
**Sustainable Procurement Adoption and the Performance of Horticulture
Exporting Firms in Kenya**

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Abstract

In Kenya, horticulture is the second-biggest foreign exchange earner after the tea sector, contributing immensely to economic development. Despite its economic importance, the sector continues to encounter challenges as farmers' produce continues to be rejected in the global market and attributed to non-compliance sustainability issues along the supply chain. Hindering its total contribution to the economy. Consumers in the European market demand strict compliance with sustainability in the Supply Chain. Therefore, the study investigated the relationship between adopting a sustainable supply chain and firm performance. The study was grounded on the Diffusion of innovations theory, guided by a positivist research philosophy utilizing a cross-sectional descriptive research design. The study population was 645 members of the Registered Horticulture Exporters registered with the organization as of 2020. A stratified random sample was used to pick the sample unit, with a sample population of 242 units, as guided by the formula of Gall et al. (2014). The results found that the adoption of sustainable procurement practices has a significant impact on the performance of horticulture exporting firms in Kenya. The study recommends adopting a sustainable purchasing policy, sourcing, and sustainable supplier development to enhance the performance of horticulture exporting firms in Kenya. The findings have implications for policy development, sustainable procurement strategies, and practices.

Keywords: Sustainable Procurement, Adoption, Performance, Horticulture, Exporting Firms, Procurement

Introduction

Adopting Sustainable supply chain Management (SSCM) is a critical enabler that improves economic, environmental, and social performance. It also allows firms to achieve a new set of competencies. Therefore, gaining a competitive advantage over other firms Saeed and Kester (2023). Sustainable activities such as the use of eco-friendly packaging, improving working conditions, using more fuel-efficient transportation, and requiring suppliers to undertake environmental and social programs are examples that can reduce costs and increase sales and market share while at the same time improving corporate reputation. SSCM has emerged as a management paradigm enabling firms to realize sustainable competitive dimensions (Saeed et

al., 2023). SSCM is a powerfully growing area of research (Ansari & Kant, 2017). Despite the initial research focus being on the environmental aspects of the supply chain (SC), with time the interest has shifted to sustainability globally.

Global consumption of horticultural produce has significantly increased due to population growth, leading to increased demand. However, if production and distribution are not managed correctly, it can cause severe global, economic, social, and environmental problems (Lee & Rammohan, 2017). According to Bouchery et al., (2017), adopting sustainability is critical as regulators move more from the cradle to the grave perspective in formulating stricter regulations on sustainability (Zhu et al., 2010; Syahrudin & Kalchischmidt, 2018). The demand to comply with global standards while exporting products to developed nations has pressured firms to integrate sustainability in SC. This is confirmed by Saeed and Kersten (2023), who note that incorporating environmental and social responses into supply chain management is becoming increasingly relevant to the success of the firm and its supply chain. In compliance with global standards on sustainability, several legislations, policies, and strategies have been developed to address sustainability issues across the SC.

In Kenya, the 2010 Constitution and the launch of Kenya Vision 2030 place a high premium on the environment, promoting sustainability and environmental protection issues (KIPRA, 2023). Consequently, the Government has implemented the EMCA Act of 1999, which provides a legal and institutional framework for managing the environment and related matters. Under clause 3(1), every Kenyan is entitled to a clean and healthy environment. Therefore, there is a need to safeguard and enhance the environment. Wachira (2014) revealed that many Kenyan firms have yet to develop policies incorporating concerns about SSCM. However, considerable progress has been made with firms developing sustainable strategies. The firms incorporating these strategies in Kenya include Mumias Sugar, Standard Chartered Bank, HFCK, and KCB. The traditional spectrum on firm performance meant higher profit and ensuring value to shareholders to measure firm performance. Export performance refers to a firm's global market performance in terms of sales, market share, export volume (quantity exported), and profits earned (Osoro et al., 2024; Kimutui & Awuor, 2022). A nation's exports are an indication of foreign exchange earned which contributes significantly to economic growth and job creation. According to scholars like Awino (2015), performance should be viewed both on financial indicators and non-financial measures. Today, performance in sustainability is measured holistically and includes environmental degradation, employee safety, and ethical and social responsibility.

Kenya's horticulture export is the second biggest foreign exchange earner after tea, accounting for 21.4% of the total value of exports. The total horticulture export was estimated at US\$ 1 Billion (Kenya National Bureau of Statistics (KNBS 2020). Kenya is the largest exporter of vegetables to the European Union, including beans, peas, and avocados. The second-largest developing-country exporter of flowers in the world after Colombia. (Tyce 2020). Major importers include the UK, Germany, Netherlands, France, and Belgium, with the highest quantity of export being through supermarket chains that include Tesco and Salisbury in the UK and Lidl in Germany. The Horticulture sector continues to perform positively, indicating a 5%

improvement in earnings compared to 2019. Despite its improved performance, the horticulture sector continues encountering challenges that hinder its full potential and economic contribution. Essential among them is the strict market requirement. Global competition is moving from price and basic quality parameters to a market requirement beyond the inspection and acceptance of end products and toward sustainability in its supply chain (Dospinescu and Dospinescu, 2018).

