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Participatory Project Monitoring and Evaluation and Performance of Mango Farming Projects in Makueni County, Kenya

Charles Kyale Kisumbi, PhD Candidate
Department of Management Science and Project Planning, Faculty of Business and Management Sciences, University of Nairobi, Kenya
Dr. Angeline Sabina Mulwa, PhD
Dr. John Mwaura Mbugua, PhD
Senior Lecturers, Faculty of Education, Department of Educational Management, Policy and Curriculum studies, University of Nairobi, Kenya

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Abstract

This paper focuses on showing the necessity of crafting a feasible project monitoring and evaluation policy which would be an indispensable appraisal tool for assessing the performance of mango projects. It is extracted from the PhD thesis, which aimed to establish the influence of participatory monitoring and evaluation of mango farming projects in Makueni County, Kenya. A pragmatic research paradigm, a descriptive study plan, and a multi-stage sampling technique were used in the study. A sample of 375 respondents using the Krejcie and Morgan tabulation formula was selected from a population of 12,622 mango farmers. Descriptive and inferential statistics were used as tools for quantitative data analysis, while the content analysis was used for qualitative data analysis. The null hypothesis that there was no significant relationship between the participatory monitoring and evaluation of the project and the performance of the mango farming projects was tested using the correlation and the F-test. The results presented a statistically significant correlation at 95% confidence level with DF (2,367) F=4.756, t=2.269 at level of significance, P=0.000<0.05, r=0.0879 and R square=

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0.0773. The null hypothesis was therefore rejected, illustrating a significant relationship between the participatory project M&E and the performance of the Mango projects. Based on the results, the study identified a pressing need to use participatory project monitoring and evaluation to address performance issues across the mango value chain. Partnership Support between national and county governments was necessary to engage key experts in the field of agricultural extension, in order to engage mango farmers in improving mango performance.

Keywords: Participatory project monitoring and evaluation, mango projects performance, preharvest and postharvest phases, project management practices, project stakeholders

Introduction

The study investigated the influence of participatory project monitoring and evaluation of mango farming projects in Makueni County, Kenya. Mango farmers grappled with many problems that affected performance, which led to reduced production and income. Poverty level in Makueni County was reported to be about 60.6% (KNBS, 2019), and yet many farms were teeming with mango trees. The mango tree economic performance could be enhanced to improve and spur economic growth for the rural community. However, there has been concerted effort to eradicate poverty by empowering mango farmers through the establishment of Makueni Fruits Processing Plant, for the purpose of value addition and stabilization of mango prices (Farmbizafrica, 2018). A Mango report by Horticultural Crops Directorate (HCD) ranked Makueni County as the top mango-producing region and yet mango farmers benefited least in their mango sales (Freshplaza, 2019).

Mango sales projections revealed fluctuations ranging between 3.5b to 5b depending on environmental factors, preharvest and postharvest challenges prevailing in any given year, and yet fewer farmers did break-even (Freshplaza, 2019). Nevertheless, despite this impressive camouflaged mango production and marketing achievements, poverty levels in Makueni County have remained quite high, currently standing at 60.6 % (KNBS, 2019). This might be deduced to mean that mango farmers did not benefit much from their mango production. For instance, in India, middlemen menace was reported as a big problem in the mango sector (Purushottam, 2015). In spite of this, cultivation of mango fruit globally is surpassing many other popular fruits due to consumers' realization of its nutritional value such as medicinal content, vitamins, antioxidant properties and other health benefits (Lauricella, Emanuele, Calvaruso, Giuliano & D'Anneo, 2017).

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Consequently, the lack of proper participatory project Monitoring and Evaluation in mango projects impaired the quality of mangoes, and it is inherently widespread in the study area. The participatory project M&E seemed to be a tedious job to be undertaken by agricultural extension experts and mango farmers, as they addressed mango problems when the damage had already occurred. Through M&E, quality can be sufficiently enhanced throughout the post-harvest phase, because the quality and quantity cannot be rectified during post-harvest stages, when damage has occurred. Stakeholder involvement in development projects has improved the performance of community megaprojects, regardless of the perception of a project manager (Maddaloni & Davis, 2017). Due to the cost constraints of inputs and mango planting timelines before mango maturity, mango farmers were usually on their own from pre-harvest phase to post-harvest phase. It has been alluded that performance of CBOs agricultural development projects had shown to have had many inherent problems which translated to low returns (Simiyu, Ngugi & Minja, 2018).

