



**INFLUENCE OF PROJECT MANAGEMENT PRACTICES ON PERFORMANCE OF AQUACULTURE BUSINESS
DEVELOPMENT PROJECTS IN KISUMU COUNTY, KENYA**

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INFLUENCE OF PROJECT MANAGEMENT PRACTICES ON PERFORMANCE OF AQUACULTURE BUSINESS DEVELOPMENT PROJECTS IN KISUMU COUNTY, KENYA

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ABSTRACT

The impetus of aquaculture as the fastest growing food-producing sector in the world remains key to the attainment of sustainable development goals. Despite the implementation of Economic Stimulus Project - Fish Farming Enterprise Productivity Program (ESP-FFEPP), Kenya's fisheries remain at their production limit at a time of rapid human population growth. It is therefore crucial to understand the aquaculture project management practices, which would engender their heightened performance. Thus, this study investigated the influence of project management practices on performance of aquaculture projects in Kisumu County, Kenya. The specific objectives of the study were to, examine the influence of technological adoption, communication, community involvement and monitoring and evaluation on the performance of aquaculture projects, This study adopted a descriptive survey research design with a target population of 435 farmers, 2 program assistants, 2 monitoring and evaluation experts and 4 extension officers of the 28 farming groups of Aquaculture business development programme from Kisumu County. A sample size of 205 was drawn from a total population of 435 farmers using Krejcie and Morgan Table 1970. Data was collected by using a questionnaires and interview schedules. Reliability was ensured through a Cronbach's Coefficient Alpha of above 0.7, which is generally considered reliable. Data was analyzed using descriptive statistics of frequencies, percentages, mean and standard deviation as well as inferential statistics of correlation and multiple regression analysis using SPSS version 25.0. the four project management practices in this study accounted for $R^2 = 0.721$ which is 72.1% of the variance in project performance. Basing on F-value of 103.52 and a p-value of 0.00 there is a significant influence of project management practices on performance of aquaculture business development projects in Kisumu County, Kenya. In this regard the management of aquaculture projects should address challenges of project performance by strengthening project management practices through their policy framework.

Key Words: Aquaculture Business, Sustainability, Food Production, Technological Adoption, Communication, Community Involvement, Monitoring and Evaluation

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INTRODUCTION

Globally, production from capture fisheries has levelled off and most of the main fishing areas have exhausted their maximum potential giving room for aquaculture projects. Thus, the impetus of aquaculture as the fastest growing food-producing sector in the world remains key to attainment of sustainable development goals (www.eitfood.eu, 2021). In this regard, it is crucial to understand aquaculture projects management practices that would engender heightened performance for realization of economic, social and environmental pillars of sustainability. However, markets, trade and consumption preferences strongly influence growth of the sector, with clear demands for the production of safe and quality products (Gephart, et al., 2020).

Project management practices plays a vital role in aquaculture projects management system. Inputs to project management practice that can lead directly or indirectly to project success are known as CSFs (Alias, Zawawi, Yusof & Aris, 2014). Once appropriate project management practices for any projects have been decided it becomes understandable to implement and to fulfill the requirement of the project (Harison, Sumi & Srivastava, 2015). A project is basically regarded as successfully implemented in the event that it is completed as per the stipulated time (time criterion), in line with the budget set (monetary criterion), meets the purpose (effectiveness criterion) and ends up being accepted and utilized by the recipients for whom it was intended or meant for (client satisfaction criterion) (Wamalwa & James, 2018). According to Jitpaiboon, Smith and Gu (2019), project management tools, best practices and support are important to the success of project implementation and performance. Thus, project management actions, project procedures, human factors, external issues, and project-related elements all play a role in project performance. Project management is accomplished through the application and integration of the project management processes of initiating, planning, executing, monitoring and controlling, and closing (Magagan, 2021). The ability to plan and

succeed under lean economic times depends on effective project management practices. Additionally, it is crucial to demonstrate the value of project management principles while completing the project on schedule.

For sustainability, all companies, whether public or private, functioning in a project setting must implement PM practices in some capacity. According to Fraz, et al., (2016) project management practices include project scope management, project HR management, project communications management, project stakeholder management and project planning communications management, effective project controlling, resource management, quality effective planning, management among others. Njau and Omwenga (2019) notes that project management practices include resource planning, monitoring, top management support and communication. Project management best practices, if adopted at an institutional level increase the prospects in attaining the objectives and deliverables when dealing with projects successfully (Kerzner, 2018). Wamalwa and James (2018), adds that there is a positive and significant relationship between project management practices as communication, financing, local community involvement and staff training on implementation of NGO projects. In this study project management practices will include, technological awareness, communication community participation and monitoring and feedback and their effect on project performance.

