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Environmental Considerations and Performance of Agricultural Firms in Kiambu County, Kenya

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Abstract

Agricultural firms in Kiambu County play a significant role in Kenya's economy through their contribution to agricultural production, employment, and livelihoods. However, these firms continue to experience performance challenges associated with operational inefficiencies, resource wastage, declining profitability, and environmental risks. Despite the growing emphasis on environmental sustainability, the extent to which environmental considerations influence the performance of agricultural firms remains insufficiently established. Therefore, this study sought to examine the influence of environmental considerations on the performance of agricultural firms in Kiambu County, Kenya. Specifically, the study focused on eco-friendly products, environmental regulatory compliance, carbon footprint management, and environmental audits. The study was anchored on the Triple Bottom Line Theory and adopted an explanatory research design. The unit of analysis comprised 200 registered agricultural firms in Kiambu County, while the unit of observation consisted of heads of procurement, finance, operations, quality assurance, and marketing departments. The target population comprised 1,250 departmental heads, from whom a sample of 305 respondents was selected using Slovin's formula. Stratified random sampling was employed to ensure representation of the respective departmental categories. Primary data were collected using semi-structured questionnaires. A pilot study involving 31 departmental heads from agricultural firms in Murang'a County was conducted to assess the validity and reliability of the research instrument. Qualitative data were analyzed thematically, while quantitative data were analyzed using Statistical Package for the Social Sciences (SPSS) version 28 through descriptive statistics, Pearson correlation, and linear regression analysis. Out of the 305 questionnaires distributed, 279 were completed and returned, representing a response rate of 91.48%. The findings established a strong positive and statistically significant relationship between environmental considerations and firm performance. Environmental considerations explained 33.5% of the variation in the performance of agricultural firms. The recommends that management of agricultural firms strengthen environmental sustainability initiatives by adopting eco-friendly products and sustainable materials, enhancing compliance with environmental regulations, prioritizing carbon emission reduction, and conducting regular environmental audits to improve operational efficiency, resource utilization, and overall firm performance.

Keywords: *Agricultural Firms, Economic Considerations, Performance, Eco-friendly products, Environmental Audits, Carbon Footprint*

INTRODUCTION

The agricultural sector plays a crucial role in global economic growth through employment creation, food security, and export earnings (Jin & Xu, 2022). However, agricultural firms face performance challenges, including low production efficiency, high operational costs, limited access to modern technologies, and declining market share due to increased competition (Mishra, 2021). Environmental considerations have therefore become essential in improving operational efficiency, reducing costs, and enhancing organizational performance (Celestin et al., 2024). They encompass four key components: adoption of eco-friendly products, compliance with environmental regulations, carbon footprint reduction, and environmental audits (Ndotono, 2023). These considerations involve organizational policies and practices aimed at minimizing negative environmental impacts while maintaining operational efficiency and meeting ecological standards and stakeholder expectations through continuous environmental monitoring, control, and improvement (Kipkemboi et al., 2021).

Globally and across Africa, environmental considerations have become an important component of strategic procurement, driven by the need to integrate environmental sustainability into organizational operations. The United Nations Sustainable Development Goals, particularly Goal 12, emphasize responsible consumption and production (Shaikh & Channa, 2022). In Brazil, environmentally responsible procurement practices have been associated with reduced environmental impacts, lower operational costs, improved corporate reputation, and stakeholder trust (Barbanti & Filho, 2022). Similarly, agricultural procurement in India emphasizes responsible sourcing, resource efficiency, and waste minimization (Celestin, Kumar, & Vasuki, 2024), while Australian beef firms integrate environmental considerations into procurement decisions (Ricketts & Richards, 2023). In Africa, the African Union and East African Community promote environmental sustainability, although implementation faces regulatory and technical challenges (Nduna et al., 2021). Nigerian firms emphasize environmental criteria in supplier selection and contract management (Basiru & Attah, 2023), while mining industries in South Africa, Zambia, and Botswana face resource depletion and pollution challenges (Celestin, Kumar, & Vasuki, 2024).

