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Joint Effect of Monitoring and Evaluation Tools, Capacity Building, Stakeholder Participation on Performance of Agricultural Programs in Kenya

Peter Kamau Nduati [1], Stephen Wanyonyi Luketero [2], Johnbosco Mutuku Kisimbii [3], Mary Nyawira Mwenda[4],

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Abstract

The main objective of the study was to assess the joint effect of monitoring and evaluation tools, capacity building, and stakeholder participation on the performance of the Climate-Smart Agricultural Productivity Program in Kitui County, Kenya. Descriptive survey, cross-sectional, and correlational research designs were adopted for the study. The unit of analysis was five projects under the Climate-Smart Agricultural Productivity Program in Kitui County. The sample size was 260 respondents. Data were collected and analyzed using descriptive and inferential statistics. The results revealed that the overall regression model of the joint influence of monitoring and evaluation tools, capacity building, and stakeholder participation had high explanatory power. The coefficient of determination was $R = 0.841$, $R^2 = 0.707$, and adjusted $R^2 = 0.704$. That is, the joint effect of the study variables explained 70.4 percent of the changes in the performance of the Climate-Smart Agricultural Productivity Program in Kitui County; therefore, 29.6 percent of the changes in performance were explained by other variables not considered in this study.An ANOVA test was conducted, and the results indicated that the overall model was significant, since $F = 195.076$, $p = 0.000 < 0.05$. Therefore, the null hypothesis was rejected, meaning that there was a significant joint effect of M&E tools, capacity building, and stakeholder participation on the performance of the Climate-Smart Agricultural Productivity Program in Kitui County, Kenya.Regarding individual significance, the constant ($p = 0.811$) and stakeholder participation ($p = 0.603$) were not significant, since their p-values were greater than the 0.05 significance level. In contrast, monitoring and evaluation tools and capacity building were significant, because their p-values (0.000) were less than the 0.05 level of significance. In conclusion, and using the standardized coefficients, it is more prudent to enhance capacity building, as a one-unit change in it has, on

[1] PhD Candidate in Project Planning and Management, Department of Management Science and Project Planning. University of Nairobi, Nairobi, Kenya
peternduati954@gmail.com (Corresponding Author)
https://orcid.org/0009-0005-7220-105X
[2] Professor, Department of Mathematics. University of Nairobi, Nairobi, Kenya.
sluketero@uonbi.ac.ke
https://orcid.org/0000-0002-2142-4588
[3] Lecturer, Department of Finance and Accounting. University of Nairobi, Nairobi, Kenya.
jkisimbii@uonbi.ac.ke
https://orcid.org/0000-0003-0238-3503
[4] Lecturer, Department of Management Science and Project Planning. University of Nairobi, Nairobi, Kenya.
mmwenda@uonbi.ac.ke
https://orcid.org/0000-0002-5328-6431

average, more impact on the performance of the Climate-Smart Agricultural Productivity Program in Kitui County.

Keywords: Monitoring And Evaluation Tools, Capacity Building, Stakeholder Participation, Performance

I. Introduction

Monitoring and evaluation of agricultural projects operate under very dynamic environments, characterized by erratic weather conditions and advanced technology. Therefore, for projects to achieve their objectives, they require proper monitoring and evaluation tools capable of assisting in tracking their progress. Agricultural projects are utilized to address issues of poverty, unemployment, and poor health that are pervasive in rural areas in most developing nations (FAO, 2018; Karangwa, Ndabananiye, and Mutabazi, 2022). Monitoring and evaluation tools provide a mechanism to monitor the progress, outputs, results, and effects of interventions, allowing organizations to learn from their experiences, increase staff capacity, and make evidence-based adjustments to their strategies (Bamberger, Rugh, & Mabry, 2019). Studies have linked the use of monitoring and evaluation tools including Gantt charts, logical frameworks, and baseline surveys to project performance (Kithinji and Senelwa, 2018; Walubengo, 2019; Mwangi and Moronge, 2020). Amolo, Rambo, and Wafula (2021) state that capacity building has a substantial impact on how projects perform. Therefore, decision-makers and project managers should combine their monitoring and evaluation capabilities to enhance project performance. Furthermore, they should create new policies to strengthen capacity building in order to ensure project implementation success. In addition, Nnadi and Oyama (2023) argue that organizations should incorporate stakeholder input throughout the project, from inception to completion, to improve performance. Therefore, programs will function better and align more closely with their environments when they integrate critical aspects of monitoring and evaluation tools, capacity building, and stakeholder participation. The context of the study is the Climate-Smart Agricultural Productivity Program in Kitui County. Over time, the Kenyan government has taken steps to increase agricultural growth and prepare for the effects of climate change. These initiatives include the Kenya Climate-Smart Agriculture Implementation Framework Programme (2018–2027), the National Livestock Policy (2015), the Strategic Plan for Agricultural and Rural Statistics (2015–2022), and the Agricultural Sector Transformation and Growth Strategy (ASTGS) (2019–2029) (Amwata, 2020). The study was motivated by several convictions: First, the agricultural sector must grow consistently by more than 7% annually by 2030 in order to meet the goals of Kenya Vision 2030. Second, the industry must be profitable, commercially oriented, and competitive both regionally and globally. To achieve the envisaged growth in the sector, the development and use of scientifically proven technologies must be enhanced. The Agriculture Sector Transformation and Growth Strategy (ASTGS) for 2019–2029 outlines the vision for Kenya's agricultural sector (ASTGS, 2018; Amwata, 2020). Monitoring and evaluation of agricultural performance focus on achieving regional goals of poverty reduction, food security, and economic growth in Kenya, which calls for continued attention.