Monitoring and evaluation (M&E) is a continuous management function that assesses whether an investment plan, program or project (project/plan) and its activities are achieving expected results, identifying bottlenecks in implementation and highlighting any unintended (positive or negative) effects (Eric, 2016). Monitoring and evaluation give regular feedback on project performance highlighting any areas where additional resources affecting project performance are required. Chege and Bowa (2020); Ogolla and Moronge (2016) avers that each monitoring and evaluation factor studied

has an influence on project performance. Technology has evolved into a critical factor that influence project performance because it is critical for all operations in projects. Technology awareness includes the capacity to perceive and comprehend the value of technology in achieving project success (Pandey, et al., 2021). Communication is the process of exchanging information between people using a common set of symbols, signals or behaviours (Bates, 2014). Nyandongo and Davids (2020), notes that communication in its very nature is crucial to the success of a project. Community participation in development projects has greatly aided project performance through information sharing, resource contributions, collaborative decision-making, and project governance (Mbevi, 2016).

Project performance is typically assessed based on several dimensions and is driven by success factors (Cooke-Davies, 2002). Kariuki (2015) opines that the concept of project performance is being developed in many ways as criteria for evaluating success of projects. Maalim (2017) notes that project performance is a measure of how a project is successful in terms of its completion within schedule, cost and quality. Therefore, project deliverables based on project performance indicators remains key in delivering benefits to the stakeholders. Thus, measuring project performance is a critical factor in optimizing performance (Pitagorsky, 2013). Kariuki (2015); Albert, Balve and Spang (2017) avers that project performance is synonymous with project success. Project success criteria is indexed by the traditional iron triangle components of time, budget and scope with quality as a central theme which include the degree of importance of products to the base organization, results as perceived by all stakeholders, learning experience, motivation for future work, knowledge acquisition, final report preparation method and the way of project termination according to Andersen and Jessen (2000) cited in (Castro, Bahli, Barcaui & Figueiredo, 2020). In this regard, performance of aquaculture projects just like any other project is evaluated based on the iron three triangle.

Fish production continues to outpace the world population growth and aquaculture is the fastest growing food production system globally, with an average of 8.8% increase in production of animal products per year since 1985 (FAO, 2015). From its early development in Asia, aquaculture has undergone huge development and is today highly diversified (Mwamuye, Cherutich & Nyamu, 2012). Among the aquaculture production projects, Asia has been dominating in the world, with a proportion of 87.9% in 2018 an index of high performance (Suzuki, 2020). In a drive to enhance performance of aquaculture projects in EU, legislations were established to promote health, consumer protection and environmental sustainability standards by aquaculture activities (Marc Oswald., 2017).

Project performance is crucial to all stakeholders. Project failure is rated to be very high with about 50% of projects proven to have failed in Africa (Magagan, 2021). Besides, the African contribution to world aquaculture production is still insignificant (~2.7%), albeit significantly increasing with larger-scale investments in Nigeria, Ghana, Egypt, and Uganda producing substantial quantities of fish (Cai, Quagraine & Hishamunda, 2017). Despite these impressive gains, aquaculture projects still face serious challenges that, in some cases, undermine its ability to achieve sustainable outcomes. Thus, issues of poor performance of projects is not new and so is the frustration of project proponents who include stakeholders and beneficiaries (Ika, 2012). Despite commercial aquaculture being touted as the world's fastest expanding farming sector, South African aquaculture projects continues to perform poorly (Madibana, Fouche & Mnisi, 2020). Mwenesi (2015) revealed that the feed prices, survival rate and farm size have a significant effect on performance of Semi Intensive Tilapia Aquaculture (SITA) projects in Tanzania and therefore should be optimized in order to attain a profitable and sustainable SITA projects. Rukanda and Sigurgeirsson (2018) also notes that despite its potential and lengthy history, aquaculture's impact to the economy has been minimal in Tanzania. The aquaculture business in

Kenya is transitioning from traditional to modern technologies, but its projects are yet to reach its full potential (kmfri.co.ke. 2021).