Statement of the Problem

Despite interventions by the government encouraging the adoption of sustainable procurement, the performance of horticulture exporting firms in Kenya lags. According to USAID (2023), Kenya's export performance is below its potential compared to other developing countries like Egypt, South Africa, and Morocco. Horticultural export in Kenya constitutes less than 5% of the total production, with most of the produce going to waste. According to a global competitiveness study commissioned by USAID, Kenya's global market share fell from 1.28% in 2008 to 1.03% in 2017. Extant studies have pointed out that the lagged growth could result from inadequate adoption of sustainable procurement. Notwithstanding, Kenya's horticulture exporting firms have been unable to meet European consumer requirements, as evidenced by a surge in produce rejection. For instance, in 2014, Kenyan flower farmers were locked out of the EU market. These trends have put Kenya's market share in the EU at risk (KIPPRA, 2023).

Objectives of the Study

To determine the relationship between the adoption of sustainable procurement and the performance of horticulture exporting firms in Kenya.

Research Hypothesis

H₀₁: There is a significant relationship between the adoption of sustainable procurement and the performance of horticulture exporting firms in Kenya.

Literature Review

Theoretical Perspectives of the Diffusion of Innovation Theory

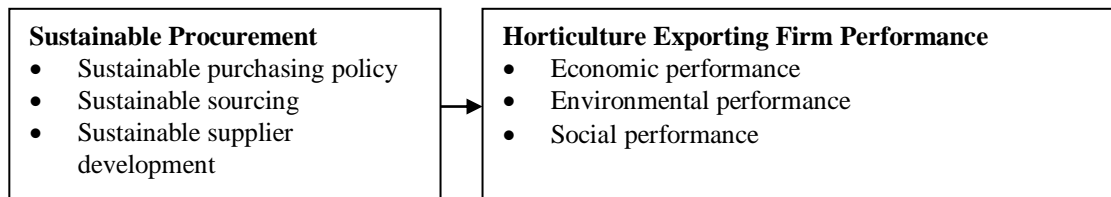
This theory seeks to explain how, why, and at what rate new ideas and technology spread. It was first popularised by Rogers (1995), who defined diffusion as the process by which an innovation is communicated over time among the participants. Theory is an essential aspect of research on independent variables. The success of adopting sustainable practices in SC in the horticultural sector will depend, according to Rogers (1995), on how the idea is communicated among the firms. However, a lack of information, inspiration, and persuasion will result in a deficiency in developing interest, especially among small farmers. However, later, with the dissemination of information, the farmers make a voluntary informed decision based on the empirical evidence of the advantages. Scholars recognize the characteristics of potential adopters that determine the success of innovation, including relative advantage, efficiencies, compatibility, and complexity (Infante, Rancer, & Womack 1997; Rogers 1995).

Sustainability in the horticulture sector requires moving from the traditional way of doing things. It calls for innovation in product development these include developing seeds, fertilizers, and pesticides including fungicides that are more environmentally friendly. It calls for sustainable

processes including sourcing, packaging, planting, and use of water resources in an eco-friendly way. Innovation differentiates the firm from its competitors. The theory is relevant to this study as early adoption of SSCM will largely depend on the firms' perceived value in terms of increased sales and export market growth among other advantages. In contrast, later adoption will be rooted in the growing legitimacy of the processes through institutional pressure (Pagell & Wu, 2011).

Independent Variables

Dependent Variable



Adapted from Saeed and Kersten (2023) and Yaw Agyabeng-Mensah et al., (2020)

Figure 1: Conceptual Framework

Review of Empirical Literature

Sustainable procurement is the process where firms meet their needs for goods, services, works, and utilities in a manner that attains value for money on a whole life cycle basis. In terms of generating benefits for the organization, the economy, and society while decreasing negative environmental effects (UNEP, 2012). In the horticulture sector, procurement involves sourcing inputs that include seeds, fertilizers, agrochemicals, farm equipment, and irrigation equipment that have minimum negative effects on the environment. Environmentally friendly materials, fair trade, sustainable recycled material, and product cost are key elements of sustainability. Procurement professionals when sourcing must ensure materials, equipment, and services acquired have minimal or no impact on the natural environment. This is unlike the conventional SC sourcing process where the predominant evaluation standard is price. Grant et al., (2017) posit that firms should develop sourcing policies that consider the carbon impact at primary production, these require broader strategic decisions on the management part while purchasing. For horticulture firms to achieve these, strategies such as providing eco-attribute specifications to suppliers are required (Akhavan& Beckmann 2017). When evaluating sustainability criteria should also be made mandatory. Balasubramanian & Shukla (2017) emphasize that purchasing policies, programs, and procedures should guarantee materials purchased comply with eco-attribute standards. Sustainability requires innovation in SC processes including horticulture production, purchasing, and packaging. To achieve these collaboration and cooperation with suppliers is crucial.