Aim and Originality of the Study

With increasing government focus on promoting agriculture for food and nutrition security, National Agriculture Research Systems (NARS) institutions require greater investment in innovative and beneficiary-focused approaches. The central focus of the study was performance, measured in terms of timely completion, realistic project duration, activity achievement, completion within budget, and beneficiary satisfaction critical indicators of the success of agricultural programs. Equally, the inputs to performance namely, monitoring and evaluation tools, capacity building, and stakeholder participation can be applied as management strategies. Organizations implementing projects should support their program managers in formulating tools that facilitate the full implementation of the monitoring and evaluation process. Continued investment in training related to project management and interpersonal relations for personnel is required. This will enhance their expertise and professionalism and lead to improved capacity to deliver. These measures will have a positive influence on agricultural programs. Policymakers will benefit from the outcomes of the current study in developing strategies to enhance the performance of agricultural programs. Sector policy formulation is supported by informed decisions based on implementers' experiences to guide agriculture-related development. Agriculture is an important driver of economic growth by creating employment and improving food security and nutrition. Furthermore, the study results inform policymakers of the importance of adopting monitoring and evaluation tools to improve the performance of agricultural programs. The conclusion that capacity building is the main factor influencing the performance of the Climate-Smart Agricultural Productivity Program and that monitoring and evaluation tools have a significant influence on that relationship will guide resource allocation by policymakers. Allocating larger proportions of budgetary resources to capacity building, as well as to physical and non-physical systems related to monitoring and evaluation, and to well-trained employees, will enhance the performance of

Climate-Smart Agricultural Productivity Programs. This, in turn, would enhance income-generating activities and the overall profitability of agricultural enterprises. National Agriculture Research Systems (NARS) bodies will use the results of the current study to strengthen support for national strategy formulation in the agricultural sector and promote its growth.

Research Problem

The agricultural sector plays a key part in Kenya's efforts to improve manufacturing and attain complete food security and nutrition. The sector also helps to achieve sustainable development. It contributes significantly to the economic and social development of the nation by generating wealth, creating jobs, earning foreign exchange, ensuring the security of land tenure, and managing and administering land sustainably (The National Treasury, 2022). Among the agricultural programs carried out in Kenya, some have demonstrated higher levels of effectiveness in comparison to others. It was, therefore, essential to empirically investigate whether these disparities could be traced to monitoring and evaluation tools, capacity building, and stakeholder participation, focusing on the Climate-Smart Agricultural Productivity Program. However, the empirical literature has been equivocal due to conflicting findings ranging from positive, neutral, to negative linkages, despite the fact that these characteristics are theoretically related to higher program performance. The divergence in the empirical review was attributed to conceptual, contextual, and methodological shortcomings. At the conceptual level, mixed findings were attributed to varied selection and operationalization of variables. Due to the divergent metrics used in previous empirical studies, there was no consistent definition of indicators for monitoring and evaluation tools, capacity building, stakeholder participation, or program performance. Additionally, some studies were twofold, focusing only on a single monitoring and evaluation tool and project performance. For instance, Khosrow (2010); Gupta (2013); Ong, Wang, and Zainon (2016); Sharon and Dori (2017); Leuzzi (2013); Oyola and Odhiambo (2018); Walubengo, Kyalo, and Mulwa (2019); Mwangi and Moronge (2020); Safari and Kisimbii (2020); and Njeru and Kirui (2022). This clearly brought out a conceptual gap, as no single study focused on Gantt charts, logical frameworks, and baseline surveys as monitoring and evaluation tools and how they affected project performance. Therefore, the study aimed to fill this gap.

Further, studies conducted by Sunindijo (2015); Mushori, Machira, and Matu (2020); Muriithi (2017); and Amolo, Rambo, and Wafula (2021) focused on capacity building as an independent variable affecting the performance of different projects. They did not examine the moderating effect of capacity building on the relationship between monitoring and evaluation tools and project performance, creating a conceptual gap, which was the focus of this study. Additionally, studies by Malik et al. (2023); Nnadi and Oyama (2023); Mugabo and Mulyungi (2019); and Moegi and Mutuku (2023) examined the effect of stakeholder participation as an independent variable on project performance. The literature revealed limited work on examining the intervening effect of stakeholder participation on project performance, thereby revealing a conceptual gap, which this study also aimed to address.