Project management is a cross-pollination of disciplines that can be adopted and applied to all types of projects in private and public sector. This helps to manage and evaluate communication, and coordinate the best management practices that has a significant impact on project's success, through the project life cycle phases of planning and execution (Usman, Soomro & Brohi, 2014; Ihesiene, 2014; Tahir & Naeem, 2017; Siddique, Ahad & Din, 2019). When project plans are implemented with many inherent problems, and without the support of M&E, they are bound to fail along the way. For mango projects to increase production, agricultural extension officers should always ensure the success of participatory project monitoring and evaluation to enhance mango performance. The impact of the project's success is dependent entirely on the leadership of project management practices, the experience of the project manager, and an enabling work environment (Tahir & Naeem, 2017). According to PMI Project Management (PMBOK), the 10 project knowledge areas should be monitored and controlled appropriately throughout the modern development life cycle to minimize project uncertainties (Usman, Soomro & Brohi, 2014; PMI's PMBOK, 1996).

National transformation and sustainable development can be revitalized through the establishment and application of project management methods, under auspices of acceptable economic and the prevailing political climate that guarantees a serene environment, to achieve effective and efficient project delivery (Ihesiene, 2014). Agricultural extension training courses involving M&E methods should always be available to farmers to improve their mango managerial skills to control diseases and pest infestations. Benchmarking, coaching, and mentorship on modern M&E

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methods in mango production is bound to enhance performance in M&E, training on current agricultural practices, better understanding of mango skills, and improved production. Stakeholder participation in M&E enhances the prerequisite technical knowhow. Furthermore, proper mango management skills should be taught to farmers as a way of increasing production. It is therefore of paramount importance that mango policies are framed in such a way as to be strategically aligned with mango production and markets. Land tenure systems should also be formulated in a way that would improve production in the agricultural sector. It has been alluded that the agricultural sector is the mainstay of Kenya's economy, and it should always be strengthened through the participation of various stakeholders (Simiyu, Ngugi & Minja, 2018).

Objective of the Study

The objective of the study is to establish how participatory monitoring and evaluation influences the performance of mango farming projects in Makueni County, Kenya.

Research Hypothesis

The null hypothesis stated that there was no significant relationship between participatory project monitoring and evaluation and performance of mango farming projects in Makueni County, Kenya.

2. Literature Review

Monitoring and evaluation are project control tools that address project creep and other discrepancies that compromise project deliverables within a community. Through participatory project monitoring and evaluation, gaps are controlled and the overall performance of mango management projects in various project environments is influenced. The use of M&E is critical in projects because it is a steady-state corrective tool to influence performance. Yield improvement through monitoring of progress is important for monitoring and evaluating gaps, so that mango projects remain on track during the pre-harvest and post-harvest phases. The results of an empirical study of M&E on the influence of horticulture projects revealed that the element of human resource capacity and human capital development contributed an incremental change in terms of productivity and performance (Murei, Kidombo & Gakuu, 2018).

M&E is able to track achievements in mango production by controlling diseases and pest infestations through good management practices that require good care of mango trees. An empirical study alluded to the existence of over 260 species of insects and mites were most prevalent in many mango orchards and eventually affected performance (Muhammad, Iqbal Saeed, Javed &

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Khalid, 2013). Monitoring and evaluation in mango production are very important in managing and controlling pests and diseases which are prevalent in infesting mango foliage, buds and tree trunks, leading to reduced mango production (Muhammad, Iqbal, Saeed, Javed & Khalid, 2013; Grieshbach, 2011). Project M&E is important in development projects as it helps various project stakeholders to know the extent to which their projects met the set goals and objectives, in order to realize the desired effect (Kyalo, Mulwa & Nyonje, 2015). Monitoring and evaluation are a deliberate process that involves a systematic effort of collecting and analysing information in order to promote efficiency and effectiveness in the use of project resources to strengthen project performance (Kyalo, Mulwa & Nyonje, 2015). Ibid, M&E evaluates and measures a project's progress by examining its strengths, weaknesses, and impact. A study showed that lessons learnt from China's experiences is able to increase agricultural production for faster rural development and could be replicated in food production to reduce poverty (Kevin & Fan, 2014).

Monitoring and evaluation are essential to verify whether the project is achieving its expected outcomes during the start-up, planning, and implementation phases of the project. Failure to use M&E to monitor agricultural progress precipitated the Chinese famine of 1958 to 1961, which plunged the entire country into famine (Jisheng, 2013). Without M&E, mango quality would not be standardized to satisfy consumers' expectations. Project monitoring and evaluation, land tenure systems and ownership are crucial to the future sustainability and overall performance of mango projects in rural areas. The use of M&E measures in the mango supply chain may have a long-term impact on the quality of mango fruit (Brecht, Mitcham, Sargent & Kader, 2009).