The process involves horticulture firms selecting, developing, coordinating, partnering, and communicating with the key Suppliers to successfully adopt sustainability. Several researchers have identified initiatives that firms can incorporate to achieve sustainability. These include developing a supplier-sustainable questionnaire to determine suppliers' stance on sustainable issues, integrating key suppliers, and collaborating on the specification, creating a platform

among the SC partners through organizing sessions or awareness seminars, developing techniques to measure and report on the level of progress in suppliers' sustainability practices. Monitoring and assessing ecological practices among the firm Suppliers and establishing an integrated end-of-life management process (Michelsen et al., 2020; Hu & Hsu, 2021; Wong, 2013). Cross-functional collaboration between different parties within the horticulture firm is key to sustainability. It involves developing firm policy and strategy and integrating SSCM into management strategy and system, sharing information through technology. This is important as sustainability impacts every aspect of SC within a firm. It covers all phases of a product's life cycle, summarised as design, sourcing, production, and logistics. (Weele & Tubergen 2024; Akhavan & Beckmann 2017; González-Benito et al. 2016).

Adopting SSCM in the horticulture sector can be argued as a means of increasing sales, leading to export growth through gains in existing markets or access to new markets. Bouchery et al., (2017) argue that an initiative-taking approach to sustainability goes hand in hand with increased sales, further noting that SC operations are crucial to boosting firm performance. Overall economic firm performance for horticulture export produce encompasses export sales, export market share growth, foreign markets served, the profitability of exported products, the number of products sold, and the value of exports (Kim & Hemmert, 2015; Spanos 2016). In this study economic performance is measured in terms of export growth that is new market served, and an overall turnover of sales. The DJSI 2008 report, affirmed a positive strategically significant correlation between corporate sustainability and financial performance. Environmental performance and social performance are measured in terms of non-financial measures.

Environmental performance is measured in terms of reduction in emission of environmentally harmful gases, and elimination of harmful production processes in the horticulture processes originating from all stages of SC. This starts with sourcing raw materials and waste generated from the production process. According to Tseng et al., (2014), the horticulture producer can reduce the waste of resources if better utilization is established. Environmental performance can be achieved through the reduction of the cost of production in the long run. In the warehouses, strategies include adopting new technology, innovations such as computerized climate control, and thermal insulation gas combustion condensers that generate alternative heat. Innovation within sustainability significantly impacts firm performance due to its positive impact on market share and reputation (Lin et al., 2014). Given that emissions could represent inefficiencies its reduction results in savings that impact sales. The reuse of materials in packaging reduces costs and has a positive impact on the environment, impacting the competitiveness of products in the market. One of the objectives of SSCM should be to improve environmental performance. This results in improved sales, increased sales volume, and a positive firm reputation Ochieng (2016). In this study, environmental performance has been measured in terms of operational efficiency and cost implication as a result of the adoption of SSCM.

Social performance has been measured in terms of the reputation of the firm. Customer influence is becoming a fundamental market force as demand for sustainability increases. SSCM if implemented has a positive reputation leading to increased sales, while non-adoption results in

the waste of products contributing to loss of revenue. A study by Weber (2012) found that 60 percent of a company's market value is attributable to its reputation. Over two-thirds of US consumers avoid products made by companies they dislike with consumers asserting labels to identify the parent company. According to studies done by Wanjohi (2016), a reputation for integrity and respect can build customer loyalty based on distinct values differentiating the brand from the competitors. Other reputation risk studies have shown positive environmental impacts of products and processes including social ethics with improved brand reputation. Brand recognition and corporate reputation can be enhanced through "strategic philanthropy" to support sustainable causes generating positive publicity and goodwill among various stakeholders therefore creating value through more loyal customers (Dospinescu et al.,2020; Barauskaite & Streimikiene 2021).

