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RESOURCE PROCUREMENT AND CLIMATE SMART AGRICULTURE IN LAIKIPIA COUNTY, KENYA

George Gatere Ruheni[A], Charles Mallans Rambo[B], Charles Misiko Wafula[C], Mary Nyawira Mwenda[D]

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ABSTRACT

Objective: The objective of this study is to determine how resource procurement influences climate-smart agriculture projects in Laikipia County, Kenya.

Theoretical Framework: This study is anchored on Transaction Cost Economics Theory, which states that a project will attract transaction costs all through the procurement process. This study anchors on this theory as small-scale farmers need to be innovative to reduce procurement costs and have bargaining power over exploitive stockists.

Method: A concurrent mixed method approach that adopted the descriptive cross-sectional survey and correlational design was employed to study two World Bank-sponsored Kenya Climate Smart Agriculture projects. Stratified and Simple random sampling were employed to get a sample of 225 small-scale farmers and purposeful sampling identified four key informants. Data was collected using questionnaires and an interview guide and analyzed using descriptive, inferential, and content data analysis techniques.

Results and Discussion: The composite mean and standard deviation of 3.25 and 1.163 respectively. The relationship between resource procurement and the performance of climate-smart agriculture projects had a fairly strong linear coefficient of correlation ($r= 0.524$) and p-value of ($p=0.000<0.05$) indicating a fairly strong and significant relationship. Therefore, effective procurement of inputs, machinery, and other resources is critical in sustainable agriculture.

Research Implications: Consequently, it is critical to have policies that promote effective procurement and safeguard small-scale farmers from exploitive stockists.

Originality/Value: This study contributes to the literature by providing reliable and triangulated empirical data through authentic methodology enhancing suitability for data generalisability and replicability. The relevance and value of this research is evidenced by the need to promote food security in a healthy ecology

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[A] *PhD Candidate in Project Planning and Management. University of Nairobi. Nairobi, Kenya.*
E-mail: ggruheni@gmail.com Orcid: https://orcid.org/0000-0003-3702-6848
[B] *PhD in Financing Distance Education. University of Nairobi. Nairobi, Kenya.*
E-mail: crambo@uonbi.ac.ke Orcid: https://orcid.org/0009-0005-9045-4261
[C] *PhD in Finance and Accounting. Accra University. Nairobi, Kenya.*
E-mail: charles.misiko@uonbi.ac.ke Orcid: https://orcid.org/0000-0003-0602-2879
[D] *PhD in Project Planning and Management. University of Nairobi. Nairobi, Kenya.*
E-mail: mmwenda@uonbi.ac.ke Orcid: https://orcid.org/0000-0002-5328-6431

AQUISIÇÃO DE RECURSOS E AGRICULTURA CLIMATICAMENTE INTELIGENTE NO CONDADO DE LAIKIPIA, QUÊNIA

RESUMO

Objetivo: O objetivo deste estudo é determinar como a aquisição de recursos influencia os projetos agrícolas inteligentes em relação ao clima no Condado de Laikipia, Quênia.

Estrutura Teórica: Este estudo está ancorado na Teoria Econômica dos Custos de Transação, que afirma que um projeto atrairá custos de transação durante todo o processo de aquisição. Este estudo se baseia nessa teoria, pois os pequenos agricultores precisam ser inovadores para reduzir os custos de aquisição e ter poder de barganha sobre os estoquistas exploradores.

Método: Uma abordagem de método misto simultâneo que adotou a pesquisa descritiva transversal e o projeto correlacional foi empregada para estudar dois projetos de agricultura inteligente climática do Quênia patrocinados pelo Banco Mundial. A amostragem aleatória estratificada e simples foi empregada para obter uma amostra de 225 pequenos agricultores e a amostragem intencional identificou quatro informantes-chave. Os dados foram coletados por meio de questionários e um guia de entrevista e analisados por meio de técnicas descritivas, inferenciais e de análise de dados de conteúdo.