Project management is multidisciplinary, involving the cross-pollination of disciplines to provide information, which can be used to verify mango production decisions by a variety of meso-experts. Stakeholder engagement involving a combination of efforts, underpinned by development strategies, leads to the reduction of hunger and poverty through the development of agriculture and infrastructure (Kevin, Claire & Fan, 2014). Monitoring and evaluation should be included in farm management policies to evaluate mismanagement in mango orchards. More broadly, M&E addresses the healthy restoration of biodiversity, ecosystem services at the project landscape level, in order to increase the diversity of restoration and production objectives (Hughes, Adams, Butchart, Field, Kelvin & Warrington, 2016). To enhance the benefits of mango production, sustainability of systems must be implemented, highlighted, and coordinated with pest management by experts in order to achieve higher production (Mele, Nguyen, & Huis, 2010). It appears that in most developing countries, there are endemic shortages of

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quality mangoes due to poor planning and lack of utilization of M&E to monitor production. To increase mango production, different Morphotypes should be studied in nurseries prior to transplanting seedlings under different environmental and climatic conditions (Baita, Manga & Mustapha, 2010).

There should be a management style that provides good projects from start to finish. In order to increase mango production, a suitable rootstock would need to be adapted to the local climate (Baita, Manga & Mustapha, 2010). It has been suggested that all aid agencies that assist farmers should reorganize their efforts for agricultural projects to enhance production (Crawford & Bryce, 2003). The absence of M&E in mango projects can lead to substantial losses. The lack of markets for mangoes has led to rotting mangoes, causing environmental degradation and a health threat to everyone (Lorenzo-Santiago, Juárez-López, Rosas-Acevedo, Rendón-Villalobos, Turin-Jiméne & García-Hernández, 2018). M&E is a useful tool for reporting project design and assessment status (Crawford & Bryce, 2003). Environmental policy should be incorporated into M&E to monitor and control mass-produced mango waste and take appropriate measures for the safe disposal of waste (Lorenzo-Santiago, Juárez-López, Rosas-Acevedo, Rendón-Villalobos, Turin-Jiméne & García-Hernández, 2018).

In the mentoring of farmers in the use of M&E tools in mango farming, the production failures recorded before and after the harvest could have been reduced to manageable levels. If the participatory monitoring and evaluation system functioned optimally in mango farming, mango farmers would not suffer significant mango losses during the post-harvest period. Mango is affected by pests that eventually cause significant losses to mango-producing communities (Nankinga, Isabirye, Muyinza, Rwomushana, Stevenson, Mayamba, Aool & Akol, 2014). Agricultural extension is considered the best way to manage good management practices to transfer management and innovative expertise to increase mango production. The lessons of agricultural development in Africa relate to openness and liberalization, which is supported by a process of developing evidence-based agricultural policies for rural development to stimulate policies in favour of the poor (Kevin, Claire & Fan, 2014). Agricultural development is at the heart of food security to eradicate poverty by linking it to identifying possible policies to boost food production (Bonan, Pareglio & Rotondi, 2015).

Agricultural projects that were monitored and evaluated achieved planned production targets for farmers. Project evaluation helps to clarify the objectives of mango farming to establish well-defined measures and controls to improve performance. M&E helps policymakers shape policies through conscious decision-making processes that result to efficiency and cost-effectiveness (Bonan, Pareglio & Rotondi, 2015). In the agricultural sector, integration of M&E is able to achieve its intended objectives (Malley, Hart,

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Buck, Mwambene, Katambara, Mng'ong'o & Chambi, 2017). Challenges facing community development projects are primarily due to skills shortages and poor infrastructure development in rural areas (Shava & Thakhathi, 2016).

The lack of M&E seems to transcend the majority of agricultural projects in developing countries. This could be due to a lack of adequate training in M&E in agricultural and mango production as young energetic people's disinterest in agricultural activities is endemic. This explains the poverty in the developing world, where arable land is abundant and weather conditions are good, but food security still remains dire. Professional advice on the use of M&E should be linked to services and projects by experts (Shava & Thakhathi, 2016). Furthermore, a better application of M&E has led to an improvement in agricultural development in LRAD projects (Antwi & Oladele, 2013). Monitoring and evaluation services for the Smallholder Rice Project were managed based on socio-economic factors through Planning, Programs and Monitoring Units (PPUPs) to achieve expected outcomes (Akroyd, 1999). The logic framework approach was not routinely used as a project planning tool in organizations, but in agricultural projects, experts had their own M&E approaches that worked (Akroyd, 1999).

