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Effects of monitoring and evaluation planning on implementation of poverty alleviation mariculture projects in the coast of Kenya

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ABSTRACT

Mariculture was introduced in Kenya in 1980s to provide economic opportunities to coastal communities and address the widespread poverty and livelihood needs with varying degrees of success and failures. A cross sectional survey was undertaken in Kwale, Mombasa and Kilifi Counties of the coast of Kenya. The study aimed at assessing the effects of monitoring and evaluation planning on implementation of poverty alleviation mariculture projects with focus on examining the effect of timeliness, tracking progress, periodic reporting, mid-term evaluation and end of project evaluation on implementation of poverty alleviation mariculture projects in the coast of Kenya. The study involved the application of factor analysis, correlation analysis and regression analysis. Factor analysis revealed that outcome effectiveness was the main measure of implementation of poverty alleviation mariculture projects while tracking progress and timeliness were the main measures of monitoring and evaluation planning. A correlation analysis showed a strong positive relationship between outcome effectiveness and tracking progress and timeliness ($r = 0.693$ and $r = 0.723$, $p = 0.001$, respectively). Regression analysis confirmed that timeliness and tracking progress had significant positive relationship with outcome effectiveness ($\beta = 0.538$, $t = 12.058$ and $\beta = 0.491$, $t = 10.993$, $p < 0.0005$, respectively); where, β = standardized beta value, p = the probability of obtaining results as extreme as the observed results of a statistical hypothesis test, assuming that the null hypothesis is correct. This means there was a significant positive relationship between monitoring and evaluation planning and mariculture project implementation.

1. Introduction

Development of mariculture as a source of livelihood, employment and income for the rural communities in many developing countries has remained low particularly in Africa, where it accounts for only five percent of the production of farmed aquatic organisms [1]. Past mariculture development initiatives in Africa failed to achieve sustainable increases in production [2] due to several setbacks, including low output and high cost of production [3]. This is different from the situation in South East Asia where mariculture makes significant contribution to the local economies [4].

In Kenya, mariculture was introduced three and half decades ago [5], to provide economic opportunities to coastal communities in order to bring about development in the rural coastal areas [6]. It was initiated in Kenya through research, development and conservation projects [7,8] to address the widespread poverty and livelihood needs with varying degrees of successes and failures [4,9]. The main culture species in mariculture in Kenya include milk fish, mullets, mud crabs, seaweeds, oyster and prawns [7,8,10,11]. The mariculture projects involve production systems operated by self-help groups that consist mainly of female farmers because the males are engaged in artisanal fishing [6].

Prawn culture began in the mid 1980s at Ngomeni in Kilifi County with large scale demonstration ponds established through funding from the Food and Agriculture Organization of the United Nations (FAO) to support development of mariculture [8,9,12–14]. Mud crab fattening was later introduced in the coast of Kenya in the late 1990s as a strategy to support mangrove conservation, and provide food and income to the local communities [8,15–17]. It first began by collecting sub-adult crabs and fattening them to market size (>0.5 kg) in drive-in cages and pens established in mangrove forests [7,16–18]. This has since changed and

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presently juvenile crabs are grown in earthen ponds and plastic cages to attain market size [19]. Seaweed farming was established on an experimental scale in the early 2000s in the south coast of Kenya with *Eucheuma denticulatum* and *Kappaphycus alvarezii* being the main commercial species farmed. Seaweed farming is mainly carried out by women and employs about 100–400 farmers [10]. Unfortunately, some of the mariculture projects including the prawn culture at Ngomeni and oyster farming at Gazi Bay collapsed despite having financial resources that were set aside for their implementation [9,12]. Other mariculture projects such as mud crab farming that began in the late 1990s [8] have stagnated at the pilot stage for many years but the causes of their stagnation have not been established. In the year 2009, the Government of Kenya initiated an Economic Stimulus Programme to establish a vibrant aquaculture industry but the Stimulus Programme did not support mariculture since it mainly focussed on freshwater aquaculture [9].