Resultados e Discussão: A média composta e o desvio padrão foram de 3,25 e 1,163, respectivamente. A relação entre a aquisição de recursos e o desempenho de projetos agrícolas inteligentes em relação ao clima teve um coeficiente de correlação linear bastante forte (r= 0,524) e um valor de p (p=0,000<0,05), indicando uma relação bastante forte e significativa. Portanto, a aquisição eficaz de insumos, maquinário e outros recursos é fundamental para a agricultura sustentável.

Implicações da Pesquisa: Consequentemente, é fundamental ter políticas que promovam a aquisição eficaz e protejam os pequenos agricultores de estoquistas exploradores.

Originalidade/Valor: Este estudo contribui para a literatura ao fornecer dados empíricos confiáveis e triangulados por meio de uma metodologia autêntica que aumenta a adequação para a generalização e replicabilidade dos dados. A relevância e o valor desta pesquisa são evidenciados pela necessidade de promover a segurança alimentar em uma ecologia saudável

Palavras-chave: Projetos de Agricultura Inteligente para o Clima, Planejamento de Capacidade, Projetos Agrícolas, Pequenos Agricultores, Ecologia Saudável.

OBTENCIÓN DE RECURSOS Y AGRICULTURA CLIMÁTICAMENTE INTELIGENTE EN EL CONDADO DE LAIKIPIA, KENIA

RESUMEN

Objetivo: El objetivo de este estudio es determinar cómo influye la obtención de recursos en los proyectos de agricultura climáticamente inteligente en el condado de Laikipia, Kenia.

Marco Teórico: Este estudio se basa en la teoría de la economía de los costes de transacción, según la cual un proyecto genera costes de transacción durante todo el proceso de adquisición. Este estudio se basa en esta teoría, ya que los pequeños agricultores necesitan ser innovadores para reducir los costes de adquisición y tener poder de negociación sobre los almacenistas explotadores.

Método: Para estudiar dos proyectos de agricultura climáticamente inteligente en Kenia patrocinados por el Banco Mundial se empleó un método mixto concurrente que adoptó el diseño de encuesta transversal descriptiva y correlacional. Se emplearon el muestreo aleatorio estratificado y el muestreo aleatorio simple para obtener una muestra de 225 pequeños agricultores, y el muestreo intencional permitió identificar a cuatro informantes clave. Los datos se recogieron mediante cuestionarios y una guía de entrevista, y se analizaron utilizando técnicas de análisis de datos descriptivos, inferenciales y de contenido.

Resultados y Discusión: La media compuesta y la desviación típica de 3,25 y 1,163, respectivamente. La relación entre la adquisición de recursos y el rendimiento de los proyectos de agricultura climáticamente inteligente tenía un coeficiente lineal de correlación bastante fuerte (r= 0,524) y un valor p de (p=0,000<0,05) que indicaba una relación bastante fuerte y significativa. Por lo tanto, la adquisición eficaz de insumos, maquinaria y otros recursos es fundamental en la agricultura sostenible.

Implicaciones de la Investigación: En consecuencia, es fundamental contar con políticas que promuevan la adquisición efectiva y salvaguarden a los pequeños agricultores de los almacenistas explotadores.

Originalidad/Valor: Este estudio contribuye a la bibliografía al proporcionar datos empíricos fiables y triangulados mediante una metodología auténtica que mejora la idoneidad para la generalizabilidad y replicabilidad de los datos. La pertinencia y el valor de esta investigación se ponen de manifiesto en la necesidad de promover la seguridad alimentaria en una ecología sana.

Palabras clave: Proyectos de Agricultura Climáticamente Inteligente, Planificación de Capacidades, Proyectos Agrícolas, Pequeños Agricultores, Ecología Saludable.

1 INTRODUCTION

Prudence in the procurement of resources ensures the timely availability of the resources at minimal cost. In developed countries, the state champions food security projects by transparently procuring complex projects by adhering to set policies. However, in African countries, external forces have influenced the procurement of resources. In the pre-colonial and colonial eras, the interests of traders and colonialists were the major drivers (Bjornlund et al., 2020). Nonetheless, after independence, public participation and involvement of the private sector have enhanced transparency in resource procurement. Government policies would facilitate the process and intervene in costs through subsidies, social services, and agricultural land and water.