The use of M&E tools provides the idea of well-managed projects in a variety of project environments to exploit the socio-economic benefits of improved mango production. The overall economic benefits of M&E projects would be food security, employment, and sustainability of farmers' returns from mango sales. The use of M&E has been consistently used in projects to effectively conduct social assessments in project execution (Golini, Corti & Landoni, 2017). To ensure successful project implementation, the project environment must be sufficiently conducive for a viable emerging agricultural sector that benefits most farmers (Verschoor, Rooyen & D'Haese, 2005). M&E is a significant leverage tool for all projects that monitors and evaluates changes to control hidden project pitfalls and risks. Many agricultural planners tended to concentrate on technical, financial and economic issues, but gave little attention to socio-economic analysis, institutional, environmental and health issues, that were just as significant (Akroyd, 1999).

Lack of technical expertise in M&E, which exacerbated fruit fly infestations, was a big issue that required M&E controls before damage occurred. Existing mango policies and regulations did not appear to be working effectively and efficiently to prevent the threat from intermediaries with unfair prices that made mango farmers unable to make a profit. Inaccurate methods of planting and harvesting have tended to deteriorate the quantity and quality of mangoes, leading to lower incomes (FAO, 2017). There was a lack of financial means to buy farm inputs that are costly and have affected production. Mango growers also faced challenges in the use of WHO Class I and II toxic sprays that required expert handling for health reasons

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(Mele, Nguyen & Huis, 2010). Unstructured mango markets without organized co-operatives predisposed mangoes to the very low prices of Kshs1.70 per piece of mango (Muthini, 2015). Inefficiencies in mango production are exacerbated by the lack of adoption of good project management practices, detailed in participatory project monitoring and evaluation measures, which keep project performance on track.

Theoretical Framework

Basically, a theoretical framework is an organized structure consisting of research concepts, which supports the theory toward understanding the trajectory of the problem statement in an empirical study. A theory merely explains the ontological phenomenon studied by identifying the main theoretical ideas and the epistemological concepts that accompany it, by describing the interrelations between the concepts studied (Torraco, 2004). Essentially, concepts or elements are common to most methodologies in theoretical building processes, which presupposes independent and dependent variables (Torraco, 2004). Moreover, a well-built theory gives clarity to a complex ontological phenomenon studied in regards to how things or objects are in the real world (Dubin, 1976). In addition, theory underpins an understanding of fundamental theoretical ideas and their interrelationships with what is being studied (Dubin, 1976).

Project management theory was adopted because it supported and reinforced M&E in projects by monitoring other key components of the project management lifecycle phases (Warburton & Cioffi, 2014). The study also used other supporting theories, the citizen participation ladder theory, which is democratic and technocratic in nature in the redistribution of power to the '*powerful'* and '*powerless',* through community-based planning processes (Arnstein, 1969), stakeholder theory (Freeman, 1984), and theory of constraint (Goldratt, 1990). These theories have been used because they are participatory and involve bringing together various stakeholders to participate in monitoring and evaluation activities to monitor and control project deviations.

Conceptual Framework

The theoretical framework is basically positioned in word narration and anchored around the theory of the study, while the conceptual framework is represented schematically to show the two variables of the study. The theoretical framework is usually organized in terms of the conceptual framework indicating the independent study variable pointing to a dependent variable (Chinn & Kramer, 1999). Stakeholder theory, ladder theory, constraint theory, and project management theory are complementary. They all addressed the needs of different stakeholders to participate in mango

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projects, which were undertaken through the threefold constraint of cost, scope, and time. The conceptual framework emphasizes the interplay between independent and dependent variables:

