the extent to which they agreed with the statements on organization environmental performance using the following 5-point Likert scale:

1 - Strongly disagree 2 – Disagree 3 – Indifferent 4 – Agree 5 - Strongly agree.

Table 5: Financial Performance

No.	Statements	Rating					Mean
		1	2	3	4	5	
Financial Performance							
	The organization incurs minimum costs in complying with environmental standards and regulations.	46	35	66	96	78	3.3894
	Cost incurred in sourcing for and delivery of company inputs is at minimum possible level	10	21	67	108	115	3.9252
	Cost incurred in making the products available to consumers is at the minimum possible level	35	42	68	95	81	3.4517
	Cost of energy is at minimum possible level	6	19	88	96	112	3.9003
	Production system used in the organization is flexible and adapts to fluctuations in market demand at minimum cost.	4	21	69	87	103	3.4766
	Cost associated with treatment and disposal of wastes is at minimum.	9	18	74	94	126	3.9657
	Customers are satisfied with the quality and safety of the company products.	0	2	87	96	136	4.1402

The participants rated the statements on financial performance in the above table, and the attained mean ratings (out of the possible 5.0) were recorded as follows: "The organization incurs

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minimum costs in complying with environmental standards and regulations" had a mean rating of 3.3894; "Cost incurred in sourcing for and delivery of company inputs is at minimum possible level" had a mean rating of 3.9252; "Cost incurred in making the products available to consumers is at the minimum possible level" had a mean rating of 3.4517; "Cost of energy is at minimum possible level" had a mean rating of 3.9003; "Production system used in the organization is flexible and adapts to fluctuations in market demand at minimum cost" had a mean rating of 3.4766; "Cost associated with treatment and disposal of wastes is at minimum" had a mean rating of 3.9657, while; "Customers are satisfied with the quality and safety of the company products" had a mean rating of 4.1402.

The high mean rating of 3.9657 for "Cost associated with treatment and disposal of wastes is at minimum" indicates that the firms have been able to effectively manage their waste disposal costs, which is in line with the principles of green logistics and environmental stewardship (Srivastava, 2007). This finding aligns with the literature, which suggests that proper waste management can lead to cost savings for organizations (Chaabane et al., 2012).

Similarly, the high mean ratings for "Cost incurred in sourcing for and delivery of company inputs is at minimum possible level" (3.9252) and "Cost of energy is at minimum possible level" (3.9003) suggest that the firms have been able to optimize their procurement and energy management, which can contribute to improved financial performance.

However, the relatively lower mean ratings for "The organization incurs minimum costs in complying with environmental standards and regulations" (3.3894) and "Production system used in the organization is flexible and adapts to fluctuations in market demand at minimum cost" (3.4766) indicate that the firms may still be facing challenges in managing the costs associated with environmental compliance and adapting their production systems to market demands.

The high mean rating of 4.1402 for "Customers are satisfied with the quality and safety of the company products" is a positive finding, as it suggests that the firms have been able to maintain high-quality and safe products, which can contribute to customer satisfaction and loyalty, ultimately leading to improved financial performance (Zhu et al., 2008).

The implications of these findings are that the tea processing firms in Meru County have made significant strides in improving their financial performance through the adoption of green practices, particularly in the areas of waste management, procurement, and energy management. However, they may need to address the challenges associated with environmental compliance and production flexibility to further enhance their financial performance.

Table 6: Quality operational performance

Statements	Rating					Mean
	1	2	3	4	5	
Quality operational performance						
Have Green practices improved the overall quality of products/services.	25	12	69	95	120	3.8505
To what extent have green initiatives positively impacted the reliability.	12	36	59	87	127	3.8754
There is a reduction in product defects since implementing green practices.	43	19	76	65	118	3.6106
Green initiatives have streamlined our quality control processes.	19	36	74	71	121	3.7445
There has been an increased operational efficiency through the adoption of green technologies.	25	21	89	82	104	3.6822
Green initiatives have reduced organization's carbon footprint significantly.	45	58	63	56	99	3.3302
The supply chain has become more resilient with green practices.	15	43	74	81	108	3.6978
Green practices have resulted in cost savings for the organization.	10	23	75	96	117	3.8941