Implementation of projects, including mariculture is considered successful on the basis of four criteria: whether the project is executed within the planned timeframe, whether the project is carried out within the budget, whether the project achieves all the goals that were originally set for it, and whether the project satisfies the target beneficiaries [20]. These four criteria are used to define variables used to measure the success of project implementation. In this study, mariculture project implementation consisted of three sub-variables namely, level of implementation, satisfaction which is associated with degree of project success, and effectiveness which relates to the degree to which the project has realized the intended objective. Project implementation involves the actual implementation of the project activities as documented in the approved project document [21,22]. The collapse and stagnation of the mariculture projects along the coast of Kenya raise questions regarding whether they were properly designed and appropriate monitoring and evaluation (M&E) plan put in place. According to Ika et al. [23]; effective monitoring is a key factor in international development projects that are funded by World Bank. It is necessary to build M&E into the design of a mariculture project and to allocate resources for it from the start [24]. The M&E is about comparing what was originally planned with what actually happens in order to track progress on activities, outputs, outcomes and impacts. In this study, the five components of monitoring and evaluation system planning namely timeliness, tracking progress, periodic reporting, mid-term evaluation and end of project evaluation [25]were considered as the main variables.

Monitoring is a continuous process that aims primarily to provide the project stakeholders with early indications of the quality, quantity and timeliness of progress towards delivering intended results [21]. Monitoring and evaluation targets should be realistic and pragmatic [26]. It helps to identify trends and patterns [27] that allow timely decision-making so that successes are consolidated and mistakes are corrected [28]. There are three types of monitoring that were addressed in the poverty alleviation mariculture projects namely implementation monitoring, impact monitoring, and reporting. These types of monitoring take place at different levels of the logical framework and serve different functions. Implementation monitoring tracks project operations including activities and outputs to ensure that implementation is on track. Impact monitoring focuses on the immediate objectives. Reporting on the other hand concerns the preparation and submission of periodic reports to the stakeholders, particularly donors [25]. Both monitoring and reporting provide information for evaluation. Evaluation is a time-bound exercise that systematically and objectively assesses the relevance, performance and success of on-going and completed programmes or projects at selected stages [28].

To date, there is limited information on the causes of stagnation or collapse of the mariculture projects that were established to alleviate poverty among the coastal communities in Kenya [24]. In particular, it is not clear whether monitoring and evaluation planning can be applied to improve the performance of poverty alleviation mariculture projects [24]. This study aimed at providing an understanding of the effects of monitoring and evaluation planning on implementation of mariculture projects by assessing and analyzing how the various monitoring and evaluation components can lead to success or failure of mariculture projects. The information generated from this research will inform policy decisions in order to prevent frequent failures of mariculture projects and increase the contribution of mariculture to poverty alleviation, provision of livelihood and income to the coastal communities in Kenya.

2. Materials and methods

2.1. The research design

In the present study, a cross sectional survey design was adopted with questions being asked once in the entire period of study. Cross sectional studies are suitable where the objective is to establish whether significant relationships exist among the study variables at some point in time [29,30]. Adoption of a cross sectional survey further made it possible to collect data in short duration of time. Some limitations of cross sectional studies have been identified to include cohort differences, potential reporting biases associated with non-response and difficulty in making causal inference. However, these have been addressed through sampling technique and data collection procedure adopted by the study. Survey method was used in this study because it has been successfully used in similar studies [23,31]; it is one of the most important research methods in the social sciences and is used extensively to collect information on numerous subjects of research [32]. In the present study, the target population covered the communities that are engaged in fish, mud crab, prawn, artemia and seaweed farming in Kwale, Mombasa and Kilifi Counties of the coast of Kenya because these counties have existing or collapsed mariculture initiatives. The other three counties in the Kenyan coast namely Taita Taveta, Tana River and Lamu Counties do not have mariculture initiatives. These communities consist of 12 organized community groups with a total of 372 members [33] undertaking 12 mariculture projects. These 12 projects consist of a mud crab culture project, a milkfish culture project, a prawn culture project, an artemia culture project, two (2) seaweed farming projects and six (6) milkfish and/prawn polyculture projects (Table 1). The organized community groups were either formed by Non Governmental Organizations (NGOs) to specifically implement mariculture projects (as part of environmental conservation or for livelihood), or formed by communities themselves being influenced by their neighbors that had benefitted from group formations.