Independent Variable **Dependent Variable**

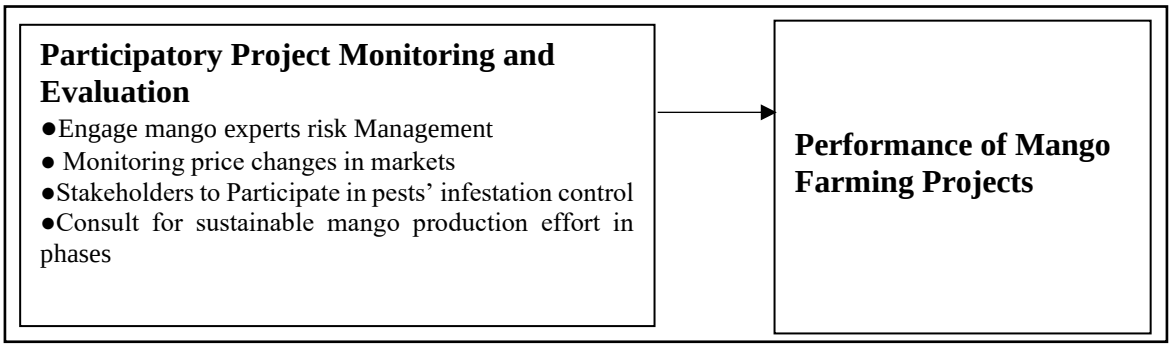

Figure 1. Conceptual framework for participatory project monitoring and evaluation of mango farming projects in Makueni County, Kenya

3. Research Methodology

Research Paradigm and Research Design

A paradigm is a worldview that guides and directs a researcher to a specific path to undertake empirical research (Kuhn, 1962). This study relied on a pragmatic research paradigm since it ensures a mixed method approach as it involves the use of quantitative and qualitative data in data collection and analysis. The value of a research paradigm in this study was to support philosophical hypotheses that inform research underpinnings and actions grounded in theory (Gakuu, Kidombo & Keiyoro, 2018). Descriptive research design and correlational research design were used in this study as a guide for the use of descriptive and inferential statistics in data collection and analysis.

Study Population, Sample Size, and Sampling Technique

The study involved a population of 12,622 mango farmers, of which 375 respondents were selected using the Krejcie and Morgan (1970) table formula. A total of 369 questionnaires was returned and analysed. A multi-stage sampling technique was employed to collect data from respondents.

Validity, Reliability, and Piloting

The questionnaires were validated using a pilot study in which qualitative data were analysed using content analysis and quantitative data were analysed using Cronbach Alpha, as reported (Cronbach, 1951). The Cronbach alpha value for participatory project monitoring and evaluation was 0.778, which was above the recommended minimum threshold of 0.7 for an empirical study.

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Data Analysis

The data were analysed using a statistical software package for the Social Sciences (SPSS) version 25 to obtain the results. The null hypothesis was tested and the statistical significance of the relation interpretations was based on the Fisher F test (Fisher, 1935) and the Gosset t-test values. Descriptive and Pearson product moment correlation was used as a tool for analysing quantitative data, while qualitative data was analysed using content analysis.

4. Results and Discussion

Participatory Project Monitoring and Evaluation and Performance of Mango Farming Projects

The result shows how participatory monitoring and evaluation influenced the performance of mango ranching projects in Makueni County, Kenya. Descriptive and inferential statistics were utilized. Twelve (12) Likert scale items were presented to the respondents and requested to indicate their level of agreement with the given statement on a scale of **1 to 5** with **SD**= strongly disagree, **D**= disagree, **N**= neutral, **A**= agree, and **SA**= strongly agrees. The findings are presented in Table 1.

Table 1. Descriptive Analysis of Participatory project monitoring and evaluation and performance

No.	Statement	SD F (%)	D F (%)	N F (%)	A F (%)	SA F (%)	Mean	SD
15a	Monitoring and evaluation, risk management control, is undertaken in pre-harvest and post-harvest phases	20 (5.4)	26 (7.0)	86 (23.3)	109 (29.5)	128 (34.7)	3.8	3.46
15b	Infestations of mango pests and diseases are attended to when noticed in mango production	40 (10.8)	58 (15.7)	18 (4.9)	142 (38.5)	111 (30.1)	3.6	3.35
15c	Farmers do not engage experts in the prevention of mango diseases and pests	30 (8.1)	30 (8.1)	12 (3.3)	120 (32.5)	177 (45.0)	4.1	3.72
15d	Mango farming trainings are not usually availed to mango farmers for good management practices	30 (8.1)	21 (5.5)	99 (26.8)	107 (29)	112 (30.4)	3.9	3.58
15e	Mango farmers consult widely in running of their mango farms to increase production	159 (43.1)	102 (27.6)	64 (17.3)	20 (5.4)	24 (6.6)	2.05	2.82
15f	Mango farmers are not capable of controlling mango pests and diseases by themselves	100 (27.1)	92 (24.9)	86 (23.3)	30 (8.1)	31 (8.3)	2.2	2.97
15g	Mango farmers are involved in agricultural extension services to acquire more knowledge	56 (15.2)	88 (23.8)	96 (26.0)	79 (21.4)	50 (13.6)	2.9	315