Arable land and water are critical resources in food security projects. To promote transparency in land procurement the Land Control Act Chapter 302, controls transactions of agricultural land (GOK., 2010), while the Water Act 2016 forms agencies that manage water resources (Dirwai et al., 2021). However, frail rural-urban planning and lack of sufficient public participation have led to compromised procurement of land and water resources, as self-interest overrides the principles and intent of the law. Hence, exposing the procurement of water and land to vulnerability of conflict of interest. Therefore, unless there is judiciously established procurement of the resources, then the resources may not yield the expected outcome.

Procurement in agricultural projects is a global challenge, in Bangladesh out of the 168 agriculture government is undertaking, 80% of these projects had cost overrun due to delays, poor procurement planning, and force de majeure (Khan et al., 2022). In Uruguay procurement favored dominant large-scale and influential agri-food industries, disadvantaging the subsistent farmers (Gaitán-Cremaschi et al., 2022). However, the United States of America is exceptional as it procured and implemented to completion a project that improved the efficaciousness of food security projects' resilience and productivity to $6.1 billion within the expected time (Lewis & Rudnick, 2019).

Unfortunately, in Kenya, the Galana-Kulalu food security project launched in 2014 with an estimated cost for construction and testing at Ksh14.5 billion and intended to be completed by the year 2022 was only 0.5% complete by the year 2019 (Leshore & Minja, 2019). Kenya

Climate Smart Agriculture Projects in Laikipia and other counties, procurement of resources is a challenge among the vulnerable and marginalized groups due to lack of finances and means to get credit. However, leveraging locally available manure, compost and cheaply available labor lessen the procurement burden (Kamau et al., 2019).

2 THEORETICAL FRAMEWORK

The proponent of the Transaction Cost Economics Theory was Coase in the year 1937 (Coase, 1937). The theory states that a project will attract transaction costs in the entire procurement process. This complicates and makes procurement distinct from the traditional purchase of goods and services. In procurement costs are attracted when identifying the required resources and selecting the vendors or suppliers, making requests for the supply, negotiating for better prices, making payments, ensuring what is requested is delivered, making payments, and keeping records (Amarasuriya, 2018). In most cases, the projects bear the brunt of the process costs, while suppliers maximizes the profits.

This study anchors on this theory as small-scale farmers suffer the most as stockists have a higher bargaining power. Hence, there is need for small-scale farmers to be innovative to reduce the cost of procurement so that their revenue is not in jeopardy. One of the judicious methods is to form cooperative societies so that the farmers might leverage the benefits of economies of scale. Consequently, heighten their bargaining power, share the transaction cost burdens, and insist on quality. Otherwise, in a competitive market, small-scale farmers' projects may suffer in the hands of scrupulous traders.

3 EMPERICAL LITERATURE

Pragmatic procurement of limited resources requires prudence in identifying their accessibility, cost reduction, cost avoidance, compliance with the standards, and minimizing lead time. In addition, the imbalance between procurement values on the one hand, and agricultural objectives on the other hand requires balancing to ensure expected financial and social returns (FAO, 2021). Moreover, information accessibility and bargaining power are critical aspects of procurement. Appiah et al. (2016) found that limited finances deprived the capacity of small-scale farmers to procure technology, farm inputs, and equipment. The Quasi-experiment design differentiated the study from this study.

In addition, the concentration of power in the agricultural market system determines the location of competitiveness (Sheldon, 2016). However, in most cases, small-scale farmers are disadvantaged unless they are in cooperatives, for them to leverage the cost benefits of mass sales and purchases. Also, despite the developed mobile applications that support the farm output market, none supported access to inputs, hence, the input market information asymmetry and inefficiency disadvantaged the farmers in procurement (Birch, 2018). Whether accidental or by design, these factors among others disadvantage farmers in the procurement of farm inputs.