Commercial Aquaculture in Kenya

The lakes are already showing some signs of qualitative overfishing where large individuals of most species are beginning to disappear from the catches. Production from aquaculture systems recorded a growth from 4,218 metric tonnes (MT) in 2006 to peak at 24,096 MT in 2014, representing 15% of total national fish production (SDF. 2014). According to KMFRI (2017), Kenya's annual production has reduced to about 128,000 Metric tons valued at about Kshs 21 million at the farm gate price and another Kshs. 1 billion in foreign currency earnings. This is derived from fresh water (81%), aquaculture (12%) and marine waters (7%). The drop in production especially in aquaculture was brought about by devolution of the agriculture sector to the counties, which has seen some counties not support aquaculture.

Consequently, the gap between national fish requirement and national fish production can only be met through fish farming (Achieng, 2021). Thus, commercial aquaculture is motivated by the fact that import of fish as an alternative at 5900 MT annually from other countries such as China, India, Pakistan, Japan, Korea and Uganda would be too expensive (SDF, 2014). The Kenyan aquaculture sector is characterized by three main productions systems of ponds (earthen, lined), tanks (concrete, PVC, plastics and cages (mainly low volume high density), each with different degrees of investment, management, intensification, commercialization and associated risks (Obwanga, et al., 2020). Ponds are mainly concentrated in the Central, Rift Valley and Western parts of the country, while tanks are in peri-urban areas and, for trout, in the highlands. Commercial cages are set up in the Kenyan part of Lake Victoria and in some water dams and reservoirs (Orina, et al., 2018).

Fisheries sector is at the center of the big four agenda and the vision 2030, which aims to achieve 100% food and nutrition security in the country. The

Government of Kenya has therefore commercialized fish farming in 15 counties following the signing of a Kshs. 15 billion Aquaculture Business Development Programme (ABDP) between the government and the International Fund for Agricultural Development (Alal, 2020).

According to sokodirectory.com., (2016) Due to lack of resources, the sector tends to be faced with numerous challenges including continuous use of old technologies, which hampers full development of the industry. Obwanga, et al. (2020) explored enabling factors for commercializing the aquaculture sector in Kenya. The study was conducted in the counties of Kiambu, Kakamega, Siaya, Nyeri and Kirinyaga. The enabling factors explored were income, fingerling production, fish feed, transport, market outlets, share of fishmeal consumed per household, risk-taking/aversion and trust in government. From the study findings, analyses showed that enabling factors differ substantially across the nine Counties. Besides, the study did not look at the monitoring and evaluation feedback, technology awareness, communication and community participation as enablers. However, the study focus was on the nine Counties, thus, limiting the applicability of the findings to Kisumu County. In this regard the current study will be designed to fill the existing gap in literature by investigating the influence of project management practices on performance of aquaculture business development projects in Kisumu County, Kenya.

Statement of the Problem

Aquaculture is at the center of the big four agenda and vision 2030 that aims to achieve 100% food and nutrition security in the Country (Munene, 2020). This is justified by the fact that aquaculture development is a seasoned pathway for poverty alleviation and target of development agencies. In addition, fish stocks from natural sources in Kenya have been declining, making aquaculture the only viable option to supplement fish supply. Besides, improvement of nutritional status of constituents, effective implementation of aquaculture projects give impetus to source of income generation and

employment opportunities, which are pillars of regional development. Thus, the State Department for Fisheries and the Blue Economy, took the initiative of implementing economic stimulus programs such as Aquaculture Business Development Projects to stem the imminent decline in fish farming (Muthoni, 2019). This necessitates the exploration of the effects of project management practices in maximizing on project performance

Despite this, Kenya's fisheries remain at their production limit at a time of rapid human population growth. This is evidenced by a sharp decline of 4,890 tonnes in fish production in 2012 and a further decline in 2013 and 2014. Pond-based aquaculture production registered depressed performance from 2014 to 2019, translating to lower fish consumption per capita of 4kg/person/year compared to global average of 20kg/person/year (Safina, Proscovia, Lewo & Akidiva, 2022). Otieno and Onyango (2022) adds that Kenya will have a shortfall of 360 million kilograms of fish within the next four years. This altogether denotes a status of poor performance of aquaculture projects in Kenya calling to question the efficacy of project management practices.

Project management practice can directly or indirectly influence project performance (Almeida, Figueiredo, Estevao-Beal & Uchoa-Passos, 2020). Besides there are limited studies conducted in the Kenyan context on the influence of project management practices and performance of aquaculture projects. In this regard the study filled the existing gap in literature by investigating the influence of project management practices on performance of aquaculture business development projects in Kisumu County, Kenya.