The participants rated the statements on quality operational performance in the above table, and the attained mean ratings (out of the possible 5.0) were recorded as follows: “Green practices have improved the overall quality of the products/services” had a mean rating of 3.8505; “the extent to which green initiatives have positively impacted the product/service reliability” had a mean rating of 3.8754; “There has been a reduction in product defects since the implementation of green practices” had a mean rating of 3.6106; “Green initiatives have streamlined our quality control processes” had a mean rating of 3.7445; “There has been an increased operational efficiency through the adoption of green technologies” had a mean rating of 3.6822; “Green initiatives have reduced our organization's carbon footprint significantly” had a mean rating of 3.3302; “The supply chain has become more resilient and sustainable with green practices” had a mean rating of 3.6978, while; “Green practices have resulted in cost savings for the organization” had a mean rating of 3.8941.

The relatively high mean ratings for "Green practices have improved the overall quality of the products/services" (3.8505), "the extent to which green initiatives have positively impacted the product/service reliability" (3.8754), and "Green practices have resulted in cost savings for the organization" (3.8941) indicate that the firms have been able to enhance their product quality, reliability, and cost-effectiveness through the implementation of green initiatives. This is consistent with the existing literature, which suggests that green supply chain management practices can lead to improved product quality and operational efficiency (Zhu & Sarkis, 2004; Liang et al., 2021).

However, the relatively lower mean rating for "Green initiatives have reduced our organization's carbon footprint significantly" (3.3302) suggests that the firms may still be facing challenges in significantly reducing their environmental impact, despite the adoption of green practices. This finding aligns with the literature, which highlights the complexity of achieving substantial carbon footprint reductions in supply chain operations (Toke et al., 2012).

The mean ratings for "There has been a reduction in product defects since the implementation of green practices" (3.6106), "Green initiatives have streamlined our quality control processes" (3.7445), "There has been an increased operational efficiency through the adoption of green technologies" (3.6822), and "The supply chain has become more resilient and sustainable with green practices" (3.6978) indicate that the firms have experienced moderate improvements in these areas. These findings suggest that the firms are still in the process of fully realizing the operational benefits of their green initiatives, which is consistent with the challenges reported in the literature regarding the implementation of green supply chain practices (Diabat & Govindan, 2011).

The implications of these findings are that the tea processing firms in Meru County have made progress in improving their quality operational performance through the adoption of green practices, but they may need to further strengthen their efforts to achieve more significant reductions in their environmental impact and fully realize the operational benefits of their green initiatives.

Table 7: Sustainability Performance

Statements	Rating					Mean
	1	2	3	4	5	
Sustainability Performance						
Operations of your organization have minimum hazardous effects on employees, the community and the environment.	0	5	51	109	156	4.2960
There are minimum degrading effects on the environment caused by sources of energy used by the organization	19	41	65	74	122	3.7445
There is minimum level of solid and liquid wastes discharged into the environment by your organization	45	43	52	85	96	3.4486
There is minimal number of environmental problems associated with the company's operations and products	11	7	75	106	122	4.0000

The participants rated the statements on sustainability performance in the above table, and the attained mean ratings (out of the possible 5.0) were recorded as follows: "Operations of your organization have minimum hazardous effects on employees, the community and the environment" had a mean rating of 4.2960; "There are minimum degrading effects on the environment caused by sources of energy used by the organization" had a mean rating of 3.7445; "There is minimum level of solid and liquid wastes discharged into the environment by your organization" had a mean rating of 3.4486, while; "There is minimal number of environmental problems associated with the company's operations and products" had a mean rating of 4.0000.

The high mean rating of 4.2960 for "Operations of your organization have minimum hazardous effects on employees, the community and the environment" indicates that the firms have been able to effectively manage the environmental and social impacts of their operations, which is in line with the principles of corporate sustainability (Dyllick & Hockerts, 2002). This finding aligns with the literature, which suggests that the adoption of green practices can lead to reduced environmental and social impacts (Longoni & Cagliano, 2015).