2.2. Sample size and sampling technique

In the present study, a sample was selected from a sampling frame that consisted of a complete listing of 372 individual members of the organized community groups. The sample size was calculated using the following standard formula for infinite population [34,35]:

$$n = z^2p(1- p)/e^2$$

Where n is the sample size, z is the statistical certainty chosen at 95% confidence level (z = 1.96) for an error risk of 5%, p is estimated level/coverage to be investigated, chosen at p = 0.5, e is precision desired, expressed as a fraction of 1, usually e is 0.05 chosen for the confidence interval. The output was corrected for finite population using the following formula [35]:

$$n^1 = n / (1 + n / N)$$

where n^1 is the sample size for finite population, N is the target population of 372 and n is the calculated sample size from infinite population of 384. A sampling interval (SI) of two was calculated by dividing the total population by the sample size ($n^1 = 189$).

The simple random sampling was used to select the number of subjects that represent the target population in the survey. The respondents

Table 1
Distribution of the sample sizes by mariculture groups and type of mariculture projects along the Kenya coast.

S. No.	County	Name of mariculture group	Type of mariculture project	No. of members	Source of funding	Sample size (proportion x 189)
1	Kilifi	Dabaso Conservation Group	Mud crab culture	28	Donor	15
2		Umoja Self Help Group	Milkfish and prawn culture	83	Government	42
3		Abent Conservation Group	Milkfish and prawn culture	17	Government	9
4		Ihaleni Conservation	Milkfish, prawn and crab culture	24	Donor	12
5		KadzuoniArtemia Society	Artemia culture	25	Government	13
6		Ngomeni Conservation	Prawn culture	22	Government	11
7	Mombasa	Majaoni Youth Development Group	Milkfish and prawn culture	27	Government	12
8		Kidongo Beach Management Unit	Milkfish and prawn culture	25	Donor	13
9		Makumba Self Help Group	Milkfish and prawn culture	37	Donor	19
10	Kwale	Baraka Self Help Group, Makongeni	Milkfish culture	22	Government	11
11		Kibuyuni Seaweed Farmers	Seaweed farming	49	Government and donor	25
12		Stahimili Women Group, Gazi	Seaweedfarming	13	Government and donor	7
	TOTAL			372		189

were randomly picked from the sampling frame using random numbers to ensure that there were equal chances for each member of the target population to be included in the study [36]. This sampling technique generated a representative sample that allows generalization to a larger population and the usage of inferential statistics. Table 1 below shows the distribution of sample size across the 12 mariculture groups and type of mariculture projects undertaken by each group.

2.3. Data collection instruments and procedures

In this study, the questionnaire, a tool that consisted of a number of questions arranged in a definite order on a form that was administered to the respondents was the main research instrument. The questionnaire was constructed taking into account the objectives of the research [37,71]. The questionnaire consisted of two parts with part 1 having both closed and open ended questions on demographic and contextual factors, and part 2 having Likert scale type of questions on the main variables in the study; implementation of poverty alleviation mariculture projects and monitoring and evaluation planning. Each question in part 2 was assessed on a 5-point Likert scale from strongly disagree (1) to strongly agree (5) [38]. Monitoring and evaluation planning was measured on ordinal scale making use of the Likert scale items in a questionnaire that covered timeliness, progress tracking, periodic reporting to the main stakeholders, mid-term evaluation and end of project evaluation. The measurements focussed on delivery of the project in terms of time, progress in the realization of outputs, frequency of reporting to stakeholders, use of data and information for decision making, impact of the mariculture project in terms of poverty alleviation and the relevance of mariculture projects. Progress indicators were measured by confirming the presence of a system of measuring and recording the achievement of objectives particularly generation of income and level of satisfaction. Project implementation was measured on ordinal scale using the Likert scale items in a questionnaire that covered the level of implementation, degree of success and degree to which the project has addressed the objective of poverty alleviation. Level of implementation was measured by availability of employment opportunities created by each of the mariculture projects. Degree of success was measured by exploring the level of satisfaction by beneficiaries while degree to which the project has addressed poverty was measured capturing changes in livelihoods, nutrition and food security.