In Kenya, environmental considerations in procurement have gained increasing attention across horticulture, manufacturing, and construction sectors. Kariuki and Nyambura (2024) observe that environmentally responsible sourcing among horticultural exporters enhances environmental compliance, operational efficiency, and supply chain reliability, although adoption faces cost and supplier capacity constraints. Similarly, Nyoike and Ismail (2020) demonstrate that Unilever Kenya Limited integrates environmental considerations through supplier involvement and ICT adoption, improving compliance and supply chain monitoring. In Nairobi, Nyaga and Achuora (2020) highlight environmental compliance and responsible sourcing among food and beverage manufacturers, while Kongere, Lucas, and Nyakwara (2025) associate responsible resource utilization with improved construction project implementation. Further, Kilonzo (2025) emphasizes environmental considerations in procurement as contributors to operational efficiency and project sustainability at the Kenya Rural Roads Authority. These studies demonstrate the importance of environmental considerations in promoting resource efficiency, regulatory compliance, and organizational performance in Kenya.

Statement of the Problem

Kenya's agricultural sector remains a cornerstone of the national economy, contributing over 33% of GDP and providing livelihoods for more than 70% of the population (Kenya National Bureau of Statistics, 2020). However, globalization, increased competition, environmental degradation, and changing consumer preferences have increased pressure on agricultural firms to integrate environmental considerations into their business operations. Agricultural firms in Kiambu County, a major agricultural hub in Kenya, face the challenge of balancing operational and financial performance with environmental responsibility. Although some firms have incorporated environmental considerations into procurement decisions through environmentally responsible sourcing, resource conservation, waste reduction, and preference for environmentally friendly products, others continue to prioritize cost minimization and immediate operational needs over environmental concerns. This may contribute to resource inefficiencies, environmental compliance challenges, and increased operational costs, potentially undermining organizational competitiveness and profitability.

The performance challenges facing agricultural firms in Kiambu County further underscore the need for this investigation. As observed by Njeri, Omagwa, and Aluoch (2025), agricultural firms in Kiambu County, including dairy, horticulture, and agri-chemical businesses, reported declining profitability and market share between 2020 and 2024. In addition, a 2022 county report indicated that over 40 percent of agribusiness firms in Kiambu had experienced financial losses (Kiambu County Government, 2022). Gross sales for coffee cooperatives declined by 8.9% (from KES 732,761,561 to KES 667,889,159), while pyrethrum cooperatives recorded a decline of 35.7% (from KES 15,299,696 to KES 9,829,676) between 2020 and 2023. In contrast, dairy cooperatives experienced a marginal increase of 1.0% (from KES 5,099,362,852 to KES 5,152,757,909) (Omondi, Ndegwa, & Jagongo, 2024). Similarly, market share for most agricultural firms in Kiambu County remained low, with the majority controlling less than 25% of their respective local markets, highlighting limited competitiveness and growth potential. These trends raise questions about whether integrating environmental considerations into procurement decisions could contribute to improved resource efficiency, cost management, competitiveness, and overall firm performance.

Various studies have been conducted in Kenya on environmental considerations and organizational performance. For instance, Mdasha, Kariuki and Wanjohi (2023) examined the influence of environmental audits on the performance of large manufacturing firms in Kenya, focusing on the role of environmental auditing in organizational performance. Similarly, Mdasha, Kariuki and Wanjohi (2024) investigated the influence of environmental regulations compliance on the performance of large manufacturing firms in Kenya, while Mdasha et al. (2025) examined the effect of environmental awareness on the performance of large manufacturing firms in Kenya. However, these studies focused on specific environmental management aspects, namely environmental audits, regulatory compliance and environmental awareness, rather than examining environmental considerations. Furthermore, their focus was on large manufacturing firms, leaving limited empirical evidence on how environmental considerations influence the performance of agricultural firms. This creates a contextual and conceptual gap that the present study sought to address by examining the influence of environmental considerations on the performance of agricultural firms in Kiambu County, Kenya.