At the contextual level, mixed findings were traced to sectoral disparities and variations between projects. A study by Malik et al. (2023) examined the connections between stakeholder engagement, communication factors, and the success of renewable energy projects in Pakistan. Ngonda (2018) conducted a study in South Africa focusing on project management maturity and project managers' attributes. Sunindijo (2015) carried out a study in Australia focusing on project manager skills for improving project performance, while Muriithi, Ndung'u, and Kidombo (2021) conducted a study in Kenya focusing on self-help group projects. This strongly demonstrates that research has been conducted in several sectors, leading to contextual gaps. At the methodological level, inconsistent findings were attributed to the choice of research design, the type of data applied (cross-sectional vs. longitudinal), sampling differences, as well as varying study periods. For instance, Mwangi and Moronge (2020) adopted a descriptive research approach and used the census method. Semi-structured questionnaires were employed for data collection from the selected sample. Further, regression and correlation analyses were used to analyze the data. Malik et al. (2023) sampled the respondents using random and snowball sampling techniques and analyzed the data using the Structural Equation Modelling (SEM) method. Another study by Njeru and Kirui (2022) adopted descriptive and explanatory research designs; census was used to select the respondents, while structured questionnaires were employed to collect primary data. The data were analyzed using descriptive and inferential statistics. This presents divergence in the methodologies used by different authors, thereby revealing methodological gaps.

Since the relationship between monitoring and evaluation tools and project performance was largely understudied, the study investigated this linkage by incorporating capacity building and stakeholder participation, respectively. Due to the persistence of the identified gaps from the conceptual and contextual to the methodological the study sought to answer the following research question:

How do monitoring and evaluation tools, capacity building, and stakeholder participation jointly influence the performance of the Climate-Smart Agricultural Productivity Program in Kitui County, Kenya?

II. Literature Review and Development of Hypothesis

Theoretical Framework

The study was underpinned by three theories, namely: the Theory of Change, Systems Theory, and Interdependence Theory. The Theory of Change provided essential information on how the project should work. It offered a roadmap of where the project is heading, while monitoring and evaluation test and refine that roadmap (Bbosa, Edaku, and Kiyingi, 2023). Msila and Setlhako (2013) indicated that the Theory of Change provides a basis to demonstrate the intervention's impact. The Theory of Change was crucial for project implementers and stakeholders in gathering and utilizing relevant M&E tools, information, and lessons.

It was used to strengthen the relationship among M&E tools and to integrate them cohesively. However, this theory could not be applied to the stakeholder participation and capacity building variables, leading to the adoption of the Interdependence Theory.

The Interdependence Theory identifies a project as a collection of various activities composed of variables that depend on and interact with each other. Killen et al. (2009) indicated that this theory has been used to determine interdependencies in multi-project environments and organizational structures. Nzekwe, Oladejo, and Emoh (2015) revealed that projects have various interrelated elements.

Emprical Review

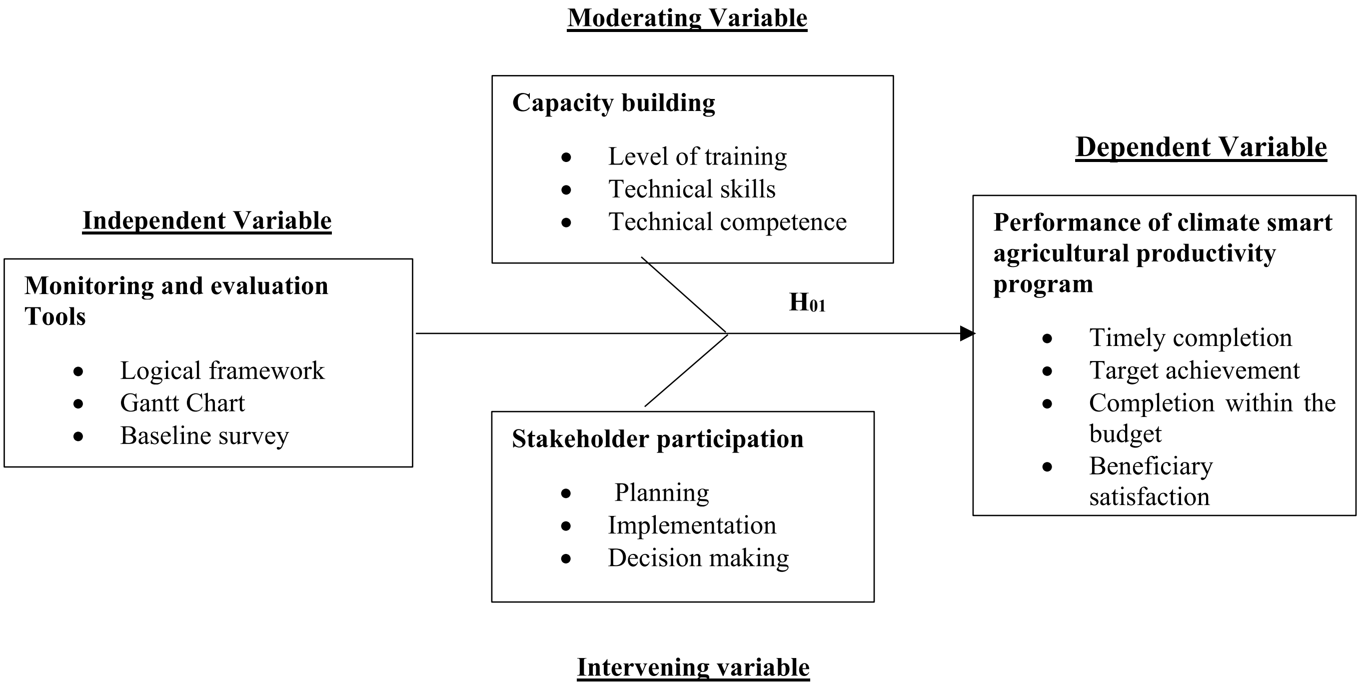
Sharon and Dori (2017) conducted a study to assess model-based project–product lifecycle management and Gantt chart models: a comparative study. The objective of the study was to compare Gantt charts and project product life management (PPLM). Being a comparative study, it adopted the case study methodology. Results indicated that understanding the details contained in the object process methodology based on the project product life management project plan is easier compared to the corresponding details displayed through the Gantt chart. Study outcomes indicate that PPLM is capable of clarifying the entangled relationships between project management (PM) and systems engineering (SE) used to develop project systems. It enables communication and understanding between project managers and systems engineers, thereby achieving project outcomes, improving performance, and enhancing decision-making. The study reveals a methodological gap, as it was a review of literature and therefore lacks empiricism.