Purpose of the Study

The purpose of the study was to investigate the influence of project management practices on performance of aquaculture business development projects in Kisumu County, Kenya.

The study was guided by the following specific objectives

- To examine the influence of technological adoption on performance of aquaculture business development projects in Kisumu County, Kenya
- To assess the influence of communication on performance of aquaculture business development projects in Kisumu County, Kenya
- To evaluate the influence of community involvement on performance of aquaculture business development projects in Kisumu County, Kenya
- To determine the influence of monitoring and evaluation on performance of aquaculture business development projects in Kisumu County, Kenya

LITERATURE REVIEW

Technological adoption and project performance

According to Rahimah, NorAziati and Adnan (2018), the ability of an individual to be aware of and conscious of new and popular technology that has been obtaining widespread adoption throughout concerned industries or marketplaces is essential for project implementation and performance. In this regard, projects have been pushed to adopt modern technology to not only help with and augmentation of critical decision-making processes, but also to boost project implementation efficiency and effectiveness for optimal project performance. Thus, at the outset there is usually a clear and sensible rationale for adopting technology, based on benchmarking (Daryl & DeNardo, 2018). Therefore, project management software skills are of importance to project managers today as projects that operate under immense competitive business environment. Thus, when it comes to project management, technological adoption remains of great help. However, majority of empirical study on effect of technology adoption on project management has focused on results that public-sector project was born (Lundin & Lund, 2016).

Anjum (2018), Li, Sun, Li, Song and Ding (2022) and Olateru-Olagbegi, Obe and Jesuleye (2020) conducted studies on the effect of technology on project performance and found a positive and

significant effect. Githinji (2018) focused on the influence of technology on company's growth and profitability, which is a departure from the current study focusing on stakeholders satisfaction. Mmbughu (2015) investigated how to use ICT to improve project team effectiveness. Besides, in the Kenyan context there are limited studies focusing on the influence of technology adoption on project performance. Ivongo and Chege (2019) and Orina (2018) determined the influence of adoption of technology on project performance. However, these studies were not conducted amongst the aquaculture projects, thus limiting the generalization of findings. Besides, the sample size was too compromising on statistical power of findings. The low sample size may also lead to a type II error. That is, the null hypothesis is incorrectly accepted and no difference between the study groups is reported. These altogether provides a gap for the study to assess the influence of technological adoption on performance of aquaculture projects in Kisumu County, Kenya.

Communication and Project Performance

Project managers spend the bulk of their time communicating to coordinate efforts geared towards project success making communication the most crucial part of project management. This is justified by the argument of Nyandongo and Davids (2020) who noted that communication is a requisite to success and its ineffectualness a contributing factor to failure of many projects. Thus, without strong communication skills, project managers would find it incredibly difficult, if not impossible, to effectively manage their teams and coordinate efforts in order to bring about project's successful resolution (Shayna, 2020). However, empirical research on how communication affect performance of aquaculture projects is limited, including the best set of tools and techniques to be used for successful management of communication.

Communication is a requisite to success and its ineffectualness a contributing factor to the failure of many projects. Zulkifli (2021), Nyandongo and Davids (2020), Khanyile, Innocent and Justus (2019),

Sia (2019) and Mwajabu and Shukla (2017) studied communication management practices and project outcome. From the study findings, there was significant effect of communication management practices on project performance. However, the studies were conducted in non-Kenyan context limiting the generalization of findings to aquaculture project in Kenya. In the Kenyan context, Mugo (2018) established the influence of organizational communication on the implementation of building projects within Nairobi County. However, the study was conducted in construction industry limiting the applicability of findings of the study to aquaculture projects. Kibet, (2018) evaluated the effect of project communication patterns on project staff satisfaction in Uasin Gishu County funded projects, Kenya. However, the study did not focus on project performance as the dependent variable, but staff satisfaction. Odhiambo, et al. (2020) examined the effects of communication as a driver of performance of projects in Kenyan commercial banks. The study found that communication is a significant driver of performance of projects in Kenyan commercial banks. However, the study was conducted in the banking sector and not agricultural sector compromising its applicability to the performance of the aquaculture projects. The study sample size was low affecting the statistical power of the findings.