Nonetheless, though not conclusive, the findings and the picture some scholars paint, highlight that farmers are underprivileged by design. In sub-Saharan Africa, traders and colonialists procured social services in areas where they would get returns from food security projects. However, they procured resources through forceful eviction of the local bona fide occupants. In Kenya, Sudan, Ethiopia, Mozambique, and Zambia traders and colonialists focused on the Great Rift Valley, depriving the locals of their resources for 4,000 years (Bjornlund et al., 2020). The traders and colonialists extracted resources including forceful labour and raw materials for their factories. (Bjornlund et al., 2020). This concept left the local farmers impoverished and lacking demand for superior inputs.

The post-colonial era maintained a status quo, as governments procured social services in areas where people had settled in large numbers, neglecting the rural areas. In addition, the government's focus diverted from cash crops to food crops that fed the urban and rural citizenry. Hence, urban bias is noticed in the procurement of social services (Bjornlund et al., 2020). In addition, agricultural economic development reinforced the dominance of foreign input companies (Bjornlund et al., 2020). Moreover, the input companies thrived on monopoly, Rutsaert et al. (2021) measured the geographical location of agro-product outlets. The study methodology was a survey, differentiating it from this study. However, the study found that dealers established a monopoly as they had low-choice products, hence, limiting competitiveness in the purchase of farm inputs. In addition, their outlets were geographically concentrated in areas, kilometers away from the farmers. Consequently, there is a need for small-scale farmers to form cooperatives to heighten their bargaining muscle.

Cooperatives are bound to promote farmers' interest in the market. In addition, the privatization of state corporations and the need to bridge budgetary deficits, transparency, and accountability are becoming fundamental in public procurement, more so in Kenya. The study by Xie et al. (2022) measured transparency and accountability in relief food procurement. Methodology differentiated the study from this study as the study employed case studies.

However, it found that public-private partnerships were critical in promoting transparency in procurement during the COVID-19 period when the government was procuring food in aid of the affected population. The study was supported by Ombasa and Kiruthu (2020) who measured public procurement of livestock-related products. The study methodology and concept were descriptive survey research design and focused on pastoralists respectively, differentiating it from this study. Moreover, the study found that multi-stakeholder participation in the County's public procurement in related livestock projects promoted transparency, monitoring, evaluation, and reporting. Nonetheless, lack of information, poverty, and the monopoly established by the huge multinational input firms continue to disadvantage farmers.

Information asymmetry and poverty continue to disadvantage farmers in procurement. Lack of information on the most suitable varieties, high input prices, and lack of money led farmers to go for inferior or inappropriate inputs (Langyintuo, 2020). Also, the poor smallholder farmers had access to land, but, could not afford the market price of inputs, hence, the government had to subsidize the inputs (Chirwa et al., 2015). Moreover, government intervention projects to improve the livelihood of farmers have not been conducted without challenges. In Laikipia County, public participation was neglected in the procurement and implementation of human and livestock food relief projects. A study by Muhua and Waweru (2017) measured the performance of food security based on preparedness and reaction to drought. The study methodology was descriptive research design and focused on physical access to food, which differentiated the study from this study. Moreover, the study found that lack of stakeholder involvement impaired planning, coordination, and effectiveness of the projects' procurement and impaired performance of food security projects. Hence, to a great extent, successive governments from the colonial error have not done enough to grant farmers an edge to conduct dignified procurement.

Laikipia County has had a dark history in resource procurement. The British settlers forcefully acquired the land from pastoralists, making Laikipia largely Crown Land. Moreover, with independence, the elites took the land and gave it to political cronies. The exercise disregarded the pastoralists, who were the initial landowners. The land-buying companies, cooperatives, and Government schemes such as Million Acre land, Shirika, and Haraka assisted small-scale farmers in acquiring land in the County (Gravesen & Kioko, 2019). Hence, the influx of smallholder farmers in Laikipia infringed on pastoral land. The phenomenon fueled persistent agro-pastoralist conflicts. However, the forceful acquisition of resources has been contradicted by the bidding process elucidated by the Kenya Climate Smart Agriculture projects

in Laikipia (County Government of Laikipia, 2019). Therefore, the Kariunga-Mutirithia-Naibor Dam water project and the Ndathimi Dam water project are transformative projects in resource procurement in the county.