Waithera and Wanyoike (2015) undertook a study to determine whether staff training has an impact on M&E execution. A descriptive survey design was used, whereby 50 respondents were chosen using a sampling technique called the census method. A structured questionnaire was employed for data collection, and both inferential and descriptive methods were used for data analysis. Findings showed that project M&E performance for the youth-funded agricultural initiatives was positively influenced by staff training. According to the study's findings, a brief course on M&E ought to be provided with the assistance of youth fund managers. The goal of the current study was to ascertain how capacity building affects agricultural projects. These studies present a conceptual gap, as they did not focus on examining the joint effect of monitoring and evaluation tools, capacity building, stakeholder participation, and the performance of the Climate-Smart Agricultural Productivity Program. Therefore, this study sought to address this gap.

Uddin, Ong, and Matous (2023) carried out a data-driven, network-based analysis of stakeholder engagement variability in public, private, and public–private partnership projects in Australia. This study used quantitative methods to compare and quantify these engagement structures using social network research techniques. Through an online survey, information about the stakeholder networks for 17 public, 30 private, and nine PPP projects was gathered. The data were then subjected to a number of network-based analyses, both at the level of specific project stakeholders and across entire project stakeholder ecologies. Across the three project types, there was a statistically significant difference in the network-level measurements of network size, edge number, density, and betweenness centralization. The results highlighted structural variations in stakeholder engagement patterns between the public and private spheres and demonstrated how network data and analytical techniques can be used to monitor and manage intricate webs of connections between individuals who have an impact on, and are affected by, various project types.

The literature reviewed revealed conceptual gaps, as it did not focus on the joint effect of monitoring and evaluation tools, capacity building, stakeholder participation, and project performance. Therefore, this study focused on examining the joint effect of monitoring and evaluation tools, capacity building, stakeholder participation, and the performance of the Climate-Smart Agricultural Productivity Program in Kitui County, Kenya.

Figure 1. Conceptual framework



The following research hypothesis for the study was tested at the 95 percent level of significance.

H_{01} M&E tools, capacity building, and stakeholder participation have no significant joint effect on performance of climate smart agricultural productivity program in Kitui County, Kenya**.**

III. Methodology

Research Design

Descriptive survey, cross-sectional, and correlational research designs were adopted for the study to allow the collection of both quantitative and qualitative data. The data collected were merged and analyzed to answer the research questions. Furthermore, the three designs provided complementarity, extension, completeness, and diversity in data collection, analysis, and interpretation. The descriptive survey design was used to describe data and the characteristics of the study phenomena. However, this design was limited in determining the cause of specific behaviors, occurrences, and motivations. The cross-sectional research design allowed for the collection of data on study variables from the population. The limitation of this design was that it could not establish cause-and-effect relationships. Thus, to measure two or more variables and the degree to which they relate to one another, a correlational research design was adopted.

Sampling

In the study, 38 project staff and the program coordinator were purposively selected. Purposive sampling was used to select these officers because they were knowledgeable about the subject area and possessed the required technical skills to address the research questions. The study employed simple random sampling to select beneficiary respondents from the five projects. Additionally, Yamane's (1967) formula was adopted to calculate the sample size of program beneficiaries, where n = sample size, N = target population, and ε = precision error (0.05). The calculated sample was 219, who were proportionately distributed. The total sample size was 260 respondents.

$$n = \frac{N}{1 + N(\varepsilon^2)}$$

$$n = \frac{484}{[1 + 484(0.05^2)]} = 219.21 \cong 219$$

Data Collection and Analysis

A combination of open- and close-ended questionnaires was used. The questionnaire was divided into Sections A and B. Section A collected demographic data, while Section B was used to collect data on the influence of monitoring and evaluation tools, capacity building, stakeholder participation, and the performance of the Climate-Smart Agricultural Productivity Program. This section contained question items within the following thematic areas: monitoring and evaluation tools, capacity building, stakeholder participation, and performance. A five-point Likert scale format was used to determine quantitative responses. It was selected because it yields equal intervals, a feature that allows for hypothesis testing.