Community involvement and Project Performance

Community participation is a process that begins with informing, gathering input or involving the community in decision-making processes. Community participation includes all aspects of information, public awareness, outreach, input participation and collaboration (Barclay & Klotz, 2019). People in a community can be involved in projects to solve their own problems, which is a loose definition of community participation. People should be given the opportunity to 'participate' in projects that influence their lives, rather than being forced to do so. Participation of the community in project identification and planning has a significant positive impact on the project success (Ndungu & Karugu, 2019). However, most of the researchers

argue that community participation is workable on paper. Thus, it is hard to implement (Barclay & Klotz, 2019). Besides, Mbui (2018) supports participatory development by asserting that people require opportunities to participate in development projects designed for their benefit as this entrenches a sense of responsibility and ensures project sustainability.

People should be given the opportunity to 'participate' in projects that influence their lives, rather than being forced to do so. Kayijuka (2021) and Kaur, Chahal and Saini (2020) affirms a positive and significant effect of community participation on project performance. Despite this, Yusuf, Adekunmi and Ayanda (2020), notes that the number of projects completed had a strong but inverse connection with community participation and index of inconsistent results. In addition, these studies were not conducted in the Kenyan context. Locally, Ndungu and Karugu (2019), Mbui and Wanjohi (2018); Omondi, Odek and Siringi (2020) and Mbevi (2016) examined the influence of community participation on the performance of projects. The studies revealed that there is a significant relationship between community participation and performance. However, the studies did not focus aquaculture projects as focused by the current study.

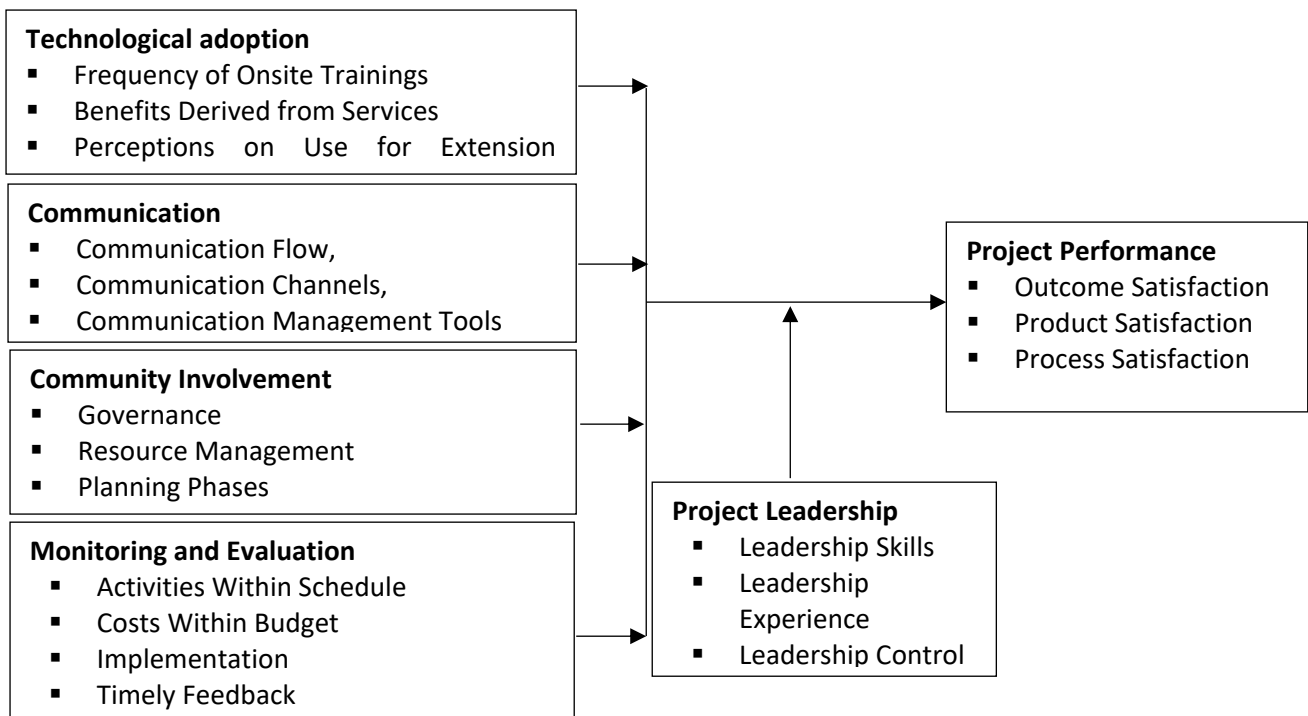
Monitoring and Evaluation and project performance

Monitoring and evaluation is a primary driving element in development programs (Singh, Chandurkar & Dutt, 2017). However, management should provide full support and completely participate in the monitoring and evaluation process, as this will assist them in making good and well-informed judgments. Chin (2012) notes that project performance is unresponsive to the level of information in project plans, but there is a substantial association between project monitoring, assessment techniques and project performance.