Adoption of SSCM provides access to new markets resulting in improved financial performance via sales gains from enhanced reputation Barauskaite & Streimikiene (2021). Similarly, other sustainable conscious initiatives, such as alternative energy or reduced emissions below regulatory requirements impact positively on corporate reputation Jacob et al., (2018). Carter & Roger (2018) found out that sustainable firms are significantly more likely to be members of DJSI and are significantly more likely to be rated among Fortune's 100 "Best Companies to Work for" than their competitors therefore the improved recognition and reputation could potentially lead to increased sales. In their study Doszhanov, & Ahmad (2015) affirm that there is significant correlation between green brand awareness, green brand trust, green perceived value, and customers' intention to use green products.

Research Methodology

Research Philosophy, Research Design, Population and Sampling Technique and Sample Size

The study adopted a positivist research paradigm which is an epistemological position, characterized by a belief in theory. This is before conducting research with the statistical justification of conclusions from empirically testable hypotheses, which is the core of tenets of social science (Cooper & Schindler, 2011).

The research employed a cross-sectional survey research design. The target population was 645 registered firms with Horticultural crops directorate (2020). The respondents included either the Supply Chain Officer, the Operation Officer/Manager, the Logistic Officer, or the Senior Staff in management involved in the day-to-day supply chain operation of each Horticulture firm. The sampling frame consisted of the 240 firms registered with the Horticultural Crops directorate as guided by Gall et al., (2014) formula. The data was collected between December 2023 and June 2024. The respondents were not rewarded for their responses. Data collection involved interviews through semi-structured questionnaires, digitized using the Open Data Kit (ODK), and administered using smartphones.

Data Collection Measurement and Analysis

In this study, primary data mainly utilized questionnaires with the constructs measured by a five-point Likert scale. The hypotheses testing the correlation between adopting sustainable procurement was measured by a linear regression model. The general linear regression model

was.

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

Where, Y= is the dependent variable (performance of horticulture firm performance in Kenya).

β_0 = is the Constant (Co-efficient if intercept)

β_1 , is the beta coefficient,

X_1 = Sustainable Procurement

ε =error term

Research Findings and Discussions

The total number of questionnaires administered was three hundred. The total number of respondents was 245. The six sustainable procurement constructs had a Cronbach Alpha of 0.86, indicating an elevated level of internal consistency. Each construct using Rykov's rho is indicated as omega. Rykov's rho was above 0.4 thereby indicating high validity of each latent variable. Linearity of the study was done using an ANOVA test to visually show if there was a linear or curvilinear relationship between two continuous variables before carrying out regression analysis. Shapiro-Wilk statistics showed that the data confirmed to a normal distribution.

Descriptive Statistic on Sustainable Procurement

The objective was to determine the relationship between sustainable procurement and the performance of horticulture exporting firms in Kenya. Using a five-point Likert scale, the study sought to know the respondent's level of agreement on various statements relating to sustainable procurement. Table 1 is a presentation of the findings. The study measured Sustainable procurement by three sub-variables: Sustainable Policy, Sustainable Sourcing, and Sustainable Supplier Development. Descriptive statistics on how well sustainable procurement was articulated in the firm's policy statement showed that sustainable procurement was well articulated at (M = 4.22, SD =0.65). It also formed part of a firm's strategic plans (M= 4.19, SD =0.67). Sgarbossa and Russo, (2017) agree noting that in meeting sustainable requirements Managers and Policymakers need to develop a sustainable supply chain. Adherence and compliance with sustainability legislation during registration of suppliers is strictly adhered to among horticulture exporting firms represented by (M= 4.22, SD =0.69). Suppliers are required to be compliant with sustainability procurement practices for them to be eligible for business, this is done during evaluation or qualifications. One of the mandatory requirements is compliance with sustainability regulation/policy (M = 4.06, SD =0.73). Ahmadi (2020) summarizes that the typical evaluation criteria focused on the economic dimension such as cost, quality, and delivery time. However, the evaluation of the Supplier's Sustainability is particularly critical. Scholars such as Pedroso et al., (2021) qualify the importance of incorporating the environmental and social dimension of the "Triple bottom line" into the evaluation criteria. Maaloul (2023) qualifies this noting that integrating sustainability requirements into the Supplier's evaluation criteria is not only a compliance with regulations requirements, but also enhances firm reputation. Horticulture firms confirmed deliveries to the firm are thoroughly inspected to ensure compliance with sustainability before being accepted for use at (M = 4.27, SD =0.70). Many firms encouraged long-term supplier relationships to ensure sustainability (M

= 4.16, SD=0.70). This is in concurrence with Feng et al., (2018) and Grant et al., (2024) who concur that collaboration between a firm and its supply chain partners, such as customers and suppliers, is essential to implementation of sustainability.