Pilot Testing

Focused on assessing the instrument's validity, a pilot test was conducted whereby 27 respondents were proportionately drawn from the five projects under the Climate-Smart Agricultural Productivity Program in Kitui County. The selected respondents did not participate in the main study. Based on the testing, necessary adjustments were made to the questions to ensure they were clear and easy to understand.

Validity and Reliability of Research Instruments

In this study, the validity of the research instruments was determined during pretesting to refine the instrument. Before pretesting, expert and peer opinions were sought from colleagues to determine the suitability of the questions. Suggestions and recommendations provided were used to amend the questionnaire. A clear definition of the domains for assessing content knowledge and test validity was provided to ensure content validity. Furthermore, the supervisors' judgment was sought to determine content validity. Comments and recommendations from the university supervisors were used to improve the research instrument. Construct validity was used in the study to assess whether the tests measured what they were intended to measure. The supervisors were consulted to validate and operationalize the research activities. Finally, a statistical validity test was conducted by calculating the correlation between each question in the questionnaire and their total score. From the analysis, the significance values (Sig.) obtained were 0.000. The results confirmed that since Sig. < 0.05, the questionnaire was valid. Reliability in the study was ensured through methodological triangulation, which strengthened the investigation, as the study involved both qualitative and quantitative methods. A Likert-type questionnaire was used as the main instrument. It was essential to test internal consistency to determine whether the concepts were well aligned within the survey. Therefore, based on the results, Cronbach's alpha reliability coefficient was calculated for each variable: Monitoring and Evaluation Tools = 0.958, Capacity Building = 0.887, Stakeholder Participation = 0.927, and Performance of the Climate-Smart Agricultural Productivity Program = 0.858. The Cronbach's alpha values ranged from 0.858 to 0.958, while the overall coefficient was 0.906, which was deemed acceptable. All scale items exceeded the acceptable threshold of 0.7, indicating that the data were reliable and, therefore, retained for subsequent analysis.

Data analysis

The study employed inferential and descriptive statistical analysis to analyse data. Before analysing the responses, completed questionnaires was checked for consistency and completeness. The strength of the study variables was tested using correlation and regression model, as shown in the model below.

$$PCSAPP = \beta_0 + \beta_1 MET + \beta_2 CB + \beta_3 SP + \varepsilon$$

Results

This section presents finding of the study.

Descriptive Analyses of Study Variables

This section presents data analysis on the indicators of monitoring and evaluation tools, which was the independent variable in the study. The indicators are Gantt chart, logical framework and baseline survey. In the study, the following Likert scale was used for respondents indicate the extent to which they agreed with the statements in each of the indicators by using a scale of 1 to 5 whereby: 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5= Strongly Agree. Results are illustrated in Table 1.

Table 1. Monitoring and Evaluation Tools

Study Variable	Indicator	N	Mean (M)	Standard Deviation (S)	Coefficient of Variation (CV)
Monitoring and Evaluation Tools	Gantt Chart	246	4.39	0.69	0.16
	Logical framework	246	4.38	0.68	0.15
	Baseline survey	246	4.30	0.71	0.17
	Overall	**246**	**4.36**	**0.63**	**0.14**

Note: Author's own work

From the results, Gantt chart was rated high with a Mean score of 4.39, Standard Deviation of 0.69 and Coefficient of Variation was 0.16, indicating that majority of the respondents strongly agreed that Gantt chart is an important tool that influences performance of climate smart agricultural productivity program. Logical framework was rated high with [Mean=4.38, SD=0.68, CV=0.15] while baseline surveys [Mean=4.30, SD=0.71, CV=0.17]. The overall score [M=4.36, SD=0.63, CV=0.14] this implied that monitoring and evaluation tools are very important on performance of climate smart agricultural productivity program.

This section presents data analysis and on the indicators of capacity building which is the moderating variable in the study. The indicators are level of training, technical skills, and technical competence. In the study, the following Likert scale was used for respondents indicate the extent to which they agreed with the statements in each of the indicators by using a scale of 1 to 5 whereby: 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5= Strongly Agree. Results are illustrated in Table 2.

Table 2. Capacity Building

Study Variable	Indicator	N	Mean (M)	Standard Deviati (SD)	Coefficient of Variation (CV)
Capacity Building	Level of training	246	4.35	0.67	0.15
	Technical skills	246	4.23	0.70	0.16
	Technical competence	246	4.09	0.71	0.17
	verall	**246**	**4.24**	**0.61**	**0.14**

Note: Author's own work

The results revealed that level of training [M=4.35, SD=0.67, CV=0.15] was critical factor influencing performance of climate smart agricultural productivity program in Kitui County as it was rated high. Technical skills were rated high [M=4.23, SD=0.70, CV=0.16] and technical competence [M=4.09, SD=0.701, CV=0.17]. Overall, Capacity building was rated high [M=4.24, SD=0.61, CV=0.14] largely, it had a positive perception on performance of climate smart agricultural productivity program in Kitui County.