Masudi (2015), conducted a case study of UNFPA Rwanda's monitoring and evaluation methodology and project success. Both primary and secondary data were evaluated by Excel software. From the findings, M&E system is significantly related to project success. However, M&E in Rwanda remains a challenge. Despite this, the study was conducted in the context of Rwanda, limiting its generalization to the Kenyan context.

The goal of M&E is to establish whether or not a project objective has been met, as well as its efficiency, effectiveness and impact (Kusters, et al., 2018). However, very few organizations have faith in M&E partly because of its influence on project performance is not well understood (Hubert & Mulyungi, 2018). Besides, there is inadequate information on how key activities of M&E that include M&E planning, M&E training and baseline survey singularly and jointly influence project performance (Gamariel & David, 2021). Masudi (2015) and Niwagaba and Mulyungi (2018), conducted studies on monitoring and evaluation methodology and project success and found a significant relationship. However, the studies were not conducted in Kenyan aquaculture projects, limiting the generalization of findings. Besides, the studies had a low sample size undermine the internal and external validity of the study and low statistical power. Low statistical power undermines the purpose of a scientific research that reduces the chance of detecting a true effect. Chege and Bowa (2020), Okello (2021), Phiri (2015), Koima and Mukulu (2020), Kiruja (2015) and Omunga and Gitau (2019) determined the impact of monitoring and evaluation on project performance in the Kenyan context. However, the studies were not conducted amongst aquaculture projects focusing on planning, implementation and feedback system that provide a gap for the current study.

Conceptual Framework



Independent Variable

Moderating Variables

Dependent Variable

Figure 1: Conceptual Framework

METHODOLOGY

Research Design: This study adopted a descriptive research design that describes a population, situation or phenomenon under study (Mohajan, 2018). Descriptive research design uses surveys to gather data about varying subjects (Kumar, 2018). The descriptive research is an appropriate choice when the research aim is to identify characteristics, frequencies, trends and correlations. Therefore, using this design, the researcher was able to collect information on influence of project management practices on performance of aquaculture business development projects in Kisumu County, Kenya.

Target population: The target population consisted of aquaculture farmers, program assistant and extension officers. In this study, the accessible population was 435 aquaculture farmers, 2 program assistants, 2 monitoring, evaluation experts, and 4 extension officers of the 28 farming groups of Aquaculture Business Programme from Kisumu County in the four sub-counties of Nyakach, Nyando,

Kisumu West and Muhoroni. Aquaculture farmers and officers were targeted because they had information on aquaculture projects who could give feedback on causal relationship between the study variables for purposes of generalization.

Sample size: Sample size determination is the act of choosing the number of observations or replicates to be included in a statistical sample (Jordan, 2018). The sample size is an important feature of any empirical study in which the goal is to make inferences about a population. The study used the Krejcie and Morgan table (1970) to calculate sample size, which was 205 as per the table. The sample size was proportionately distributed according to Neyman's allocation formula (Shao, et al., 2021). The purpose of the method was to maximize survey precision, given a fixed sample size and reduce variance. With Neyman's allocation, the best sample size for strata h was:

$$n_h = \left(\frac{N_h}{N} \right) n \dots \dots \dots \text{Eqn 1}$$

Where,
 n_h - The sample size for strata h , n - Total sample size,

N_h - The population size for strata h , N - The total population
Hence, distribution will be as follows

Table 1: Sample Size of Aquaculture farmers

Sub-county	Target Population	Sample Size
Nyakach	95	45
Nyando	122	57
Kisumu West	101	48
Muhoroni	117	55
Total	435	205

Source (State Department of Fisheries, Department of Aquaculture, 2021)

Census was used to select the 2 program assistants, 2 monitoring and evaluation experts and 4 extension officers of Aquaculture Business Development Programme from Kisumu County. This brought the total sample size to **213**.