4 MATERIALS AND METHOD

The main objective of this study was to examine whether resource procurement promotes climate-smart agriculture projects in Laikipia County, Kenya. The research question was, to what extent does resource procurement influence climate-smart agriculture projects in Laikipia County, Kenya? The concurrent multi-methodology approach was preferred to allow the collection of quantitative and qualitative data. Hence, the cross-sectional survey and correlational design were employed. This study unit of analysis was two World Bank-sponsored Climate Smart Agriculture dam projects, the Kariunga-Mutirithia-Naibor project (Segera Ward) with 300 small-scale farmers and the Ndathimi Dam project (Karaba ward), with 212 small-scale farmers respectively.

The study employed the Yamane (1967) formula to calculate the required sample size. Stratified and simple random sampling determined 130 small-scale farmers from the Kariunga-Mutirithia-Naibor dam water project and 91 small-scale farmers from the Ndathimi Dam water project. Also, four key informants purposefully sampled included the County Government, the Ministry of Agriculture, the Livestock and Fisheries officer, and the two project managers. The questionnaires assisted in soliciting information from 203 small-scale farmers. The interview guide prompted the researcher while collecting information from the four key informants, and the observation guide had questions that prompted the researcher to observe the projects.

5 RESULTS AND DISCUSSIONS

Resource procurement, the independent variable, and the performance of small-scale farmers' projects were assessed through various aspects, which included accountability in the procurement of resources, competitiveness by suppliers, consistency with the project suppliers, effectiveness of procurement, and value for money. Respondents were asked to indicate their opinion on a Likert scale weight of 1-5. Where: 1= strongly disagree, 2= disagree, 3= neutral, 4= agree, and 5 strongly agree. Table 1 highlights the results.

Table 1

Resource Procurement and Performance of Climate-Smart Agriculture Projects

Item	Statement	SD(1) F %	D(2) F %	N(3) F %	S(4) F %	SA(5) F %	TOTAL F %	M	SD
RP1	There is accountability in procurement of resources	34 (16.7%)	48 (23.6%)	36 (17.7%)	72 (35.5%)	13 (6.5%)	**203 100%**	**2.91**	**1.232**
RP2	Competitiveness by suppliers is considered during procurement.	25 (12.3%)	49 (24.1%)	41 (20.3%)	75 (36.9%)	13 (6.4%)	**203 100%**	**3.01**	**1.169**
RP3	There is consistence with the project suppliers	11 (5.4%)	24 (11.8%)	51 (25.1%)	72 (35.5%)	45 (22.2%)	**203 100%**	**3.57**	**1.121**
RP4	Procurement is conducted efficiently	23 (11.3%)	43 (21.2%)	41 (20.2%)	68 (33.5%)	28 (13.8%)	**203 100%**	**3.17**	**1.237**
RP5	Value for money is a factor in the procurement of resources.	8 (3.9%)	24 (11.8%)	55 (27.1%)	76 (37.4%)	40 (19.8%)	**203 100%**	**3.57**	**1.057**
Composite mean and composite Standard Deviation								**3.25**	**1.163**

Table 1 presents results for each line item measuring the degree to which resource procurement influenced the performance of Climate-Smart Agriculture Projects. A lower item mean compared to composite mean translates to a negative opinion on the tested item, while a lower standard deviation compared to the composite standard deviation translates to respondents' convergence in opinion.

Statement RP1, there was accountability in procurement of resources, 34(16.7%) strongly disagreed, 48(23.6%) disagreed, 36(17.7%) were neutral, 72(35.5%) agreed and 13(6.5%) strongly agreed, averaged to 2.91 versus 3.25 as composite mean, showed procurement of resources lacked accountability. Hence, supporting Rutsaert, Chamberlin, Oluoch, Kitoto, and Donovan (2021) who found that agro-dealers enshrined monopoly that obscured accountability. Item standard deviation of 1.232 versus 1.163 as composite standard deviation, implied divergent respondents' opinions. The findings support that from smallholders' perspective, procurement values and the agricultural objective conflicted leading to unexpected outcomes (FAO, 2021).