The aggregate mean of 4.18 and standard deviation of 0.69, affirm that the respondents that sustainable procurement contributes to a firm’s performance. Therefore, sustainable policy, sustainable sourcing, and sustainable supplier development are crucial factors impacting on firm performance of horticulture firms in Kenya. This is in concurrence with the finding by Balasubramanian & Shukla (2017) that purchasing policies, programs, and procedures guarantee materials purchased comply with eco-attribute. Grant et al., (2024) emphasize the importance of sustainable sourcing decisions at the policy level. This ensures compliance with the sustainability regulatory framework. Studies advocate for the procurement of sustainable, eco-friendly biodegradable, recyclable materials, unlike conventional materials that contribute to pollution, excess waste, and resource exhaustion. Sourcing eco-friendly material has a positive environmental impact according to scholars (Okogwu et al., 2023; Makhulo 2017).

Table 1: Descriptive statistics on Sustainable Procurement

Statement	Mean	Std.Dev
Sustainable procurement is well articulated in the firm’s policy statement.	4.22	0.65
Sustainable procurement considerations form part of the firm's strategic planning.	4.19	0.67
Compliance with legislation on sustainability during registration of Suppliers is strictly adhered to e.g. (Environmental, ethical, or fair trade).	4.22	0.69
During the evaluation/qualification of the bidders, compliance with sustainability regulations/policy forms part of the mandatory (must-have) evaluation process.	4.06	0.73
Deliveries of goods are inspected before acceptance for use by the firm mainly to ensure compliance with sustainability.	4.27	0.70
Long-term Supplier relationships are encouraged to ensure the success of sustainability.	4.16	0.70
Aggregate Mean	4.18	0.69

The respondents were asked which other eco-attributes they considered key in ensuring adherence to sustainability during procurement, from the response it was noted that sustainable policy and supplier development are crucial. Sourcing of renewable, biodegradable, non-toxic materials, is key. This ensures products have minimum carbon emissions and other pollutants that are critical in the horticulture sector. Training of staff on sustainable procurement was another key factor in ensuring sustainability according to the respondents. This concurs with Gopalakrishnan et al., (2020) who notes that educating employers and stakeholders on SSCM fosters a culture of sustainability within the firm. Ensuring the adoption of biotechnology in the procurement and disposal process is key to ensuring minimal carbon emission, and minimal disposal of non-biodegradable materials according to a respondent who further recommended “*Recycling the waste materials to minimize pollution of air and water. SSCM entails*

coordinating resources, processes, and activities to produce and distribute horticulture export. It encompasses the entire life cycle of a product from raw material design and production to eventual disposal or recycling (Nyambura and Mwenda (2020). The choice made at each stage of the supply chain influences and impacts the environment (Okongwu et al., 2023).

Performance of Horticulture Firms

The main objective of the study was to establish the relationship between a Sustainable Supply Chain and the performance of horticulture exporting firms in Kenya. Table 2 is a presentation of the findings. The performance was measured through economic, environmental, and social performance. The researcher sought to determine the Economic performance of firms registered with HCD. From the respondent's responses, most of the horticulture firms' sales in volume units had increased in the three preceding years (Mean = 3.95, SD =0.83), with the majority of firms having increased sales in terms of monetary value in the three preceding years, (Mean = 3.85, SD=0.87). On environmental performance, the majority agreed that procurement of environmentally friendly materials had resulted in huge savings (Mean = 4.02, SD=0.81). With the use of fuel-efficient vehicles, the cost of operation in logistics and transportation was reduced (Mean = 3.91, SD=0.88). Most horticulture firms saw a reduction in cost as a result of efficiency in warehouse operation e.g. control of temperature (Mean = 4.21, SD=0.65). The positive firm performance could be partly attributed to a reduction in the cost of production due to energy saving according to most respondents (Mean = 4.09, SD=0.79). Material recovery through the reuse or recycling of materials in packaging resulted in savings (Mean = 4.08, SD=0.76). Most respondents agreed that certification of produce as environmentally friendly had resulted in improved penetration of the market (Mean = 4.18, SD=0.70). This is in concurrence with Okogwu et al., (2023) who postulate that the choice made by a firm at each stage of the supply chain impacts the environment and contributes to performance. Velenturf, A. P., & Purnell, P. (2021) further hypothesize that SSCM aligns with the principle of circular economy which aims at keeping resources as long as possible extracting maximum value and minimizing waste of products with recycling and reusability in mind.

On social performance, respondents concurred that health complaints related to the work environment among staff had reduced since adopting sustainability (Mean = 4.24, S=0.74). Respondents concurred with the statement that their firms were involved in several community social responsibility programs with the community (Mean = 3.91, SD=0.84). Most respondents agreed that their firms would be rated among the best firms in the horticultural sector regarding work satisfaction, (Mean = 3.93, SD=0.74). Health and other welfare issues were given priority and addressed accordingly. (Mean =4.26, SD=0.62). Many respondents agreed that workers were provided with safety protective gear in the workplace (Mean = 4.25, SD=0.69).