This section presents data analysis and on the indicators of stakeholder participation which was the intervening variable in the study. The indicators include planning, implementation, and decision-making. In the study, the following Likert scale was used for respondents indicate the extent to which they agreed with the statements in eachof the indicators by using a scale of 1 to 5 whereby: 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5= Strongly Agree. Results are illustrated in Table 3.

Table 3. Stakeholder Participation

Study Variable	Indicator	N	Mean (M)	tandard Deviati (SD)	Coefficient of Variation (CV)
Stakeholder Participation	Planning	246	4.14	0.71	0.17
	Implementation	246	4.23	0.67	0.16
	Decision making	246	4.11	0.69	0.17
	Overall	**246**	**4.16**	**0.62**	**0.15**

Note: Author's own work

The results indicate that majority of the respondents agreed that they were involved during implementation [M=4.23, SD=0.67, CV=0.16]. Further, respondents agreed that stakeholders were involved in planning [M=4.14, SD=0.71, CV=0.17]. Lastly, Decision making was rated lowest [M=4.11, SD=0.69, CV=0.17], indicating that respondents agreed they were involved in decision making but not as much as in implementation and planning. Overall stakeholder participation [M=4.16, SD=0.62, CV=0.15], had a strong perception on performance of climate smart agricultural productivity program in Kitui County.
This section presents data analysis and on the indicators of performance of climate smart agricultural productivity program which was the dependent variable in the study. The indicators were timely completion, realistic program period, activity achievement, completion within the budget, beneficiary satisfaction. In the study, the following Likert scale was used for respondents indicate the extent to which they agreed with the statements in each of the indicators by using a scale of 1 to 5 whereby; 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5= Strongly Agree. Results are illustrated in Table 4.

Table 4. Performance of Climate Smart Agricultural Productivity Program

Study Variable	Indicator	N	Mean (M)	Standard Deviatio (SD)	Coefficient of Variatio (CV)
Performance Of Climate Smart Agricultural Productivity Program	Timely completion	246	4.30	0.86	0.20
	Realistic program period	246	4.23	0.93	0.22
	Activity achievement	246	4.27	0.83	0.20
	Completion within the budg	246	4.24	0.85	0.20
	Beneficiary satisfaction	246	4.36	0.88	0.20
	Overall	**246**	**4.28**	**0.70**	**0.16**

Note: Author's own work

The results indicated that beneficiary satisfaction was highly rated [M=4.36, SD=0.88, CV=0.20] indicating that beneficiaries were satisfied with performance of climate smart agricultural productivity program in Kitui county. Timely completion was rated positively [M=4.30, SD=0.86, CV=0.20] revealing that program was completed within its period. Further, activity was achievement was rated third [M=4.27, SD=0.83, CV=0.20] revealing that project activities were achieved. In summary, the overall rating for performance of climate smart agricultural productivity program in Kitui county was positive [M=4.36, SD=0.88, CV=0.20] indicating that beneficiaries and program staff were satisfied, program was completed within the time frame, activities were achieved as planned, completed within the budget and the period was realistic.

The study conducted correlation analysis using Pearson product moment method to determine the relationship between monitoring and evaluation tools, capacity building, stakeholder participation and performance of climate smart agricultural productivity program in Kitui County. The aim was to establish the strength and direction of the association between the variables. Table 5 summarizes the results.

Table 5. Correlation of Monitoring and Evaluation Tools, Capacity Building, Stakeholder Participation and Performance of Climate Smart Agricultural Productivity Program

		Monitoring and Evaluation Tools	Capacity Building	Stakeholder participation	Performance of Climate Smart Agricultural Productivity Program
Monitoring and Evaluation Tools	Pearson Correlation	1			
	Sig. (2-tailed)				
	N	246			
Capacity Building	Pearson Correlation	0.827**	1		
	Sig. (2-tailed)	.000			
	N	246	246		
Stakeholder participation	Pearson Correlation	0.792**	0.887**	1	
	Sig. (2-tailed)	.000	.000		
	N	246	246	246	
Performance of Climate Smart Agricultural Productivity Program	Pearson Correlation	0.783**	0.820**	0.755**	1
	Sig. (2-tailed)	0.000	0.000	0.000	
	N	246	246	246	246
**. Correlation is significant at the 0.01 level (2-tailed).					

Note: Author's own work

The results revealed the relationship between monitoring and evaluation tools and performance of climate smart agricultural productivity program in Kitui County had a positive and strong relationship (r=0.783). Capacity building had a positive and strong relationship with performance of climate smart agricultural productivity program in Kitui County (r=0.820). Stakeholder participation had a positive and strong relationship with Performance of Climate Smart Agricultural Productivity Program (r=0.755) at $p<0.05$. This result indicated that there was linear relationship between dependent variable and independent variables. Additionally, this indicated that Monitoring and evaluation tools, Capacity building, Stakeholder participation positively influence Performance of Climate Smart Agricultural Productivity Program in Kitui County, Kenya.