A pilot study was carried out to evaluate the suitability of the questionnaires. The pilot study was conducted with fifteen (15) respondents at Junda along Tudor Creek in Mombasa with a mariculture group, which was not part of the target groups. The pilot study helped to detect flaws in the administration of the questionnaires and therefore helped ensure reliability and validity of the questionnaires [31,38]. Reliability of the questionnaires was evaluated using the Cronbach's Alpha, which was computed to be 0.978. According to DeVellis [39]; a computed Cronbach's Alpha of 0.70 is considered sufficient for research instrument hence the questionnaire that was used in this study was above the required threshold and therefore reliable. Content validity was considered through a subjective assessment of the questionnaires' appropriateness and the extent to which the questionnaire captured the variables and indicators from the objectives of the study that needed to be measured [24].

Guided questionnaire administration was adopted in this study since it provided the opportunity to capture a representative sample of the target population and control for non-verbal behaviour [32]. The questionnaire was administered in the mariculture farms and respondent's houses over a period of six months between June and December 2016. The researchers followed up the target respondents, whose names had been pre-selected through random numbers and booked appointments with them in advance via phone calls and conducted guided administration of questionnaires to avoid potential non-response bias. To ensure accuracy in reporting, each respondent was informed that their personal details would remain anonymous and confidential. The overall purpose and objectives of the study were clearly explained to them and informed consent obtained with a clarification that the questionnaire was to be filled on voluntary grounds. A total of 182 respondents answered the questionnaires against an estimated sample size of 189 respondents. This resulted in a response rate of 96.3% which is considered excellent based on recommendations of Mugenda and Mugenda [29,30]; Babbie [40] and Zikmund et al. [41]; that a response rate of 70% and above is very good for analysis and enhances validity of the results.

2.4. Data analysis

Descriptive statistics particularly mean and frequencies were computed to determine key characteristics of the demographic and other factors. An exploratory factor analysis was performed on project implementation and monitoring and evaluation planning variables to identify patterns in data, reduce the data table and number of variables for ease of interpretation according to Cattel [42]; Gorsuch [43]; Nunnally and Bernstein [44]; Pett, Lackey and Sulivan [45]. The necessary tests which involved checking the correlation matrix for evidence of correlation coefficients greater than 0.3, computing Kaiser-Meyer-Olkin Measure of Sampling Adequacy which is required to be above 0.6 [46,47], and the Bartlett's Test of Sphericity value required to be significant with $p \leq 0.05$ [48], were carried out to confirm the suitability of the dataset for factor analysis. After conducting the necessary tests, factor analysis was conducted using principal components as the main factor extraction technique [69]. The analysis of principal component involved using the Kaiser's criterion, scree plot and parallel analysis to determine the number of components to retain [70]. The rotated factor solutions were generated using direct oblimin rotation, which is an oblique rotation, for interpretation. The scale in the rotated solutions was refined by removing items with low communality values after fixing the number of components retained. Low communality values particularly a value less than 0.3 could suggest that the item does not fit well with the

other items in its component. The component correlation matrices were generated alongside direct oblimin rotations to estimate the correlation coefficient (r). A descriptive analysis of the identified factors in the reduced component matrix for project implementation and pattern matrix for monitoring and evaluation planning was undertaken by estimating the mean and testing the reliability of the scales of each factor using Cronbach's alpha. The Pearson's correlation analysis was carried out to determine the nature and strength of the relationships between the independent variables (Monitoring and evaluation planning) and the dependent variable (implementation of poverty alleviation mariculture projects). The Statistical Package for Social Scientists (SPSS) version 22.0 was used for data analysis.

A regression analysis was carried out according to Christensen [3]; Nachmias and Nachmias [32] and Tabachnick and Fidell [49] according to the following equation:

$$Y = A + \beta_1 X_1 + \beta_2 X_2 + \ldots \beta i Xi$$

where independent variables (Xi) were: timeliness, progress tracking, periodic reporting to the main stakeholders, mid-term evaluation and end of project evaluation, dependent variable (Y) was: outcome effectiveness (implementation of poverty alleviation mariculture projects), A was the Y intercept (the value Y when all the X values are zero), and β_i were the regression coefficients.