LITERATURE REVIEW

Theoretical Framework

This study was anchored on the Triple Bottom Line (TBL) Theory, introduced by John Elkington in 1994 and popularized in 1997. The theory posits that organizational success should be evaluated beyond financial performance to include social and environmental outcomes, commonly referred to as profit, people, and planet. It argues that organizations achieve long-term value and competitiveness by balancing economic objectives with social responsibility and environmental stewardship. According to Farooq et al. (2021), integrating environmental conservation and social well-being into organizational operations enhances sustainability rather than focusing exclusively on short-term profitability. The theory assumes that organizations are accountable for their impacts on society and the environment, that long-term profitability depends partly on responsible resource utilization, and that stakeholders increasingly expect ethical and environmentally responsible practices. Furthermore, efficient resource utilization, waste reduction, and environmental conservation contribute to cost savings, operational efficiency, and organizational competitiveness (Weidner, Nakata, & Zhu, 2021; Senyo & Osabutey, 2023).

The Triple Bottom Line Theory was relevant to this study because it explains how environmental considerations influence the performance of agricultural firms in Kiambu County, Kenya. Agricultural firms depend heavily on natural resources, particularly soil, water, and favourable climatic conditions, making environmental stewardship essential for sustained productivity (Muriithi, Mwanthi, & Chiroma, 2022). Through environmentally responsible practices, including the adoption of eco-friendly inputs, sustainable land use, water conservation, waste management, and environmental compliance, agricultural firms can minimize environmental degradation and improve resource efficiency. These practices can subsequently reduce operational costs, enhance product quality, strengthen relationships with surrounding communities, and improve competitiveness. Thus, the theory provides a foundation for explaining how integrating environmental considerations into organizational operations contributes to improved financial, operational, and environmental performance.

Conceptual Framework

Figure 1 shows the link between these variables. The independent variable was environmental considerations while the dependent variable is the performance of agricultural firms.

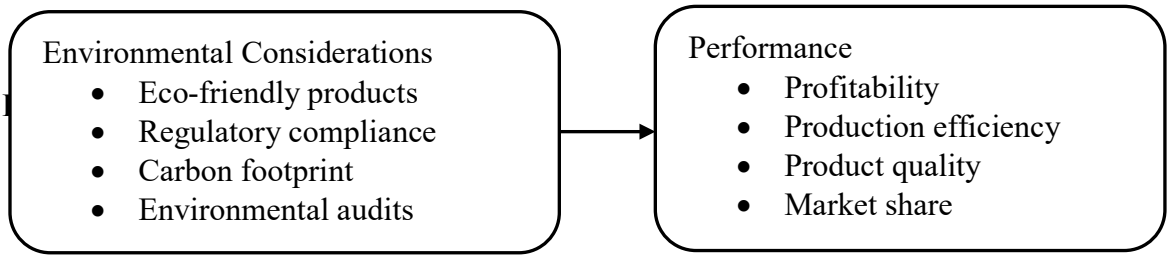


Figure 1: Conceptual Framework

Empirical Literature Review

Empirical studies have examined the relationship between environmental considerations and performance across different industries and organizational contexts. Kanagaraj et al. (2024) examined environmental considerations in Portland cement-based radiation shielding concrete. The research adopted a review research design. The target population comprised documented studies and case applications of Portland cement-based radiation shielding concrete used in

nuclear facilities, medical centers, and other radiation-sensitive environments. Data collection was conducted through a comprehensive literature review of relevant sources. The findings revealed that integrating environmentally friendly materials, including industrial by-products and recycled aggregates, significantly reduces the carbon footprint of Portland cement-based shielding concrete without compromising radiation attenuation performance.