Similarly, the high mean rating of 4.0000 for "There is minimal number of environmental problems associated with the company's operations and products" suggests that the firms have been able to minimize the environmental problems associated with their activities, which can contribute to improved sustainability performance.

However, the relatively lower mean ratings for "There are minimum degrading effects on the environment caused by sources of energy used by the organization" (3.7445) and "There is minimum level of solid and liquid wastes discharged into the environment by your organization" (3.4486) indicate that the firms may still be facing challenges in managing the environmental impacts of their energy use and waste disposal practices.

The implications of these findings are that the tea processing firms in Meru County have made significant strides in improving their sustainability performance, particularly in terms of reducing the hazardous effects of their operations on employees, the community, and the environment. However, they may need to address the challenges associated with energy use and waste management to further enhance their sustainability performance.

These findings are consistent with the existing literature, which suggests that the implementation of green supply chain management practices can lead to improved environmental and social performance (Golicic & Smith, 2013; Zhu et al., 2008). The relatively lower mean ratings for energy use and waste management suggest that the firms may need to focus more on these areas to achieve a higher level of sustainability.

Reasons for Adopting Green Practices

Table 8: Reasons for Adopting Green Practices

No.	Statements	Rating					Mean
		1	2	3	4	5	
Reasons for Adopting Green Practices							
	Government Incentives	26	40	71	81	103	3.6075
	Demands from Consumers and Other Stakeholders	15	29	69	96	112	3.8131
	Competition from other Service Providers	14	11	83	89	124	3.9283
	Reduced Costs and Better Returns	6	15	91	100	109	3.9065
	Increased Market Share	0	5	86	112	118	4.0685
	Personal Satisfaction for Conserving Environment	14	29	93	84	101	3.7134
	Scarcity of Resources	33	36	73	83	96	3.5389
	Corporate Social Responsibility	38	55	61	76	91	3.3956
	Extended Producer Responsibility	10	19	74	99	119	3.9283
	Government Regulations Requirement	3	22	87	75	134	3.9813

The participants rated the statements on sustainability performance in the above table, and the attained mean ratings (out of the possible 5.0) were recorded as follows: “government incentives” had a mean rating of 3.6075; “Demands from consumers and other stakeholders” had a mean rating of 3.8131; “Competition from other service providers” had a mean rating of 3.9283; “Reduced costs and better returns” had a mean rating of 3.9065; “Increased market share” had a mean rating of 4.0685; “Personal satisfaction for conserving environment” had a mean rating of 3.7134; “Scarcity of resources” had a mean rating of 3.5389; “Corporate social responsibility” had a mean rating of 3.3956; “Extended producer responsibility” had a mean rating of 3.9283, while; “Government regulations requirement” had a mean rating of 3.9813.

The relatively high mean ratings for "Competition from other service providers" (3.9283), "Reduced costs and better returns" (3.9065), "Increased market share" (4.0685), "Extended producer responsibility" (3.9283), and "Government regulations requirement" (3.9813) indicate that these factors are strong drivers for the implementation of sustainable practices among the firms.

These findings align with the existing literature, which suggests that competitive pressure, financial benefits, and regulatory requirements are key motivators for firms to adopt sustainable supply chain management practices (Zhu et al., 2008; Diabat & Govindan, 2011; Luthra et al., 2016). For instance, Zhu et al. (2008) found that regulatory pressure and competitive advantage were significant drivers for green supply chain management implementation in Chinese manufacturing firms.

The moderately high mean rating for "Demands from consumers and other stakeholders" (3.8131) suggests that stakeholder pressure is also an important factor influencing the firms' sustainability efforts. This is consistent with the literature, which highlights the role of stakeholder pressure in driving corporate sustainability initiatives (Sarkis et al., 2010; Tate et al., 2010).