The aggregate mean of 4.07 and standard deviation of 0.76 indicate that economic, environmental, and social performance are crucial factors impacting the performance of horticulture exporting firms in Kenya.

Table 2: Descriptive statics on Firm Performance

Statement	Mean	Std.Dev
Economic Performance	3.95	0.83
The firm’s sales have increased in Volume (In Units) in the last three years		
The firm's sales increased (KES) in the last three.	3.85	0.87
Environmental performance		
The procurement of environmentally friendly raw materials has resulted in major savings.	4.02	0.81
The cost of operation in logistics has been reduced in terms of transportation e.g., by using more fuel-efficient vehicles.	3.91	0.88
There is a reduction in wastage during warehouse operations as a result of sustainable practices e.g., control of temperature zones, electricity, and water.	4.21	0.65
Sustainability in the supply chain has resulted in a reduction in the cost of production due to energy-saving costs.	4.09	0.79
Material recovery through the reuse or recycling of materials in packaging has resulted in savings.	4.08	0.76
Certification of products as environmentally friendly has resulted in improved penetration of the market.	4.18	0.70
Social Performance		
Health complaints related to the work environment among Staff reduced since the adoption of sustainability.	4.19	0.67
The firm is involved in several CSR projects with the community.	3.91	0.84
The firm is likely to be rated among the best firms in the horticultural sector in terms of work satisfaction	3.93	0.74
Human health issues are given priority and any issues that may affect workers’ well-being are addressed accordingly.	4.26	0.62
All workers are provided with safety protective gear in the workplace	4.25	0.69
Aggregate score	4.07	0.76

The respondents were requested to give suggestions on how performance can be improved through SSCM the respondents recommended minimum wastage of materials, reusing, or recycling resulting in a reduction of the cost of disposal. They further suggested that the government had a role to play in reducing the costs of inputs. Similarly, the government should put more effort towards a stable currency and reduced levies. This is in the proposition by Wren, B. (2022) who argues that government policies and certification can sensitize businesses to prioritizing sustainability. This is through incorporating eco-friendly materials and through regulatory framework support. Therefore, facilitating competitive advantage. Captured by this response. *“Improving economic performance through sustainability is not only possible but also increasingly recognized as a sound business strategy”*. Further proposition according to another respondent *“Sustainability and compliance bring confidence in the market thus improves the economic performance”*.

On environmental performance, other suggestions from the respondents included the reduction of toxins, carbon released, and carbon sinks making the environment safer. These include the protection of natural resources resulting in increased safe materials. Protected biodiversity results in reduced pollution in soil, resulting in better yields and the availability of clean and safe water. One of the respondents summarized, *“Biodiversity Conservation, Chemical Management, Sustainable Transportation, Sustainable Sourcing, Eco-friendly Packaging, and Sustainable Agriculture Practices”*. Overall, *“Less pollution of the environment would mean better living conditions for all and better respiratory health”*.

Sustainability has been defined as the process of integrating environmental practices into supply chain activities (Chin et al., 2023). Minimize or eliminate solid waste, reduce pollution, and energy consumption, and conserve resources. It involves the entire supply chain from produce design to end-of-life (Eltayeb and Zailani, 2024). Adoption of SSCM according to scholars can effectively reduce greenhouse gas emissions (reduced carbon footprint), minimize waste generation, and contribute to the preservation of the eco-system through resource conservation and waste reduction (Okogwu, et al., 2023). Overall sourcing sustainable materials, optimizing transportation routes, and adopting eco-friendly packaging solutions in SSCM are grounds for sustainability and its impact on the planet (Makhulo, 2017).

On social performance, the majority felt that sustainability had a positive social impact. Sustainability efforts are crucial for fostering positive relationships with employees, communities, customers, and other stakeholders benefits to the worker include fair wages, equity treatment, offering an environment that motivates improved performance, increased welfare of staff, and better health due to minimum pollution. Engagement of the community encourages bonding resulting in improved quality of life, creates local job opportunities, and economic development through community partnership, and collaborates on social initiatives, such as education, healthcare, and infrastructure development. This is in concurrence with Okogwu et al., (2023) who prostrate that SSCM fosters positive relationships with the local communities. Qualifying that responsible sourcing and production increased community well-being, and reduced conflict related to resource extraction. Sustainable materials are non-toxic resulting in reduced health risks for workers and consumers resonating with social responsibility and ethical business practices.

Therefore, ethical supply chain responsibility involves ethical labor practices, fair wages, and sourcing through traceability of produce, which can be audited therefore, enabling the customers to have product information of the produce that they are consuming.