Statement RP2, competitiveness by suppliers was considered during procurement, 25(12.3%) strongly disagreed, 49(24.1%) disagreed, 41(20.3%) were neutral, 75(36.9%) agreed and 13(6.4%) strongly agreed, averaged to 3.01 versus 3.25 as composite mean, implied, competitiveness of suppliers involved in the procurement process for food security projects was not considered. Therefore, supporting that other factors took the front stage, such as the concentration of power in the agricultural market system determines the location of the

competitiveness (Sheldon, 2016). Hence, appreciating farmers lacked market power as compared to input distributors, farmers lacked competitiveness in the procurement of agricultural inputs. Item standard deviation of 1.169 versus 1.163, the composite standard deviation, meant that respondents' opinions were divergent. Hence, supporting Rutsaert et al. (2021) who found that agro-dealers had established a monopoly. Consequently, reducing the competitiveness of the farm inputs market.

Statement RP3, there was consistency with the project suppliers, 11(5.4%) strongly disagreed, 24(11.8%) disagreed, 51(25.1%) were neutral, 72(35.5%) agreed and 45(22.2%) strongly agreed, averaged to 3.57 versus 3.25 as composite mean, showing that food security projects' suppliers were consistent with their suppliers. This supported Rutsaert et al. (2021) who found that agro-dealers had established a monopoly, giving minimal options to farmers. The agro-dealers had achieved the monopoly by being located within clusters of geographically concentrated areas far away from farmers, also, they had low-choice products. A line standard deviation of 1.121 versus 1.163 as composite standard deviation of implied convergent respondents' opinions. The findings further supported that the agricultural economic development after colonialism reinforced the dominance of foreign input companies (Bjornlund et al., 2020). Hence, the farmers never stick to the same suppliers by choice, but for lack of alternatives due to the already established market systems.

Statement RP4, procurement was conducted efficiently, 23(11.3%) strongly disagreed, 43(21.2%) disagreed, 41(20.2%) were neutral, 68(33.5%) agreed and 28(13.8%) strongly agreed, averaged to 3.17 versus 3.25 as composite mean, revealed that efficiency was lacking in procurement processes. This supports Rutsaert et al. (2021) who found that the long distance from farmers to agro-products dealers indirectly increased input costs. Item standard deviation of 1.237 versus 1.163 as composite standard deviation indicated respondents' divergent opinions. The findings supported that despite the developed mobile applications that supported the farm out-put market, none supported access to inputs, hence, the input market information asymmetry and inefficiency disadvantaged the farmers in procurement (Birch, 2018).

Statement RP5, value for money was a factor in the procurement of resources, 8(3.9%) strongly disagreed, 24(11.8%) disagreed, 55(27.1%) were neutral, 76(37.4%) agreed and 40(19.8%) strongly agreed, averaged to 3.57 versus 3.25 as composite mean, implied that procurement of resources was prudently done to ensure value for money. This contrasted with Appiah et al. (2016) who found that lack of credit disadvantaged small-scale farmers from procuring technology, hence, lack of technology denied farmers efficacy in procurement. Item

standard deviation of 1.057 versus 1.163 as composite standard deviation indicated respondents' opinions were consistent. This supported smallholder farmers who could not afford the market price of inputs, hence, they had to opt for inferior inputs (Chirwa et al., 2015).

Various key informants had the following to say about the procurement of resources in the food security projects.

> Value for money and consistency with suppliers were the primary factors in procurement at the Kariunga-Mutirithia-Naibor Dam Project and Ndathimi Dam project. However, there was a monopoly by the already established enterprises and the government (Respondent A).
>
> Although there was value for money, the issue of accountability was a major hindrance in the procurement of resources in the project, hence wrangles in the projects. Accountability was not fully observed. (Respondent B)
>
> Consistency in suppliers was not out of choice, but due to the already established market system that was already established. (Respondent C).