In Vietnam, Pham (2024) conducted a study to investigate the impact of environmental audits on the performance of tourism companies. The study adopted a qualitative research design, focusing on 16 managers from 12 tourism companies across various sectors within the country. Data were collected through document analysis and direct interviews with the managers to gain in-depth insights into the implementation and effects of environmental audits. The findings reveal that environmental audits positively influence the performance of tourism companies by enhancing environmental management activities, improving corporate reputation, reducing operational costs, ensuring compliance with environmental regulations, and minimizing business risks. Additionally, audits were found to attract and retain employees, provide competitive advantages, and promote long-term sustainability. The study also highlights challenges such as limited resources, varying levels of environmental awareness, and company size, which can impede effective audit implementation.

In the South-South region of Nigeria Umanah and Sado (2025) examined the relationship between environmental considerations and the sustainability of Small and Medium-sized Enterprises (SMEs). A descriptive survey research design was adopted to investigate how stakeholders' perceptions and environmental regulations influence business sustainability. The target population comprised 317 respondents, including 105 environmental analysts, 106 consumers, and 106 SME executives. Data were collected using structured questionnaires. The findings revealed that stakeholders' perceptions significantly correlate with business sustainability, indicating that positive stakeholder engagement enhances SME performance. Environmental regulations were also found to have a significant positive effect, demonstrating that regulatory compliance promotes sustainable business practices. However, the relatively low explanatory power of the model suggests that other factors, such as financial management, market access, and innovation, also contribute to SME sustainability.

In another study, Solanke (2025) examined the influence of environmental audits on the financial performance of oil and gas firms. The study adopted a longitudinal research design, utilizing secondary data spanning 2013 to 2024 from financial reports of oil and gas companies. The target population comprised all publicly listed oil and gas firms in Nigeria during the study period. The findings indicate that environmental audits had an insignificant negative effect on financial performance. Additionally, environmental audits were found to have a positive and significant impact on return on assets, suggesting that proper environmental management improves the efficiency of resource utilization. The study also revealed a significant positive relationship between environmental audits and dividend per share, indicating enhanced returns to shareholders. Furthermore, environmental audits significantly improved earnings per share, demonstrating that sustainable environmental practices contribute to long-term profitability and investor confidence.

In Kenya, Mdasha, Kariuki and Wanjohi (2023) examined the influence of environmental audits on the performance of large manufacturing firms. The study utilized both descriptive and explanatory research designs. The target population comprised 499 employees from large manufacturing firms. Data were collected using structured questionnaires. The findings revealed that environmental audit practices positively and significantly influenced the performance of

large manufacturing firms in Kenya. Specifically, environmental checks and verification strategies were found to enhance operational efficiency and compliance with environmental regulations, directly contributing to improved productivity. Environmental management plan strategies were identified as critical in aligning environmental objectives with organizational goals, thereby reinforcing performance outcomes. Additionally, frequent environmental monitoring was shown to detect deviations early, enabling timely corrective actions that reduce risks and promote sustainability across firm operations.

RESEARCH METHODOLOGY

The study adopted an explanatory research design. The use of this design benefited the study by providing reliable evidence on how environmental considerations influence organizational performance, allowing for informed decision-making by managers and policymakers. The unit of analysis in this study was all registered agricultural firms in Kiambu County. According to Kiambu County Agriculture Office (2023), there are 200 registered agricultural firms in Kiambu County. The unit of observation was heads of procurement, finance, operations, quality assurance, and marketing departments in the 200 agricultural firms in Kiambu County. The target population was 1250 procurement, finance and operations managers in the 200 agricultural firms in Kiambu County. The sample size was determined using a Slovin's formula.

$$n = \frac{N}{1 + N(e)^2} = \frac{1250}{1 + (1250 * (0.05^2))} = 303$$

Where: n = no. of samples; N = total population; and e = error margin / margin of error (0.05)

The computed sample size was 303, but to ensure equal representation across the five departments, the sample size was adjusted to 305, making it divisible by 5. The study made use of stratified random sampling in the selection of a sample size of 305 heads of departments. In this study, the strata comprised heads of departments from procurement, finance, operations, quality assurance, and marketing departments in agricultural firms in Kiambu County.