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15h	Mango farmers do not have good mango storage facilities to prevent post-harvest losses	24 (6.5)	50 (13.6)	14 (3.8)	122 (33.1)	159 (43.1)	3.9	2.98
15i	High production of mango is experienced in mango farming projects	59 (16.0)	68 (18.4)	185 (50.1)	20 (5.4)	37 (10.0)	2.8	2.24
15j	The challenges of mango markets, prices and consumption are not monitored and evaluated	117 (31.7)	116 (31.4)	85 (23.1)	25 (6.8)	26 (6.9)	2.3	2.63
15k	Pre-harvest and Post-harvest waste and spoilage is monitored and evaluated for increased output	25 (6.8)	50 (13.6)	68 (18.4)	104 (28.2)	122 (33.1)	3.7	1.43
15l	Monitoring and evaluation experts are not consulted to look at the quality success of mangoes meeting local and international market standards	120 (32.5)	104 (28.2)	62 (16.8)	40 (10.8)	43 (11.7)	2.4	1.47
	Composite mean and standard deviation						3.13	2.81

n=369
Composite mean =3.13
Composite standard deviation=2.81
Cronbach's Alpha (a) Reliability coefficient =0.778

Table 1 shows, overall, the composite mean (M) of 3.13 for participatory project monitoring and evaluation and the standard deviation of 2.81. This implied that respondents were more neutral on the twelve points. The Cronbach alpha (a) reliability coefficient was 0.778. Hence, this indicated that the items had a strong internal consistency.

The objective of item 15a was to establish an opinion on the statement that monitoring and evaluation, risk management control, are undertaken before and after harvest. Results show that a majority (45%) of respondents strongly agreed. This item averaged 4.1 and SD 3.72, indicating that they were in agreement with the statement. The mean was more than composite mean, which implies that monitoring and evaluation, risk management, and control influenced the performance of mango projects. Key informants indicated that monitoring and evaluating the project during the pre- and post-harvest phases were important to project stakeholders to achieve the desired impact. One interviewee stated that:

> *"To improve the performance of mango projects, progress needs to be monitored in order to monitor and evaluate gaps so that mango projects remain on track between the pre-harvest and post-harvest stages".*

The findings are consistent with those of Kyalo, Mulwa and Nyonje (2015) who reported that monitoring and evaluation was a deliberate process

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involving a systematic effort to collect and analyse information. In this case, the pre- and post-harvest phases required M&E to control discrepancies, promote efficiency and effectiveness in the use of resources to improve performance. An empirical study of SME projects revealed that most of the failures were due to the lack of participation of end-users in the application of the Monitoring and Evaluation Unit (EMU) guidelines (Ihesiene, 2014). Ibid, Internal and environmental factors were cited as the main contributors to market and strategic failures, in addition to lack of access to the use of past project failure experiences (Ihesiene, 2014).

The purpose of item 15b was to establish respondents' views on the claim that outbreaks of mango pests and diseases were treated when observed in mango production. The findings revealed that the majority (38.5%) of respondents agreed. The point had a mean of 3.9 and SD of 3.4 indicating agreement. The mean was above the composite mean, meaning that infestations of mango pests and diseases had an influence on the performance of mango projects. Key informants indicated that pests and diseases were not treated on a timely basis, thereby reducing production. Similarly, one respondent stated that:

> *"Monitoring and evaluation are very important in managing and controlling widespread pests and diseases in mango production, infesting mango foliage, buds and tree trunks, leading to a reduction of mango production".*

This is in agreement with Muhammad, Iqbal, Saeed, Javed and Khalid (2013), who argued that M&E is an important tool for tracking mango diseases and pest control through good management practices. The M&E Units (MUEs) guidelines aim to audit project failures, including failures in communication, leadership, and governance (Ihesiene, 2014). The majority of failures were due to a lack of project resources and a lack of awareness of early warning signs by project stakeholders that were not considered (Ihesiene, 2014).

Item 15c established opinion of the respondents on the statement that farmers did not engage experts in the prevention of mango diseases and pests. Results indicated that the majority (45%) of the respondents strongly agreed. The item had a mean of 4.1 and SD of 3.72 indicating that they agreed with the statement. This mean was more than the composite mean implying that engagement experts in the prevention of mango diseases and pests had an influence on the performance of mango projects. These results were supported by interview results where one farmer said:

> *"Engaging experts in preventing mango diseases and pests is usually very costly and therefore most farmers do not engage them in mango farming."*

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The results were consistent with Muhammad, Iqbal, Saeed, Javed and Khalid (2013) on mango production as it was established that M&E was vital in managing pests and diseases, as they infested mango foliage, buds and tree trunk, thereby reducing the output of mangoes. Item 15d sought to establish opinion on the statement that mango farming trainings were not usually availed to mango farmers for good management practices. The results indicated that the majority (30.4%) strongly agreed. The item had mean of 3.9 and SD of 3.6 indicating they agreed with the statement. The mean was more than the composite mean implying that mango farming trainings had an influence on the performance of mango projects.