Data Collection Instruments: The study adopted questionnaire as the main instrument for collecting primary data from the aquaculture farmers. The questionnaire included open-ended questions as well as items with a 5-point Likert Scale, which is commonly used in social sciences to assess perceptions, attitudes, values, and behavior (Mugenda & Mugenda, 2008). Interview offered the researcher with a platform to prompt the participants and obtain data in the desired detail.

Data Processing and Analysis: The questionnaires were edited and coded to improve the quality of data. Data was analyzed using descriptive (mean, standard deviation, frequencies, skewness and kurtosis) and Inferential Statistical Techniques. Under inferential statistics techniques, multiple regressions was used to determine the effect of a set of independent variables (project management practices) and dependent variable (performance of aquaculture project) and coefficient of correlation using the Statistical Package for Social Sciences (SPSS) version 25.0.

The regression model was as follows:

$$y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \epsilon \dots \dots \dots$$

Equation 2

Where y was performance Aquaculture Business Development Project, which was the dependent variable, X was project management practices and β was the standardized regression coefficient.

- X_1 represent technological adoption
- X_2 represent communication
- X_3 represent community involvement
- X_4 represent monitoring and evaluation

Quantitative data was extracted from the questionnaires by use of frequency tables and the data from interviews was analyzed based on themes and sub-themes.

RESULTS AND DISCUSSION

The influence of project management practices on performance of aquaculture business development projects.

As shown in Table 2, Cumulatively, the four project management practices in this study accounted for $R^2 = 0.721$ which is 72.1% of the variance in project performance. According to Falk and Miller (1992), value of at least 0.10 or 10% for the variance explained is acceptable. Hence, following this rule of thumb, criteria, our proposed model has demonstrated an acceptable level of R-squared values

Table 2: Model Summary

Model	R	R Square	Adjusted Square	R Std. Error of the Estimate	R Square Change
1	.849 ^a	.721	.714	.278	.721

- a. Predictors: (Constant), M& E, Communication, Community Involvement, Technology adoption
 b. Dependent Variable: Project Performance

Table 3 revealed that the F-value of 103.52 and a p-value of 0.00 significant at 5% level of confidence indicate that the overall regression model is significant; hence, the joint contribution of the independent variables was significant in predicting project performance is likely to improve. In this

regard, the research question was answered that that there is a significant influence of project management practices on performance of aquaculture business development projects in Kisumu County, Kenya.

Table 3: ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	32.035	4	8.009	103.532	.000 ^b
	Residual	12.377	160	.077		
	Total	44.412	164			

- a. Dependent Variable: Project Performance
 b. Predictors: (Constant), M& E, Communication, Community Involvement, Technology adoption

Table 4: Regression coefficients of project management practices on performance of aquaculture business development projects

Model		Unstandardized Coefficients		Standardized Coefficients		Collinearity Statistics		
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	.452	.210		2.153	.033		
	Technology	.471	.057	.511	8.281	.000	.457	2.186
	Communication	.094	.045	.103	2.060	.041	.697	1.434
	Comm Involv	.180	.040	.245	4.464	.000	.580	1.724
	M & E	.217	.038	.249	5.689	.000	.909	1.100

- a. Dependent Variable: Project Performance

The first objective was to examine the influence of technological adoption on performance of aquaculture business development projects in Kisumu County, Kenya. Projects have been pushed to adopt modern technology to not only help with and augmentation of critical decision-making processes, but also to boost project implementation efficiency

and effectiveness for optimal project performance. Thus, at the outset there is usually a clear and sensible rationale for adopting technology, based on benchmarking (Daryl & DeNardo, 2018). Thus, when it comes to project management, technological adoption enhances project performance interms of realization of the project goals. From the findings in

Table 4 technological adoption had coefficients of estimate which were significant basing on $\beta_1 = 0.471$ ($t = 8.281$; p -value = 0.000 which is less than $\alpha = 0.05$). This suggests that there is up to 0.471 unit increase in on performance of aquaculture business development projects for each unit increase in technological adoption. The study concludes that technological adoption has a positive and significant effect on performance of aquaculture business development projects. These findings are in line with the findings of Li, et al (2022), Olateru-Olagbegi, Obe and Jesuleye (2020) and Anjum (2018), who found a positive and significant effect of technological adoption on project performance. This is in line with the systems theory. This is explained by the fact that different segments of the aquaculture projects just like any other system act in regulated ways to produce a certain result which calls for the adoption of technology. There are multiple tools and processes built into a technological system to ensure that they produce the desired results in projects (Jagoda & Samaranayake, 2017). This implies that the aquaculture projects should adopt technology in their operations to optimize their performance.