The R Square was estimated to establish how much of the variation in the dependent variable (implementation of poverty alleviation mariculture projects) was explained by the model.

3. Results and discussion

3.1. Demographic characteristics and other factors

The demographic characteristics and other factors are summarized in Table 2. In terms of sex composition, the mariculture groups consisted of 59% female members and 41% male members. This information is critical towards adapting monitoring and evaluation planning programmes to meet the needs of female and male members of the mariculture groups, including suitable times based on gender roles in a community, in order to improve outcomes from implementation of poverty alleviation mariculture projects. The findings confirmed the observations by Luxton & Luxton [50] and UNEP-Nairobi Convention and WIOMSA [51] that women were involved in seaweed mariculture as the main beneficiaries of production in the Line Islands, Central Pacific and in Zanzibar, respectively.

The study further found that 74% of the members of the mariculture groups were aged 19–50 years. On average, 55% of the mariculture project personnel were aged between 31 years and 50 years old hence indicating that poverty alleviation mariculture projects are run by workers in active middle age category when they could undertake the hard work in the mariculture farms. This is consistent with the findings of Dey et al. [52] and Ng et al. [53] that the average age of aquaculture farmers (including mariculture farmers) in Malaysia were in the age of 38 years–50 years, which was considered the most productive age in terms of capital and energy to work optimally. A study by Samah and Kamaruddin [54] also revealed that age had a significant positive relationship with the level of good aquaculture practices in Malaysia; with older farmers exercising good aquaculture practices than younger farmers.

Table 2
Demographic characteristics and other factors.

Demographic characteristics	N	Status	Status
Sex	182	Female: 59%	Male: 41%
Age	182	Mean: 40 years	Minimum: 19 years Maximum: over 50 years
Level of education	182	Primary: 86%	Secondary and above: 14%
Employment status	182	Unemployed: 93%	Employed: 7%
Relevant training	182	No training: 17%	Some training obtained: 83%
Other factors			
Source of seed for mariculture	182	From the wild: 92%	From hatchery: 8%
Availability of feed for mariculture	182	Available: 83%	Not available: 17%

The results also showed that 86% of the members of mariculture groups had attained different levels of primary education and were therefore able to read and write. This implies that poverty alleviation mariculture projects were run by workers who had low levels of education. Education is critical in accurate reporting to stakeholders and adoption of monitoring and evaluation planning in the implementation of poverty alleviation mariculture projects. The low level of education therefore causes concern. However, low levels of education particularly among women who were involved in mariculture had also been observed in South East Asia, where women had assumed a critical role in aquaculture development [55,56]. Hurtado-Ponce et al. [57] observed that most of the seaweed planters in Panagatan Cays, Caluya and Antique in Philippines, had not finished primary education. While most of the work in mariculture along the coast of Kenya was manual and did not require high academic and professional qualifications, some critical decisions were made at different levels and such decisions often required some higher levels of education which was lacking. Further, Studies by Rahm and Huffman [58] and Saha et al. [59] concluded that level of education attained by farmers influences their technology adoption decisions. Studies by Ifijika et al. [60] and Ali et al. [61] also concluded that education can influence modernization of fish farming techniques by enabling farmers to understand new developments in fish farming technology.

The study showed that about 93% of respondents were unemployed. This means that they were available to work in the mariculture projects. People who are employed elsewhere do not have time to participate fully in implementation of mariculture projects. Such people are therefore less likely to engage effectively in monitoring and evaluation planning which is essential for the success and sustainability of poverty alleviation mariculture projects. A study by Hurtado-Ponce et al. [57] also found that majority of seaweed farmers in Panagatan, Caluya and Antique in the Philippines were formerly crop farmers or fishermen in their original places of residence, who shifted to seaweed mariculture as a livelihood. Previous experience by members of the mariculture groups was also investigated because it endowed people with the necessary capacity and awareness of the working procedures that are essential for effective implementation of mariculture projects. The study found that about 62% of members of mariculture groups did not have any previous experience in mariculture. This implies that most of the people who were involved in the poverty alleviation mariculture projects were not endowed with the experience necessary for effective implementation of mariculture projects. A study by Salau et al. [62] also found that farmers who had little experience were less proficient in management of aquaculture farms.