Table 1: Sample Size Distribution

Managers	Target Population	Sample Size
Procurement	250	61
Finance	250	61
Operations	250	61
Marketing	250	61
Quality Assurance	250	61
Total	**1250**	**305**

The study used primary data collected through semi-structured questionnaires comprising closed-ended and open-ended questions. Closed-ended questions included nominal scales for demographic information and a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5) to measure the study variables, while open-ended questions captured respondents' views, experiences, and suggestions in their own words. A pilot study was conducted among 31 heads of departments (10% of the intended sample) from agricultural firms in Murang'a County to assess the feasibility, validity, and reliability of the research instrument before the main study (Kothari, 2023). Face and content validity were assessed through pilot testing and expert reviews, while construct validity was evaluated using Confirmatory Factor Analysis (CFA). The results indicated satisfactory Average Variance Extracted (AVE) values of 0.877 for environmental considerations and 0.866 for performance of agricultural firms, exceeding the recommended threshold of 0.5. Reliability was assessed using Cronbach's alpha, with environmental considerations recording 0.867 and performance of agricultural firms 0.903,

both exceeding the acceptable threshold of 0.7. These findings demonstrated that the questionnaire had adequate validity and internal consistency for the main study.

The research instruments generated both qualitative and quantitative data. Thematic analysis was used to analyze qualitative data from open-ended questions. Quantitative data was analyzed by use descriptive and inferential analysis with the help of Statistical Package for Social Sciences (SPSS version 28), a statistical software. In this study, descriptive statistics included frequencies, percentages, mean and standard deviation. Inferential statistics included correlation analysis and regression analysis. Pearson correlation analysis was used to measure the strength and direction of the linear relationship between two continuous variables, helping to determine whether changes in one variable are associated with changes in another. Linear regression analysis was used to examine the cause-and-effect relationship between an independent variables and a dependent variable, allowing the researcher to predict the value of the dependent variable based on changes in the independent variable(s) and assess the magnitude of their influence. The regression model was as follows;

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

Whereby; Y = Organizational Performance; B_0 = Constant; β_1 =Coefficients of determination; X_1 = Environmental Considerations; ε = Error term

RESEARCH FINDINGS AND DISCUSSIONS

The target population of the study comprised 1,250 procurement, finance, and operations managers drawn from 200 agricultural firms in Kiambu County, Kenya. The response rate obtained from the administered questionnaires is presented in Table 4.1. The researcher distributed 305 questionnaires, out of which 279 were successfully completed and returned, yielding a response rate of 91.48%. According to Pallant (2020), a response rate of 50% is sufficient for effective analysis and reporting, a response rate of 60% is good while a response rate of 70% is regarded as excellent. This implies that the response rate (91.48%) in this study was within acceptable limits for drawing conclusions and making recommendations.

Table 2: Response Rate

Managers	Sample Size	Response	Response Rate
Procurement	61	58	95.08
Finance	61	57	93.44
Operations	61	56	91.80
Marketing	61	53	86.89
Quality Assurance	61	55	90.16
Total	**305**	**279**	**91.48**

Environmental Considerations

Participants were requested to indicate their level of agreement with a series of statements addressing different aspects of environmental considerations within their organizations. As shown in Table 3, the respondents agreed with a mean of 4.143(Std. dev=0.870) that efforts to reduce carbon emissions have improved the efficiency of our operations. Also, with a mean of 4.136(Std. dev=0.846) the respondents indicated that audit results are effectively used to enhance organizational performance. In addition, the respondents agreed with a mean of 4.115(Std. dev=0.716) that monitoring and managing carbon footprint contributes to cost savings and better resource utilization. With a mean of 4.090(Std. dev=0.867) the respondents agreed that integrating environmental audits into planning contributes to better decision-making and efficiency.

In addition, with a mean of 3.996(Std. dev=0.946) the respondents agreed that using eco-friendly products has improved operational efficiency. The respondents also agreed with a mean of 3.979(Std. dev=0.799) indicating that eco-friendly products enhance the firm's reputation among customers and stakeholders. The respondents agreed with a mean of 3.971(Std. dev=0.813) indicating that adhering to environmental laws reduces operational risks and improves performance. Further, the respondents agreed with a mean of 3.964(Std. dev=0.678) that reducing environmental impact enhances sustainability and long-term performance.