The researcher observed a well-organized office, and though the filing system was manual, there was evidence of proper recording of transactions which was a pointer to accountability. The interview and the observation confirmed that consistency with suppliers and competitiveness in access to commodities injected efficacy in obtaining project resources.

5.1 CORRELATION ANALYSIS BETWEEN RESOURCE PROCUREMENT AND PERFORMANCE OF CLIMATE-SMART AGRICULTURE PROJECTS ANALYSIS

To examine resource procurement's relationship with the performance of Climate-Smart Agriculture Projects, Pearson's Correlation Coefficient was adopted to evaluate the association at a 0.05 level of significance. The values of correlational analysis range from negative one to positive one. Where positive one and negative one infer perfect-positive and perfect-negative correlation respectively, while zero implies no correlation. The modular values 0.001 to 0.250, 0.251 to 0.500, and 0.501 to 0.750 imply weak, moderately-strong and very strong correlations respectively. Table 2 details the correlation results.

Table 2

Correlation Analysis between Resource Procurement and Performance of Climate-Smart Agriculture Projects Correlations

Variables		Resource Procurement	Performance of Climate-Smart Agriculture Projects
Resource Procurement	Pearson Correlation	1	0.524**
	Sig. (2-tailed)		0.000
	n	203	203
Performance of Climate-Smart Agriculture Projects	Pearson Correlation	0.524**	1
	Sig. (2-tailed)	0.000	
	n	203	203

**Correlation was significant at 0.05 level of significant (2-tailed)

Table 2 details the correlation coefficient of (r= 0.524) with a p-value (p=0.000<0.05) for resource procurement and performance of Climate-Smart Agriculture Projects. Hence, the null hypothesis H0: resource procurement has no significant relationship with the performance of Climate-Smart Agriculture Projects was rejected. Therefore, there was an association between resource procurement and the performance of Climate-Smart Agriculture Projects. This supported Boulanger, Dudu, Ferrari, Mainar-Causapé, and Ramos (2022) who found that subsidies and access to inputs supported farmers' efficacy in the inputs procurement, to promote food production.

5.2 REGRESSION ANALYSIS OF RESOURCE PROCUREMENT AND PERFORMANCE OF CLIMATE-SMART AGRICULTURE PROJECTS

Demonstrating how resource procurement significantly predicted the performance of Climate-Smart Agriculture Projects was the justification for employing the simple regression model.

5.2.1 Regression Model

The statistical model was used to test the null hypothesis.

Performance of Climate-Smart Agriculture Projects = resource procurement

$$Y = \beta_0 + \beta_1 X_1 + \varepsilon \qquad (1)$$

where:

Y = Performance of Climate-Smart Agriculture Projects

X_1 = resource procurement

β_0 = Constant term

β_1 = Beta coefficient

ε = Error term

Table 3 presented the regression results.

Table 3

Regression Analysis on Resource Procurement and Performance of Small-scale Framers' Food Security Projects

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.524[a]	0.274	0.271	0.44614

ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig
1	Regression	15.129	1	15.129	76.007	0.000[b]
	Residual	55.136	201	0.199		
	Total	**55.136**	**202**			

Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.912	0.109		17.536	0.000
	Resource Allocation	0.280	0.032	0.524	8.718	0.000

Predictors: (constant), Resource Procurement
Dependent Variable: Performance of Climate-Smart Agriculture Projects