Item 15e sought to establish the opinion of respondents on the statement that mango farmers consulted widely in the running of their mango farms to increase production. The results indicated that the majority (43.1%) strongly disagreed with the statement. The item had a mean of 2.05 and SD of 2.82 indicating they disagreed. The mean was less than the composite mean implying the item had no influence on performance. Item 15f had sought to establish opinion on the statement that mango farmers were not capable of controlling mango pests and diseases by themselves. Results indicated that 27.1% of the respondents strongly disagreed with the statement. The item had mean of 2.2 and SD of 2.9 indicating they disagreed with the statement. The mean was less than the composite mean implying M&E risk management control had no influence on the performance of mango. Item 15g had sought to establish the opinion of the respondents on the statement that mango farmers are involved in agricultural extension services to acquire more knowledge. The results indicated that 23.8% of the respondents were neutral about it. The item had a mean of 2.3 and SD of 3.2 indicating that the respondents were neutral about the statement. The mean was slightly more than the composite mean implying the item had an influence on the performance of mango projects. These results were supported by the interview results where one mango farmer said,

> "*Mango farmers' participation in agricultural extension services, capacity mentorship and management training can increase mango production. It is also important to understand mango importers in order to try to meet prescribed mango quality thresholds and standards from the needs of global community"*

Item 15h had sought to establish the opinion of the respondents on the statement that mango farmers did not have good mango storage facilities to prevent post-harvest losses. The results indicated that the majority (43.1%) strongly agreed. The item had mean of 3.9 and SD of 2.9 indicating they agreed with the statement. This mean was more than the composite mean

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implying that mango storage facilities had an influence on the performance of mango projects.

Item 15i sought to establish the opinion of the statement that high production of mango is experienced in mango farming projects. The majority (50.1%) of the respondents were neutral about it. The item had a mean of 2.8 and SD of 2.24 indicating them to be neutral. This mean was more than the composite mean implying that the item had an influence on mango projects. Item 15j sought to establish the opinion on the statement that the challenges of mango markets, prices, and consumption were not monitored and evaluated. The results indicated that the majority (31.7%) of the respondents strongly disagreed. The item had mean of 2.3 and SD of 2.63 indicating they disagreed with the statement. The mean was less than the composite mean implying that the item did not have influence on mango projects. The results are in line with the results of interview schedule where one farmer said,

> *"We as mango farmers undergo a lot of challenges which include; pests and diseases, mango markets and price fluctuations, however, no one seems to care about monitoring and evaluating these challenges so as to assist the farmers."*

Similar views were agreed upon by Kyalo, Mulwa and Nyonje (2015) on the importance of M&E in development projects, where they established that Project M&E was important in development projects as it made various project stakeholders know their challenges and whether their projects met the set goals and objectives to realize the desired effect. Item 15k sought to establish the opinion of respondents on the statement that pre-harvest and post-harvest waste and spoilage was monitored and evaluated for increased output. The majority (33.1%) of the respondents strongly agreed with the statement. The item had mean of 3.7 and standard deviation (SD) of 1.43 indicating they were neutral about it. The mean was more than the composite mean implying that pre-harvest and post-harvest waste and spoilage had an influence on the performance of mango projects.

Item 15l had sought to establish the opinion of the respondents on the statement that monitoring and evaluation experts are not consulted to look at the quality success of mangoes meeting local and international market standards. The results indicated that a majority (32.5%) strongly disagreed with the statement. The item had a mean of 2.4 and standard deviation (SD) of 1.47 indicating respondents disagreed with the statement. The mean was less than the composite mean implying that M&E experts had no influence on the performance of mango projects.

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Correlation Analysis and Linear Regression Model for the Objective

This study used descriptive and inferential statistics in analysing data using correlation analysis on the relationship between the two variables analysed to describe, generalize, and infer the results into the entire student population. The hypothesis and the model of this research are described below:

Hypothesis Testing

$H0_1$: There is no significant relationship between participatory project monitoring and evaluation and performance of mango farming projects in Makueni County, Kenya.