Correlation Analysis of the Study Variables

Correlation analysis was computed to ascertain the strength and the direction of the relationship between the two variables being studied. Correlation is, therefore, the degree of association between two variables while correlation coefficient is a scale to measure the strength of linear associates also known as Karl Pearson's coefficient of correlation (Product moment correlation coefficient Kothari (2013). Correlation is computed by testing the strength and direction between the independent variables and the dependent variable. In this study correlation analysis was done to test the relationship between Sustainable Supply Chain Management and Firm performance in

horticultural exporting firms. Person "R" is used to measure the strength and the direction of the linear relationship between the independent variable and dependent variable, if $r = \pm 0.1$ to ± 0.29 the association between the two variables is considered small; when $r = \pm 0.3$ to ± 0.49 ; this is medium, and if $r = \pm 0.5$ or above it is deemed strong. Therefore, a strong relationship relates to variables under contemplation.

Correlation Analysis for Sustainable Procurement and Firm Performance

The correlation analysis between Sustainable procurement and horticulture firm performance results in Table 3 revealed that the Pearson correlation coefficient of $r=0.520$ is strong and statistically significant ($p < 0.05$) implying a strong relationship between sustainable procurement and the performance of horticulture exporting firms. The finding aligns with Zailani et al., (2015) who underscored eco-friendly purchasing had a positive correlation with firms' performance.

Table 3: Correlation Analysis for Sustainable Procurement

Correlations		Procurement	Firm Performance
Procurement	Pearson Correlation	1	.520**
	Sig. (2-tailed)		.000
	N	244	244
FP	Pearson Correlation	.520**	1
	Sig. (2-tailed)	.000	
	N	244	244

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

Regression Analysis

Regression is a statistical tool meant to investigate the relationship between variables allowing for modeling, examining, and exploring relationships. Regression analysis is also used for prediction (Wachiuri 2019). The model summary was used to measure the variation in the dependent variable resulting in changes in the independent variables. In this study, the model summary was used to establish the variation in the performance of Horticulture exporting firms in Kenya as a result of the adoption of a sustainable supply chain. **H₀₁**: There is no significant relationship between the adoption of sustainable procurement and the performance of horticulture exporting firms in Kenya. The researcher uses the linear regression model to evaluate the statistical relationship between the adoption of sustainable procurement and firm performance. The model summary results of the study are illustrated in Table 4. The R-squared of the result of the model is 0.285. The result implies that the adoption of sustainable procurement accounted for 28% of the variability in the performance of horticultural exporting firms in Kenya.

The Analysis of Variance (ANOVA) model analysis of the variance is illustrated in Table 5. The F-value of this model is 96.412 at a significant level of < 0.05 . This shows that the model can

statistically predict the relationship between sustainable procurement and the performance of the horticultural firms in Kenya. The regression coefficient for the model is shown in Table 6. The Beta Coefficient for the adoption of sustainable procurement is 0.557 This denotes that the adoption of sustainable procurement influences 55.7% of performance in the horticultural exporting firms in Kenya. Therefore, for every one-unit increase in sustainable procurement practices, the performance of horticulture exporting firms increases significantly by 0.557 units. The P-value of the variable is $0 < 0.001$. The result presumed that the adoption of sustainable procurement exerts a significant influence on the performance of horticultural exporting firms in Kenya.

Table 4: Model Fitness

Model Summary						
Model	R	R Square	Adjusted Square	R	Std. Error of the Estimate	
1	.534 ^a	.285	.282		.504	
a. Predictors: (Constant), Procurement						
b. Dependent Variable: Performance						

Table 5: Analysis of Variance

ANOVA						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	24.448	1	24.448	96.412	.000
	Residual	61.367	242	.254		
	Total	85.816	243			

a. Dependent Variable: Performance
 b. Predictors: (Constant), procurement

Table 6: Regression of coefficients

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.737	.240		7.248	.000
	Procurement	.557	.057	.534	9.819	.000

a. Dependent Variable: Performance

Therefore, sustainable procurement practices significantly impact the performance of horticulture exporting firms in Kenya. Consequently, the null hypothesis that adopting sustainable procurement practices does not significantly impact the performance of horticulture exporting firms in Kenya is rejected, and the alternative hypothesis is adopted. This concurs with Islam et al., (2017), who concluded from his study that the adoption of sustainable procurement was

statistically significant on firm performance. Silva and Nunes (2022) note that sustainable procurement can enhance profitability and overall organizational performance. Further studies by Kariuki (2023) confirm a significant relationship between green procurement and firm performance. Further, by substituting the beta values and the constant term from the coefficient's findings for the first step regression modeling as in Table 4, the following regression model will be fitted: $Y = 0.550 + 0.846 X$ (X is Sustainable Supply Chain Management). The findings show that when Sustainable Supply Chain Management is held to a constant zero, the performance of Horticulture exporting firms in Kenya will be at a constant value of 0.550. The findings also show that Sustainable Supply Chain Management practices have a statistically significant effect on the performance of Horticulture exporting firms in Kenya, as shown by a regression coefficient of 0.846 (p-value= .000).