The second objective was to assess the influence of communication on performance of aquaculture business development projects in Kisumu County, Kenya. Communication is an important component in project management, allowing projects to progress smoothly and on time. Communication ensures team members are aligned on project goals and understand exactly what's expected of them thus project performance (Pilkington, 2021). From the study findings communication has a positive and significant effect on performance of aquaculture business development projects on $\beta_2 = 0.094$ ($t = 2.060$; p -value = 0.000 which is less than $\alpha = 0.05$). This suggests that there is up to 0.091 unit increase on performance of aquaculture business development projects for each unit increase in communication. Besides communication significantly affects the performance of aquaculture business development projects. These findings are in line with Zulkifli (2021), Nyandongo and Davids

(2020), Mwajabu and Shukla (2017), who found that there was a strong positive relationship between communication and project outcomes. These findings are premised on the systems theory which views communication as a system binder, crucial for the performance of a project. Therefore, through communication the aquaculture project activities can be coordinated and for effective implementation to guarantee heightened project performance. This mandates the management of aquaculture projects to embrace effective communication strategies as a means of enhancing project performance.

The third objective was to find out the influence of community involvement on performance of aquaculture business development projects in Kisumu County, Kenya.

Community involvement promotes sustainable decisions by recognizing and communicating the needs and interests of all participants including decision makers. Community involvement increases acceptance of decisions and community commitment to outcomes of the project (Wu & Gong, 2021). The study findings showed that community involvement had coefficients of estimate which was significant basing on $\beta_3 = 0.217$ ($t = 4.464$; p -value = 0.000 which is less than $\alpha = 0.05$) implying that the community involvement has a statistically significant effect on performance of aquaculture business development projects. The implication is that there is up to 0.217 unit increase in on performance of aquaculture business development projects. These finding is supported by the stakeholder's theory. Therefore, the aquaculture projects team should strive to involve the community as means of inclusively meeting the needs of all the stakeholders.

The fourth objective was to determine the influence of monitoring and evaluation on performance of aquaculture business development projects in Kisumu County, Kenya. Monitoring and Evaluation (M&E) is a continuous management function to assess if progress is made in achieving expected results, to spot bottlenecks in implementation and to highlight whether there are

any unintended effects (positive or negative) from an investment plan, programme or project ("project/plan") and its activities (www.fao.org., 2023). Therefore, through monitoring and evaluation the projects are bound to remain on track hence realizing its predetermined goals thus heightened performance. This is corroborated by the findings of the study that monitoring and evaluation has a positive and significant effect on performance of aquaculture business development projects basing on $\beta_4 = 0.157$ ($t = 5.689$; $p\text{-value} = 0.001$ which is less than $\alpha = 0.05$). This suggests that there is up to 0.157 unit increase in performance of aquaculture business development projects, for each unit increase in monitoring and evaluation. This findings were supported by Chege and Bowa (2020) Niwagaba and Mulyungi (2018); Masudi (2015), who established that the strength of M&E team was a useful predictor of project performance. These findings were based on the stakeholders theory. The interest of M&E must be in consonance with the expectations of the stakeholders of the aquaculture projects for heightened performance.

Recommendations

The management of the aquaculture business development projects should bundle all the project management practices as technological adoption, communication, community involvement and monitoring and evaluation through their policy framework to realize high results in terms of performance. Aquaculture projects should adopt technology in their operations to optimize their

performance. The aquaculture projects need to strengthen pre- and post-harvest technology adopted by stakeholders for high performance of aquaculture business development projects. There is need for awareness creation and training amongst the aquaculture business development projects to strengthen a positive attitude towards adoption of pre- and post-harvest technology.

The management of aquaculture projects should embrace effective communication strategies as a means of enhancing project performance. The communication tools should be consistently updated as the aquaculture business development projects progresses. The channel of communication should be effective in regular provision and retrieval of information to farmers on time. Aquaculture business development projects team should strive to involve the community as means of inclusively meeting the needs of all the stakeholders. All the fish farmers should be regularly invited for meetings to discuss project progress and consistently be involved on decision making on matters pertaining to the aquaculture projects. The interest of M&E should be in line with the expectations of the stakeholders of the aquaculture projects for heightened performance. M& E activities should be predetermined during the planning phase and promptly implemented and accurately act on the feedback. Further research should focus on other project management practices and how they affect performance of aquaculture projects in other regions.

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