IV. Hypothesis Testing and Discussion of Findings

This chapter presents regression and testing of study hypotheses. Hypothesis testing was done to establish the statistical significance of the independent variables on the dependent variable. The testing was done based on ordinary least squares (OLS) regression results, under OLS regressions, the values, R, $R^{2,}$ F-ratio, t-values and p-values were obtained. The R-value shows the strength of the relationship between variables. R^2 (co-efficient determination) value shows the extent to which variations in independent indicators explain indicators of the dependent variable (goodness of fit or explanatory power). The F-Value shows the statistical significance of the overall model, t-values represent the significance of the individual variables, Beta values show the influence of the independent variable on the dependent variable (positive or negative) and p-values represents the confidence level at 95% or 0.05 significant level at which point a decision to confirm the hypothesis was made at values of F and α $p<0.05$. The decision rule adopted is if p-value < α, reject the null hypothesis and accept the alternative hypothesis and if p-value > α, accept the null hypothesis and reject the alternative.

The objective was to determine the joint effect of monitoring and evaluation tools, capacity building and stakeholder participation on performance of climate smart agricultural productivity program in Kitui County, Kenya. The dependent variable performance of climate smart agricultural productivity program which comprised of the following composite index; Timely completion, Realistic project period, Activity achievement, Completion within the budget, and Beneficiary satisfaction. The dependent variable was a composite index of M&E tools, which comprised of Gantt chart, Logical framework and baseline surveys. The Moderating variable was Capacity building made up of the following composite index: Level of training, technical skills and technical competence. The intervening variable was Stakeholder participation made up of the following composite index: Planning, Implementation and decision-making. In order to evaluate the statistical link on joint effect of monitoring and evaluation tools, capacity building and stakeholder participation on performance of climate smart agricultural productivity program in Kitui County, Kenya, the following null hypothesis was tested.

*H_{01} M&E tools, capacity building, and stakeholder participation have no significant joint effect on performance of climate smart agricultural productivity program in Kitui County, Kenya***.**

To determine the joint effect of monitoring and evaluation tools, capacity building and stakeholder participation on performance of climate smart agricultural productivity program in Kitui County, Kenya. The following multiple linear regression model was run and results summarized in Table 6.

$PCSAPP = \beta_0 + \beta_1 MET + \beta_2 CB + \beta_3 SP + \varepsilon$

Table 6. Regression joint effect of monitoring and evaluation tools, capacity building and stakeholder participation on performance of climate smart agricultural productivity program

(a) Model Summary							
					Change Statistics		
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	Sig. F Change
1	0.841[a]	0.707	0.704	0.37840	0.707	195.076	0.000

(b) Goodness-of-Fit ANOVA						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	83.796	3	27.932	195.076	0.000[b]
	Residual	34.651	242	0.143		
	Total	118.446	245			

(c) Beta Coefficients						
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	0.043	0.178		0.240	0.811
	Monitoring and Evaluation tools	0.359	0.070	0.324	5.099	0.000
	Capacity Building	0.587	0.095	0.517	6.151	0.000

Stakeholder participation	0.045	0.087	0.040	0.521	0.603

a. Dependent Variable: Performance of climate smart agricultural productivity program.

b. Predictors: (Constant), Monitoring and Evaluation tools, Capacity Building, Stakeholder participation

Note: Author's own work

The results reveal that, the overall regression model of joint influence of Monitoring and Evaluation tools, Capacity Building, Stakeholder participation had a high explanatory power. The coefficient of determination R=0.841, $R^2 = 0.707$, adjusted R square=0.704, that is, the joint effect of the study variables explained 70.4 percent of the changes in performance of climate smart agricultural productivity program in Kitui County and therefore, 29.6 percent of the changes in performance of climate smart agricultural productivity program was explained by other variables not considered in this study. ANOVA test was conducted and the results indicated that the overall model was significant since F=195.076, $p=0.000<0.05$ and, therefore the null hypothesis was rejected meaning that there was a significant joint effect of M&E tools, capacity building, and stakeholder participation on performance of climate smart agricultural productivity program in Kitui County, Kenya.
On individual significance, the constant with p=0.811, and stakeholder participation p=0.603 were not significant since their p-values were greater than 0.05 significance level, whereas monitoring and evaluation tool and capacity building were significant because its p-values (0.000) were less than 0.05 level of significance. The resulting prediction equation was PCSAPP = 0.043 + 0.359MET + 0.587CB + 0.045SP, meaning that if monitoring and evaluation tool and capacity building were increased by one unit performance of climate smart agricultural productivity program would program in Kitui County, on the average increase by 0.359 and 0.587CB units, respectively. In conclusion, and using the standardized coefficients, it is more prudent to enhance capacity building as one unit change in it has, on average, more impact on performance of climate smart agricultural productivity program in Kitui County.