Conclusions and Recommendations

Conclusion of the Study

A descriptive analysis of sustainable procurement revealed that procurement policy is well articulated in the Horticulture exporting firms, with sustainable procurement forming part of the strategic planning in the sector. The study reveals that sourcing renewable gradable, non-toxic products with minimum carbon emission is indispensable in the horticulture sector. Strict adherence to issues of sustainability during registration or qualification of supplies is predominant. Other critical consideration during the sourcing of production materials in horticulture includes environmental impact on the materials procured, ethical practice, and fair-trade consideration. During the evaluation of bidders, a must-have or mandatory criterion is sustainability certification. The study revealed materials delivered in the warehouses are mostly inspected before acceptance to ensure compliance with sustainability requirements. Long-term Supplier relationships both upstream and downstream are encouraged to ensure the success of sustainability. The study also revealed that training of staff was key to ensuring a sustainable procurement process and ensuring the adoption of biotechnology. This is key, especially during the disposal process in ensuring minimum disposal of non-bio gradable materials. Correlation analysis shows that sustainable procurement and firm performance in horticultural exporting firms in Kenya are significantly associated. Regression analysis indicates that procurement has a positive and significant influence on the performance of horticulture exporting firms. The hypothesis result indicates a significant relationship between sustainable procurement and firm performance in horticulture exporting firms in Kenya.

The hypothesis was, "There is no significant relationship between the adoption of sustainable procurement and the performance of horticulture exporting firms in Kenya." The study reveals that adopting sustainable procurement is statistically significant in explaining the performance of horticulture exporting firms in Kenya. This means that a unit's adoption of sustainable procurement positively impacts the performance of the horticulture exporting firm. Based on the evidence, the study concludes that adopting sustainable procurement positively and significantly relates to the performance of horticulture exporting firms.

Recommendation of the Study

The study recommends that horticulture exporting firms in Kenya adopt and leverage sustainability to remain competitive and expand in terms of the market served ultimately improving the firm performance. These call for sustainable strategies, including sustainable procurement, to enhance performance. Adopting sustainable procurement requires articulating sustainability as a strategic role in the firm forming part of the policy statement for successful implementation. The study recommends an evaluation criteria on sustainability when qualifying or evaluating suppliers, sustainability should form part of the mandatory criteria. For successful implementation of sustainability in the horticulture sector proper inspection of delivered goods for compliance with sustainable specifications is required. Strengthening Supplier relationships and moving towards a collaborative approach to ensuring the full adoption of sustainable practices along the supply chain. By establishing partnerships with suppliers, horticulture firms can explore innovation and mutually benefit from the latest technology and innovation in the horticulture export business.

Research limitations

The study conducted had limitations. The horticulture sector is vibrant. It involves dealing with the perishable produce for export. The production process is also seasonal meaning it has different timelines. This posed a challenge when engaging with the respondents. The researcher had to follow up and remind the respondent to respond to the questionnaire. When the respondents were challenged in filling in the questionnaire the Researcher would request an appropriate time and help the respondent fill in the questionnaire and clarify any of the questions that were not clear. Initially, some respondents were hesitant to fill in the questionnaire fearing the repercussions however, the researcher reassured the respondents that this was purely for academic purposes. Due to the challenges, it took a longer time than initially anticipated to collect the data.

Areas of Further Study

The study limited itself to four variables (procurement, production, logistics, and internal supply chain management) meaning the empirical review was limited to these variables. Therefore, other studies can be conducted on different variables e.g., the adoption of technology towards sustainability. This study limited itself to institutional pressure as the moderator. Further studies for example the moderating effect of firm size on the adoption of sustainability in the supply chain. Studies show that firm characteristics such as firm size affect its performance. Smaller horticulture exporting firms may lack the resources required to adopt SSCM. Studies on SSCM in other sectors of the economy are recommended, including the manufacturing sector, hospitality, public sector, university, and other important sectors of the economy. The study was conducted in Kenya, comparative studies from different regions can be studied, especially among the major horticulture exports which include Egypt, Morocco, and South Africa. Most scholars in SSCM in Africa are based in Ghana therefore more scholars from other African countries should explore the topic enabling the continental to build a more sustainable future.

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