Also, with a mean of 3.936(Std. dev=0.807) the respondents agreed that compliance with environmental regulations strengthens credibility and market position. With a mean of 3.921(Std. dev=0.745) the respondents agreed that regular training on environmental compliance enhances staff effectiveness in achieving organizational goals. Similarly, with a mean of 3.914(Std. dev=0.925) the respondents agreed that conducting regular environmental audits helps improve operational processes. The respondents also agreed with a mean of 3.875(Std. dev=0.879) indicating that adoption of sustainable materials contributes positively to productivity.

Table 3: Environmental Considerations

	Mean	Std. Deviation
Using eco-friendly products has improved our firm's operational efficiency.	3.996	.946
Adoption of sustainable materials contributes positively to our firm's productivity.	3.875	.879
Eco-friendly products enhance our firm's reputation among customers and stakeholders.	3.979	.799
Compliance with environmental regulations strengthens our firm's credibility and market position.	3.936	.807
Adhering to environmental laws reduces operational risks and improves performance.	3.971	.813
Regular training on environmental compliance enhances staff effectiveness in achieving organizational goals.	3.921	.745
Efforts to reduce carbon emissions have improved the efficiency of our operations.	4.143	.870
Monitoring and managing carbon footprint contributes to cost savings and better resource utilization.	4.115	.716
Reducing environmental impact enhances our firm's sustainability and long-term performance.	3.964	.678
Conducting regular environmental audits helps improve our firm's operational processes	3.914	.925
Audit results are effectively used to enhance organizational performance	4.136	.846
Integrating environmental audits into planning contributes to better decision-making and efficiency	4.090	.867

The respondents were asked to indicate how else environmental practices influence the performance of agricultural firms in Kiambu County. From the findings, the respondents indicated that environmental practices improve soil fertility and long-term productivity through sustainable farming methods such as soil conservation and proper waste management. They also indicated that efficient use of resources such as water, energy, and farm inputs reduces operational costs and enhances profitability. The respondents further indicated that compliance

with environmental standards improves access to premium and export markets, as buyers increasingly prefer sustainably produced agricultural products. The respondents also indicated that strong environmental practices enhance the reputation and competitiveness of agricultural firms, making them more attractive to customers and business partners. They also indicated that environmental practices help firms attract funding opportunities and partnerships from institutions that prioritize sustainability. Further, the respondents indicated that adherence to environmental practices reduces exposure to environmental risks such as drought effects and regulatory penalties, thereby improving overall firm resilience and performance.

Organizational Performance

The respondents were requested to indicate their level of agreement with various statements relating to measures of organizational performance within their institutions. From the results, as shown in Table 4, the respondents agreed with a mean of 4.502(Std. dev=0.897) that quality management practices have improved customer satisfaction and loyalty. Also with a mean of 4.459(Std. dev=0.896) the respondents agreed that efficient resource utilization improves the overall performance of operations. In addition, the respondents agreed with a mean of 4.412(Std. dev=0.948) that profitability has increased as a result of efficient operational and strategic decisions. With a mean of 4.341(Std. dev=0.680) the respondents agreed that streamlined production processes contribute to timely delivery and customer satisfaction.

Similarly, with a mean of 4.183(Std. dev=0.959) the respondents agreed that effective management practices contribute to improved financial performance. The respondents also agreed with a mean of 4.176(Std. dev=0.792) that the firm has been able to increase its market share over the past few years. Further, the respondents agreed with a mean of 4.158(Std. dev=0.867) that strategic decisions and innovation have contributed to expanding market presence. Also with a mean of 4.079(Std. dev=0.805) the respondents agreed that the firm has consistently achieved its profitability targets in recent years.