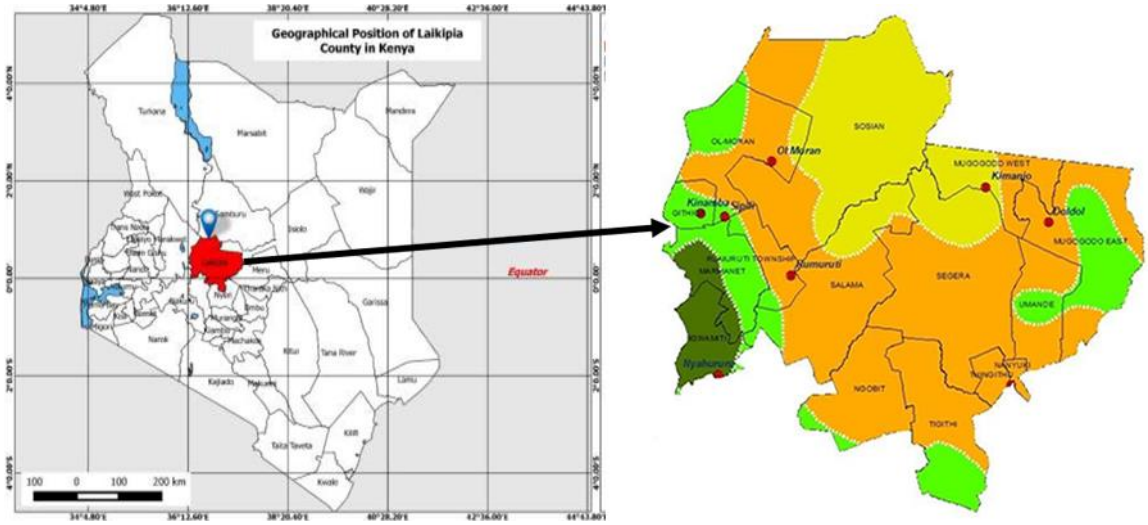
Table 3 presents the model summary, depicting a positive correlation coefficient r= 0.524, linking resource procurement and performance of Climate-Smart Agriculture Projects. The coefficient of determination R^2 = 0.274, translated to 27.4% of total variations in the performance of Climate-Smart Agriculture Projects was explained by resource procurement. The F statistics F (1,201) =76.007) was greater than the critical value (3.888) confirming the model's goodness of fit. The relationship was significant given a p-value (p= 0.000 < 0.05). This supports that policies such as entrenching subsidies and increasing market access to inputs are critical to support farmers' efficacy in the procurement of inputs, to promote food production (Boulanger et al., Ramos, 2022).

Table 3 presents the ANOVA results indicating that F statistics (1,201) = 76.007 was significant at P-value 0.002 < 0.05. This implied that the predictor coefficient was at minimum not equal to zero and the regression model allowed prediction of the performance of Climate-Smart Agriculture Projects by resource procurement. This supports the need to link small-scale farmers to the supply chains for their inputs to guarantee the performance of small-scale farming profitability (Bjornlund et al., 2020).

Table 3 results of simple linear regression suggested the consequential influence of resource procurement on the performance of Climate-Smart Agriculture Projects. The constant term's coefficient of (β_o =1.912; P < 0.05), and resource procurement (β_1 = 0.280, P-value 0.000 < 0.05) were statistically consequential. The accrued regression model was Y=1.912 + ($0.280X_1$), indicating a unit of performance of Climate-Smart Agriculture Projects was positively and linearly converted by 0.280 units of resource procurement. This supported Rutsaert et al. (2021), who found that small-scale farmers needed to form co-operatives to heighten their bargaining muscle for inputs against established monopolies.

Figure 1

Map of Kenya and Laikipia County where the study was conducted



Source: (GOK., 2017).

6 CONCLUSIONS

The need to enforce policies on water withdrawal from natural resources is critical. In addition, there is a need to have policies demanding water harvesting at national, county, project, and individual levels. This would make the land to be more productive. Also, there is a need for

policies that would promote access to farm inputs by farmers. In addition, farmers need to form cooperative societies to leverage the benefits of economies of scale and heighten their bargaining power. The marginalized and the vulnerable lack credit to procure agricultural resources and inputs. This limits the capacity of small-scale farmers to increase their agricultural production. Hence, capacity building is critical in promoting the procurement of resources. There is a need for the government to address historical injustices to facilitate accessibility and procurement of the available resources. In addition, the government needs to aid the procurement of resources through subsidies, regulated taxes, and making credit accessible to small-scale farmers. Consequently, increasing the cake that could be shared by all.

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