$H1_1$: There is a significant relationship between participatory project monitoring and evaluation and performance of mango farming projects in Makueni County, Kenya.

The hypothesis is stated in the null as advanced by Fisher (1935).

Relationship between Participatory Project Monitoring and Evaluation and Performance of Mango Farming Projects

The Pearson's moment correlation technique was used to determine the relationship between Participatory Project Monitoring and Evaluation and Performance of Mango Farming Projects. The results were presented in Table 2:

Table 2. Correlation between Participatory Monitoring and Evaluation and Mango Performance

		Participatory Project Monitoring and Evaluation	Performance of Mango Farming Projects
Participatory Project Monitoring and Evaluation	Pearson Correlation	1	.722(**)
	Sig. (2-tailed)		.000
	N	369	369
Performance of Mango Farming Projects	Pearson Correlation	.722(**)	1
	Sig. (2-tailed)	.000	
	N	369	369

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

Results in the Table 2 shows that there is a significant positive relationship between participatory project Monitoring and Evaluation and performance of mango farming projects (r= 0.722, p= 0.000). This infers a very strong association between participatory project Monitoring and Evaluation and performance of mango farming projects. Based on the findings, hypothesis H_{04}, which stated that there was no significant relationship between participatory project monitoring and evaluation and performance of mango farming projects in Makueni County, were therefore

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rejected. It was therefore concluded that there was a significant relationship between participatory project Monitoring and Evaluation and performance of mango farming projects in Makueni County. Performance of Mango being the dependent variable is the function of ***f*** (participatory project monitoring and evaluation variable), and hence the simple regression model:

The Regression Model

$Y = f(X_1, X_2, X_3, X_4, \varepsilon)$,

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

$Y = \alpha + \beta_0 X_4 + \varepsilon$.

Model 4: $Y = f(X_4, \varepsilon)$.

Table 3. Simple Linear Regression Results for the Association between Participatory Project Monitoring and Evaluation and Performance of Mango Farming Projects

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.0879(a)	.0773	.0754	.457

ANOVA (b)

Model		Sum of Squares	DF	Mean Square	F	Sig.
1	Regression	25.571	2	8.524	4.756	.000(a)
	Residual	7.529	367	.209		
	Total	33.100	369			

Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	0.030	.356		.083	.000
	Monitoring and Evaluation (X_4)	0.394	.174	.546	2.269	.000

a. Dependent Variable: Performance of mango farming projects

b. Predictor Variable: Participatory Project Monitoring and Evaluation

The results from Table 3 shows that DF (2,367) F=4.756, t=2.269, level of significance

P=0.000<0.05, r=0.0879 and R square= 0.0773. The results signified that 5% level significance and 95% level of significance of the test was statistically significant and, therefore, the null hypothesis was rejected.

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Results in the table show that the adjusted R squared is .0754 which inferred that 7.54% of the variations in performance of mango farming projects were influenced by Participatory Project Monitoring and Evaluation, while the other variables were determined by other factors outside this model. Again, ANOVA results indicated that the model was statistically significant, F (2,367) =4.756. The linear regression model is;

$$Y= 3.03 + 0. 394X_4$$

The beta value of 0.394 inferred that one unit increase in participatory project Monitoring and Evaluation increased performance of mango by 0.394 and vice versa. The study confirmed that the participatory project Monitoring and Evaluation had a significant influence on performance of mango farming projects.

Conclusion

The empirical study findings presented impeccable evidence that participatory project monitoring and evaluation checks and controls performance deviations. Participatory project Monitoring and Evaluation influence the overall performance of mango farming projects in different situations and setups by taking corrective measures and controls to increase production. Improved performance of mango project involves tracking the progress to monitor and evaluate deviations of project creep, so that the mango projects remain on course from pre-harvest to post-harvest stages. Project monitoring and evaluation in mango production is very important in managing and controlling pests and diseases, which are prevalent in infesting mango foliage, buds and tree trunks, leading to reduced mango production. The study found out that quality and quantity can only be improved during preharvest phase, and not along the postharvest phase when damage has already occurred in the preharvest phase.

Recommendation

Monitoring and evaluation are urgently needed in mango projects to improve performance in order to improve rural economies. A robust project monitoring and evaluation policy should be crafted to drive upward mobility change in enhancing mango performance. This study, therefore, recommends that mango farmers should invest more in monitoring and evaluation so as to avoid mango losses associated with pre-harvest and post-harvest problems, which are not detectable early at the onset.

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