However, the relatively lower mean ratings for "government incentives" (3.6075), "Personal satisfaction for conserving environment" (3.7134), and "Corporate social responsibility" (3.3956) indicate that these factors may be less influential in motivating the firms to adopt sustainable practices. This finding contrasts with some of the existing research, which has emphasized the importance of personal and social motivations, as well as

government support, in promoting sustainability initiatives (Golicic & Smith, 2013; Seuring & Müller, 2008).

The implications of these findings are that the tea processing firms in Meru County are primarily driven by competitive, financial, and regulatory factors in their adoption of sustainable practices, while the influence of personal, social, and government-related factors may be less pronounced. This suggests that the firms may need to further strengthen their environmental and social motivations, as well as seek more government support, to enhance their sustainability performance.

Challenges in Implementing Green Practices

Table 1: Challenges in Implementing Green Practices

Statements	Rating					Mean
	1	2	3	4	5	
Challenges in Implementing Green Practices						
Lack of appropriate technology	15	35	85	85	101	3.6916
Resistance from suppliers	5	23	75	90	128	3.9751
Lack of enough finances to support the implementation	40	58	60	71	92	3.3645
Lack of top management support	45	62	53	68	93	3.3178
Lack of internal competence and training on green practices	2	19	70	93	137	4.0716
Lack of clear benefits from implementing Green Practices	1	1	35	135	149	4.3396
Lack of metrics (KPI) to measure and monitor performance	13	25	58	74	151	4.0125
Lack of government incentives in implementing green practices	55	65	22	96	83	3.2710
Unavailability of green materials in the market	71	51	38	75	86	3.1682
High cost of green products	22	10	88	93	108	3.7944

The participants rated the statements on sustainability performance in the above table, and the attained mean ratings (out of the possible 5.0) were recorded as follows: “Lack of appropriate technology” had a mean rating of 3.6916; “Resistance from suppliers” had a mean rating of 3.9751; “Lack of enough finances to support the implementation” had a mean rating of 3.3645; “Lack of top management support” had a mean rating of 3.3178; “Lack of internal competence and training on green practices” had a mean rating of 4.0716; “Lack of clear benefits from implementing Green Practices” had a mean rating of 4.3396; “Lack of metrics (KPI) to measure and monitor performance” had a mean rating of 4.0125; “Lack of government incentives in implementing green practices” had a mean rating of 3.2710; “Unavailability of green materials in the market” had a mean rating of 3.1682, while; “High cost of green products” had a mean rating of 3.7944.

The relatively high mean ratings for "Lack of internal competence and training on green practices" (4.0716), "Lack of clear benefits from implementing Green Practices" (4.3396), and "Lack of metrics (KPI) to measure and monitor performance" (4.0125) indicate that these are the most pressing challenges faced by the firms. These findings align with the existing literature, which highlights the importance of organizational capabilities, perceived benefits, and performance measurement systems in the adoption of sustainable supply chain management practices (Diabat & Govindan, 2011; Govindan et al., 2014; Luthra et al., 2016).

For instance, Diabat and Govindan (2011) found that the lack of training and know-how was a significant barrier to green supply chain management implementation in the Indian automotive industry. Similarly, Govindan et al. (2014) identified the lack of clear benefits and performance measurement systems as critical

obstacles to the adoption of sustainable practices in the Iranian manufacturing sector.

The moderately high mean ratings for "Resistance from suppliers" (3.9751) and "High cost of green products" (3.7944) suggest that supply chain-related and financial challenges also play a significant role in hindering the firms' sustainability efforts. These findings are consistent with the existing literature, which has emphasized the importance of supplier engagement and financial resources in the implementation of sustainable supply chain management practices (Sarkis et al., 2010; Walker et al., 2008).

However, the relatively lower mean ratings for "Lack of appropriate technology" (3.6916), "Lack of enough finances to support the implementation" (3.3645), "Lack of top management support" (3.3178), and "Lack of government incentives in implementing green practices" (3.2710) indicate that these factors may be less influential in deterring the firms from adopting sustainable practices. This finding contrasts with some of the existing research, which has highlighted the importance of technological capability, financial resources, top management support, and government incentives in promoting sustainability initiatives (Golicic & Smith, 2013; Seuring & Müller, 2008).