In addition, the respondents agreed with a mean of 4.014(Std. dev=0.982) that the organization maintains high standards of quality in its products. The respondents agreed with a mean of 4.004(Std. dev=0.987) that maintaining competitiveness in the market improves overall organizational performance. Similarly, with a mean of 3.996(Std. dev=0.946) the respondents agreed that consistently delivering high-quality products positively impacts organizational performance. Moreover, with a mean of 3.971(Std. dev=0.959) the respondents agreed that the firm optimizes production processes to minimize waste and maximize output.

Table 4: Organizational Performance

	N	Mean	Std. Deviation
Our firm has consistently achieved its profitability targets in recent years.	279	4.079	.805
Effective management practices contribute to improved financial performance.	279	4.183	.959
Profitability has increased as a result of efficient operational and strategic decisions.	279	4.412	.948
Our firm optimizes production processes to minimize waste and maximize output.	279	3.971	.959
Efficient resource utilization improves the overall performance of our operations.	279	4.459	.896

Streamlined production processes contribute to timely delivery and customer satisfaction.	279	4.341	.680
The organization maintains high standards of quality in its products.	279	4.014	.982
Quality management practices have improved customer satisfaction and loyalty.	279	4.502	.897
Consistently delivering high-quality products positively impacts organizational performance.	279	3.996	.946
Our firm has been able to increase its market share over the past few years.	279	4.176	.792
Strategic decisions and innovation have contributed to expanding our market presence.	279	4.158	.867
Maintaining competitiveness in the market improves overall organizational performance.	279	4.004	.987

Correlation Analysis

The Pearson product-moment correlation coefficient was used to examine the strength and direction of relationships between the independent variable and the dependent variable. From the results, as presented in Table 4.9, environmental considerations had a strong and positive relationship with the performance of agricultural firms in Kiambu County, Kenya (r = 0.835, p-value = 0.000). Since the p-value is below the 0.05 significance level, the relationship is statistically significant.

Table 4. 1: Correlation Coefficients

Variable	Statistic	Performance	Environmental Considerations
Performance	Pearson Correlation	1	
	Sig. (2-tailed)	–	
	N	279	
Environmental Considerations	Pearson Correlation	.835**	1
	Sig. (2-tailed)	.000	–
	N	279	279

Regression Analysis

Linear regression analysis was conducted to examine the influence of environmental considerations on the performance of agricultural firms in Kiambu County, Kenya. As presented in Table 4.10, the model produced an R-squared value of 0.335, indicating that environmental considerations explained 33.5% of the variation in the performance of agricultural firms. The remaining 66.5% of the variation was attributable to other factors not included in the model. The adjusted R-squared value of 0.324 further indicates that environmental considerations explained 32.4% of the variation in firm performance after adjusting for the number of predictors in the model.

Table 4. 2: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.579[a]	0.335	0.324	0.2399

a. Predictors: (Constant), Environmental Considerations

ANOVA was performed to determine whether the regression model was statistically significant in explaining the relationship between environmental considerations and the performance of

agricultural firms in Kiambu County, Kenya. As presented in Table 4.11, the model produced an F-value of 382.654, with a significance level of 0.000 ($p < 0.001$), which is below the 0.05 threshold. This indicates that the regression model was statistically significant and adequately fitted the data. Therefore, environmental considerations had a statistically significant influence on the performance of agricultural firms in Kiambu County, Kenya.

Table 4. 3: Analysis of Variance

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	57.602	1	57.602	382.654	.000[b]
Residual	41.246	274	0.151		
Total	98.848	275			

a. Dependent Variable: Performance

b. Predictors: (Constant), Environmental Considerations

Regression equation for the unstandardized coefficients was:

$Y = 0.591 + 0.473X_1$

The study found that environmental considerations have a positive and significant influence on the performance of agricultural firms in Kiambu County, Kenya ($\beta_1 = 0.473$, p-value = 0.004). Since the p-value (0.032) is below the 0.05 significance level, the relationship is considered statistically significant. This suggests that a unit increase in environmental considerations leads to a 0.261 unit improvement in firm performance.