Regarding training, the study established that 81% of the respondents had obtained some training on mariculture while 19% lacked any training. This implies that the nature of work that they performed in mariculture as well as tasks assigned to each member of a mariculture group required skills that could be built through training. It also influences the ability of community-mariculture groups to adopt monitoring and evaluation planning to improve the outcomes of implementation of poverty alleviation mariculture projects given the same exposure and context in mariculture projects. It further confirmed the findings of Mirera et al. [17] that groups which had little training in mud crab mariculture experienced higher mortalities of crabs in their culture systems due to poor handling, poor construction of culture

structures, inadequate feeding and feeding at wrong times. People should therefore be adequately trained before they are given technical tasks to perform in mariculture enterprises. Training has also been recognized as a critical success factor for international development projects [23] and should therefore be factored in the design of mariculture projects to ensure that the right quality of labour is provided for the mariculture project implementation.

Regarding sources of seed for mariculture, about 92% of the respondents observed that they obtained seed from the wild. This was attributed to the fact that no marine fish hatchery has been established in Kwale, Mombasa and Kilifi Counties and therefore the community based poverty alleviation mariculture projects thrived on seed collected from the wild whose sustainability and reliability of supply was not guaranteed. The scope for expansion of community based mariculture projects therefore remained limited until hatcheries are established. A study by Edwards [63] established that local seed production is essential and can enhance poverty reduction by reducing cost, improving the quality of seed, and providing employment and income at local level.

Source of feed for the mariculture projects was investigated since fish feed is an important input in any mariculture project. About 83% of the respondents observed that feed was available, with 58% of the respondents stating that it was available seasonally, 25% stating that it was readily available throughout the year, and 17% were not sure. The findings were in agreement with studies by Hishamunda et al. [64] which indicated that shortage and price of good quality feed was a constraint to further development of aquaculture including mariculture in Southeast Asia. Studies by Mirera et al. [17]; Mirera and Samoilys [4] and Mirera and Ngugi [6] also indicated that the poverty alleviation mariculture projects involved small scale production systems using locally available feeds because the commercial fish feeds were costly and not used by small-scale mariculture enterprises.

3.2. Factor analysis of mariculture project implementation

The original principal component analysis (PCA) showed that the first two components had eigenvalues greater than one (1) hence meeting the eigenvalue rule and explained a total of 75.8% of the variance (Table 3). However, results of a scree plot of the eigenvalues plotted against their principal components showed that there was only one major factor with a clear break occurring after the first component (Fig. 1). The results of parallel analysis also indicated that only one component from PCA results had an eigenvalue which was above the corresponding criterion values for a randomly generated data matrix of the same size (Table 3). The unrotated factor loadings (Appendix A), shows that most of the items load quite strongly (above 0.4) on the first

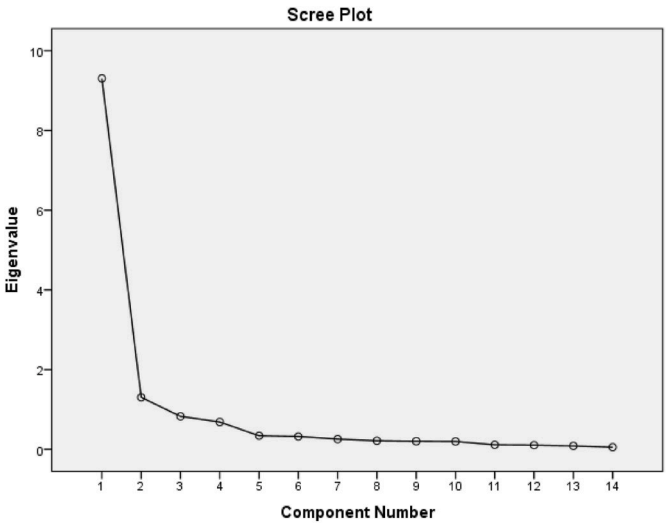

Fig. 1. Original scree plot for implementation of poverty alleviation mariculture projects.

one component and very few items load on component 2. This further suggests that a one factor solution is most appropriate. After removing 5 variables that loaded strongly on more than one component, only one factor was extracted accounting for 65.9% of the variance in project implementation. A direct oblimin rotation was attempted on the dependent variable and reduced component matrix was obtained with only one component remaining thereby validating the results of a scree plot and parallel analysis. Since only one component remained in the final extraction, the solution could not be rotated and the reduced component matrix was adopted (Table 4). The results therefore demonstrate that there was only one major factor driving implementation of poverty alleviation mariculture projects.