The implications of these findings are that the tea processing firms in Meru County are primarily challenged by organizational, performance measurement, and supply chain-related barriers in their adoption of sustainable practices, while the influence of technological, financial, managerial, and government-related barriers may be less pronounced. This suggests that the firms may need to focus on developing their internal capabilities, establishing clear performance measurement systems, and strengthening their supplier relationships to overcome the most significant challenges to sustainability implementation.

CONCLUSION

The study has shown that green procurement practices such as green supplier selection, green manufacturing, green logistics, and the incorporation of renewable energy sources are not only beneficial for the environment but also for the operational and financial performance of organizations.

Green supplier selection is seen as a pivotal factor in improving environmental performance. By prioritizing suppliers who adhere to environmentally friendly practices, tea processing industries in Meru County have been able to significantly reduce their carbon footprint, minimize waste, and enhance resource efficiency. This practice also promotes the overall sustainability of the supply chain, ensuring that environmental considerations are integrated at every stage of production.

The incorporation of renewable energy sources, such as solar and wind energy, has proven to be another vital strategy. This shift not only reduces dependency on non-renewable energy sources but also lowers greenhouse gas emissions and energy costs. The study found that industries that invested in renewable energy experienced a marked improvement in their environmental performance, which in turn, bolstered their market competitiveness.

Green manufacturing practices, which focus on reducing waste and optimizing resource use, were also found to contribute significantly to environmental performance. These practices enable industries to operate more efficiently, reduce production costs, and improve product quality, all of which are essential for maintaining a competitive edge in the global market. Furthermore, green manufacturing aligns with global trends towards sustainability, making it a critical component for any industry looking to remain relevant in the future.

Green logistics, which involves the efficient management of resources throughout the supply chain, was another key area highlighted by the

study. Proper waste management, recycling, and the implementation of reverse logistics were identified as effective strategies for reducing the environmental impact of tea processing operations. The adoption of these practices not only improves the sustainability of the industries but also enhances their reputation as environmentally responsible entities.

RECOMMENDATIONS

Tea industry managers in Meru County should take a proactive approach to incorporating green procurement practices into their operations. This includes prioritizing green supplier selection, investing in renewable energy sources, and adopting green manufacturing and logistics practices. Managers should work towards establishing partnerships with suppliers who are committed to sustainability and environmental stewardship. By investing in renewable energy, such as solar and wind, tea factories will significantly reduce their carbon footprint and operational costs. Managers should also foster a culture of sustainability within their organizations by training staff on green practices and encouraging innovation in environmentally friendly processes.

Local, sub-county, and county administrators play a crucial role in enforcing environmental regulations and promoting green practices within industries. These administrators, including chiefs, sub-county and county commissioners, should enforce existing environmental regulations strictly and work towards developing new guidelines that encourage the adoption of green procurement practices in the tea industry. It is also essential for these administrative bodies to facilitate the provision of incentives, such as tax breaks or subsidies, for industries that adopt sustainable practices. By organizing workshops and training sessions, administrators can raise awareness and educate industry stakeholders on the benefits of going green, thereby promoting a collective effort towards environmental conservation.

Policymakers, particularly within Kenya's Ministry of Energy, should focus on enacting laws and policies that encourage the adoption of renewable energy and reduce pollution. This includes developing national frameworks that support the use of renewable energy in industries and offering incentives to companies that invest in green technologies. Policymakers should also consider revising energy policies to make it easier for industries to access clean energy at a lower cost.

Recommendations for Future Study

Future research should focus on the long-term impacts of green procurement practices on both environmental and financial performance within the tea industry. Studies could explore the specific challenges faced by smaller tea processing firms in adopting green practices and how these challenges can be mitigated. Additionally, there is a need for research on the social impacts of green procurement, particularly how these practices affect local communities and workers in the tea industry. Finally, comparative studies between different regions in Kenya or between Kenya and other tea-producing countries could provide valuable insights into best practices and innovative solutions for sustainable tea production.

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