Table 4. 4: Regression Coefficients

	Unstandardized Coefficients		Standardized Coefficients		
Model	**B**	**Std. Error**	**Beta**	**t**	**Sig.**
1(Constant)	.591	.066		8.924	.000
Environmental Considerations	.473	.126	.413	3.754	.004

a. Dependent Variable: Performance

Discussion of the Findings

The findings established that environmental considerations were positively associated with the performance of agricultural firms in Kiambu County, Kenya. Descriptive results showed that respondents generally agreed that environmentally responsible practices improve operational efficiency, resource utilization, cost savings, regulatory compliance, and organizational reputation. In particular, reducing carbon emissions, effectively using environmental audit results, and monitoring carbon footprints emerged as important practices. Respondents further indicated that sustainable soil management, proper waste disposal, and efficient utilization of water, energy, and farm inputs enhance productivity and profitability. These findings are consistent with Kanagaraj et al. (2024), who linked emission reduction initiatives to operational effectiveness, and Pham (2024), who associated eco-friendly products with improved organizational reputation. They also support Umanah and Sado (2025), who observed that sustainable materials contribute positively to productivity.

Inferential findings further confirmed the importance of environmental considerations in explaining agricultural firm performance. Pearson correlation analysis revealed a strong, positive, and statistically significant relationship between environmental considerations and firm performance. Regression analysis established that environmental considerations explained a substantial proportion of the variation in firm performance. The regression coefficient was also positive and statistically significant, indicating that improvements in environmental

considerations were associated with improved firm performance. These findings agree with Solanke (2025) and Mdasha, Kariuki, and Wanjohi (2023), who reported positive relationships between environmental sustainability practices and organizational performance. The findings therefore demonstrate that integrating environmental considerations into agricultural firms' operations can strengthen resource efficiency, competitiveness, and overall performance.

Conclusions and Recommendations

The study concludes that environmental considerations have a positive and statistically significant influence on the performance of agricultural firms in Kiambu County, Kenya. Specifically, the findings established that the adoption of eco-friendly products, compliance with environmental regulations, effective carbon footprint management, and regular environmental audits are important practices associated with improved firm performance. These practices enhance operational efficiency, promote responsible resource utilization, reduce operational costs and environmental risks, and strengthen organizational reputation and competitiveness. The study further concludes that integrating environmental considerations into organizational operations contributes to improved productivity, profitability, and long-term sustainability. Therefore, agricultural firms that strengthen their environmental practices are more likely to achieve better performance and maintain a competitive position in the agricultural sector.

The study found that environmental considerations have a positive and significant influence on the performance of agricultural firms in Kiambu County, Kenya. Therefore, the study recommends that the management of agricultural firms should strengthen the implementation of environmental sustainability practices by prioritizing carbon emission reduction initiatives to enhance operational efficiency. Firms should institutionalize the use of environmental audits in planning and decision-making processes to improve efficiency and performance outcomes. In addition, management should ensure effective utilization of audit results to continuously enhance organizational performance. The firms should also invest in eco-friendly products and sustainable materials to improve operational efficiency, strengthen corporate reputation, and enhance stakeholder trust. Further, strict adherence to environmental regulations should be enforced, supported by continuous staff training on environmental compliance to enhance effectiveness, reduce risks, and promote long-term sustainability.

Areas for Further Research

The study sought to examine the influence of environmental considerations on the performance of agricultural firms in Kiambu County, Kenya. Since the study was geographically limited to agricultural firms in Kiambu County, its findings may not be generalizable to agricultural firms in other counties. Therefore, further studies should examine the influence of environmental considerations on the performance of agricultural firms in other counties in Kenya to establish whether similar findings can be obtained in different geographical and operational contexts. The study further established that environmental considerations explained 33.5% of the variation in the performance of agricultural firms, leaving 66.5% unexplained. Therefore, future research should investigate other organizational, operational, technological, and market-related factors that may influence the performance of agricultural firms in Kiambu County, Kenya.

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