The main loadings in the single factor (Table 4) were from items on employment, satisfaction, livelihoods and food security, all of which contributed to the objective of poverty alleviation. Employment, satisfaction, livelihoods and food security have been combined to form outcome effectiveness. The single factor was therefore named outcome effectiveness which refers to how much the poverty alleviation mariculture projects meet the intended objectives. Therefore outcome effectiveness formed the main measure of implementation of poverty alleviation mariculture projects along the coast of Kenya. The findings

Table 3
Comparison of initial eigenvalues from PCA and criterion values from parallel analysis.

Component number (A)	Initial Eigenvalues (from PCA)			Criterion value from parallel analysis (E)	Decision (B > E)
	Total (B)	% of Variance (C)	Cumulative %(D)		
1	9.307	66.481	66.481	1.4798	**Accept**
2	1.304	9.311	75.793	1.3781	Reject
3	.826	5.898	81.690	1.2809	Reject
4	.684	4.884	86.575	1.2094	Reject
5	.339	2.421	88.996	1.1360	Reject
6	.320	2.287	91.283	1.0676	Reject
7	.256	1.825	93.108	1.0058	Reject
8	.214	1.530	94.638	0.9538	Reject
9	.201	1.437	96.075	0.8930	Reject
10	.196	1.400	97.476	0.8323	Reject
11	.112	.803	98.278	0.7809	Reject
12	.103	.738	99.017	0.7252	Reject
13	.085	.608	99.625	0.6640	Reject
14	.053	.375	100.000	0.5931	Reject

Table 4
Reduced component matrix for principal component analysis solution of project implementation items.

Opinion Statement	Effectiveness	Communalities
1. The mariculture allows beneficiaries to have employment	0.754	0.569
2. The mariculture enables beneficiaries to gain self employment	0.844	0.712
3. The mariculture greatly assists both men and women to have employment opportunities	0.778	0.606
4. The mariculturehas organized market channels that increase the level of satisfaction by beneficiaries	0.871	0.759
5. The mariculture provides quality service that increase satisfaction	0.886	0.784
6. The quality of products from mariculture make beneficiaries happy	0.823	0.677
7. The mariculture enables the beneficiaries to diversify their livelihood sources	0.747	0.558
8. The mariculture improves access to food for the beneficiaries	0.809	0.654
9. The mariculture enables beneficiaries to have sufficient food to meet their dietary needs	0.781	0.610

were in agreement with results of a study by Ika et al. [23] which empirically investigated critical success factors for World Bank funded projects and concluded that project success entails efficiency and effectiveness. The communalities which gives information about how much of the variance in each item is explained, shows high values of greater than 0.3, thus indicating that all the variables fitted well under outcome effectiveness [24].

The mean and reliability of the scales constructed on the basis of the single factor of project implementation and Cronbach's alpha that was used to test reliability of the scales are presented on a scale of 1.0–5.0 in Table 5. The findings indicated that project implementation converged on one factor scale, outcome effectiveness, with a Cronbach's alpha of 0.935, which was above the recommended lower limit of 0.700 [39], hence the study was reliable.

It was observed that there was outcome effectiveness which included increased employment, increased satisfaction and increased livelihoods and food security as indicated by a mean score of 3.56 which falls under "agree" on the ranking scale. This suggests that the items which constitute outcome effectiveness are indeed a concern to the respondents. The standard deviation of 1.271, however, suggests reasonable variation in responses. The increased satisfaction by stakeholders of the poverty alleviation mariculture projects in the Coast of Kenya supports the finding by Hurtado-Ponce et al. [57] that seaweed mariculture in Panagatan Cays of Philippines was viewed by seaweed farmers as a better source of livelihood than fishing which is only done for home consumption. The income derived from seaweed mariculture showed an increased purchasing power of both basic needs and recreational needs hence providing increased satisfaction to the beneficiaries.