V. Discussion

In reference to the literature reviewed, the study results are in line with the findings of Sharon and Dori (2017), who conducted a study to assess model-based project–product lifecycle management and Gantt chart models. The results indicated that understanding the details contained in the object process methodology based on the project product lifecycle management plan is easier compared to the corresponding details displayed through the Gantt chart. It enables communication and understanding between project managers and systems engineers, thereby achieving project outcomes, improving performance, and enhancing decision-making. Further, Waithera and Wanyoike (2015) undertook a study to determine whether staff training has an impact on M&E execution. The findings showed that project M&E performance for youth-funded agricultural initiatives was positively influenced by staff training. According to the study's findings, a brief course on M&E ought to be provided with the assistance of youth fund managers. Finally, Uddin, Ong, and Matous (2023) carried out a data-driven, network-based analysis of stakeholder engagement variability in public, private, and public–private partnership projects in Australia. The results highlighted structural variations in stakeholder engagement patterns between the public and private spheres and demonstrated how network data and analytical techniques can be used to monitor and manage intricate webs of connections between individuals who have an impact on and are affected by various project types.

VI. Conclusion

The objective of the study was to determine the joint effect of monitoring and evaluation tools, capacity building, and stakeholder participation on the performance of the Climate-Smart Agricultural Productivity Program in Kitui County, Kenya. The null hypothesis was rejected, and the study concluded that M&E tools, capacity building, and stakeholder participation had a significant joint effect on the performance of the Climate-Smart Agricultural Productivity Program in Kitui County. This finding supports the conclusion that monitoring and evaluation tools and capacity building are the most significant influencers of the overall performance of the Climate-Smart Agricultural Productivity Program in the county. In conclusion, and based on the standardized coefficients, it is more prudent to enhance capacity building, as a one-unit change in it has, on average, a greater impact on the performance of the Climate-Smart Agricultural Productivity Program in Kitui County.

Recommendations

Based on the findings, the study makes the following recommendations. Monitoring and evaluation tools, capacity building, and stakeholder participation have a significant joint effect on the performance of the Climate-Smart Agricultural Productivity Program in Kitui County, Kenya. Therefore, program-implementing agencies should endeavor to incorporate monitoring and evaluation tools into the programs during both the design and implementation stages.

At the design stage, a Gantt chart should be developed to guide activity implementation timelines and resource allocation. In order for the program to achieve its targets, a logical framework should be established with Specific, Measurable, Attainable, Realistic, and Time-bound (SMART) indicators to help track the program's progress against set targets. Finally, as the program commences, a baseline survey should be conducted to establish the status of the program beneficiaries. Baseline data will assist in monitoring the impact created by the program.

Since capacity building has a significant joint effect on the performance of the Climate-Smart Agricultural Productivity Program, the study recommends that program implementers be equipped with the necessary skills to effectively and efficiently run the program.

Lastly, stakeholder participation also has a significant joint effect on program performance. The study recommends that stakeholders be involved during program implementation especially in planning, execution, and decision-making processes. This will increase the program's success and ownership rates.

Implication of the study to Practice and Policy

With the increasing focus by the government on promoting agriculture for food and nutrition security, National Agriculture Research Systems (NARS) institutions require more investment in innovative and beneficiary-focused approaches. Of central importance to the current study was performance, measured in terms of timely completion, realistic project duration, activity achievement, completion within budget, and beneficiary satisfaction critical indicators of the success of agricultural programs. Equally, the inputs to performance namely, monitoring and evaluation tools, capacity building, and stakeholder participation can be applied as management strategies. Program managers should support the formulation of tools that would lead to the full implementation of the monitoring and evaluation process. Continued investment in training related to project management and interpersonal relations for personnel will be required. This will enhance their expertise and professionalism, ultimately leading to improved delivery capacity. These measures would have a positive influence on agricultural programs.

Policymakers will directly benefit from the outcomes of the current study in developing strategies to enhance the performance of agricultural programs. Sector policy formulation will be supported by informed decisions based on implementers' experience to guide agriculture-related development. Agriculture is an important driver of economic growth by creating employment and improving food and nutrition security. Furthermore, the study will apprise policymakers of the importance of adopting monitoring and evaluation tools to improve the performance of agricultural programs.

The conclusion that capacity building is the main factor influencing the performance of the Climate-Smart Agricultural Productivity Program, and that monitoring and evaluation tools have a significant influence on that relationship, will guide resource allocation. Apportioning larger proportions of budgetary resources to capacity building as well as to physical and non-physical systems related to monitoring and evaluation, and to well-trained employees will enhance the performance of Climate-Smart Agricultural Programs. This would, in turn, enhance income-generating activities and the overall profitability of agricultural enterprises. NARS institutions will use the results of the current study to strengthen support for national strategy formulation in the agricultural sector and promote its growth.

Implication Of the Study to Research

The study assessed the joint effect of monitoring and evaluation tools, capacity building, and stakeholder participation on the performance of the Climate-Smart Agricultural Productivity Program in Kitui County, Kenya. The study has empirically established that M&E tools, capacity building, and stakeholder participation have a significant joint effect on the performance of the Climate-Smart Agricultural Productivity Program in Kitui County. This finding will contribute significantly to the body of knowledge.

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Competing Interest Statement

There are no conflicts of interest to declare related to this article.

Author's Contribution Statement

The authors revised the manuscript, and all read and approved the final document for submission. The corresponding author, Peter Kamau Nduati, developed and edited the manuscript according to the recommended guidelines. Professor Stephen Wanyonyi Luketero, Dr. Johnbosco Kisimbii, and Dr. Mary Nyawira Mwenda reviewed and approved the manuscript for submission.

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