It was also noted that the poverty alleviation mariculture projects in the coast of Kenya were contributing towards increasing employment including providing employment opportunities to both men and women as well as self employment to the beneficiaries with the three opinion statements on employment (Table 4) returning positive responses. This is consistent with the findings of Luxton and Luxton [50] that seaweed mariculture in Tabuaeran in the Central Pacific has been particularly attractive to the people resettled from the Gilbert Islands by the Government. Seaweed mariculture overtook copra which initially was the only source of income and made the cash-economy of Tabuaeran considerably larger than it was before. It was further noted that even though some major mariculture projects have collapsed and others have stagnated for many years, some of the projects have picked up and are already contributing towards improving food and nutrition security which is an important aspect of poverty alleviation in the coast of Kenya. This is consistent with the findings of Hurtado and Agbayani [65]; Hurtado-Ponce et al. [57] and Luxton and Luxton [50] that seaweed mariculture has enabled the beneficiaries in the Philippines and Central Pacific to meet their basic needs such as food, shelter and clothing.

3.3. Factor analysis of monitoring and evaluation planning

The original principal components analysis revealed that the first five components had eigenvalues greater than 1 and explained a total of 78% of the variance (Table 6). Based on the eigenvalue rule, these five components should be retained for rotation. However, a scree plot that was generated alongside the principal components analysis showed that only the first two components were meaningful with a clear break occurring after the second component (Fig. 2). This means that only the first two components should be retained for rotation. After removing the variables that loaded strongly on more than one component, two factors were extracted and the total variance explained increased from 78% to 83.6%, with component 1 contributing 55.27% and component 2 contributing 28.36%. Results of Parallel Analysis also confirmed that only 2 components had eigenvalues that were above the corresponding criterion values for a randomly generated data matrix of the same size. The unrotated loadings (Appendix B), showed that most items load quite strongly (above 0.4) on the first two components. Only a few items load on component 3; 4 and 5. This suggests that a two-component solution is the most appropriate. Subsequently, only the first two components were retained for rotation.

Table 5
Analysis of the mean and reliability of the single factor of project implementation.

Definition	Mean	SD	Cronbach's Alpha	No. of Items
Outcome effectiveness	3.56	1.271	0.935	9

Key: Ranking scale for the mean: 1.0–1.7 (strongly disagree), 1.8–2.5 (disagree), 2.6–3.3 (neutral), 3.4–4.1 (agree), 4.2–5.0 (strongly agree), SD=Standard Deviation.

Table 6
Comparison of initial eigenvalues from PCA on monitoring and evaluation planning and criterion values from parallel analysis.

Component number	Initial Eigenvalues (from PCA)			Criterion value from parallel analysis(D)	Decision (A > D)
	Total (A)	% of Variance (B)	Cumulative %(C)		
1	13.436	49.764	49.764	1.8010	**Accept**
2	3.899	14.440	64.203	1.6640	**Accept**
3	1.421	5.264	69.468	1.5774	Reject
4	1.297	4.804	74.271	1.5054	Reject
5	1.070	3.964	**78.235**	1.4329	Reject
6	.883	3.270	81.505	1.3613	Reject
7	.722	2.675	84.180	1.3030	Reject
8	.533	1.975	86.155	1.2472	Reject
9	.480	1.776	87.931	1.1955	Reject
10	.419	1.550	89.481	1.1364	Reject
11	.385	1.426	90.907	1.0896	Reject
12	.318	1.177	92.085	1.0405	Reject
13	.306	1.135	93.220	0.9919	Reject
14	.241	.893	94.113	0.9534	Reject
15	.218	.809	94.922	0.9092	Reject
16	.193	.715	95.637	0.8653	Reject
17	.176	.651	96.288	0.8273	Reject
18	.150	.557	96.845	0.7846	Reject
19	.143	.528	97.373	0.7474	Reject
20	.123	.455	97.828	0.7065	Reject
21	.112	.413	98.241	0.6707	Reject
22	.108	.399	98.640	0.6343	Reject
23	.100	.369	99.008	0.5989	Reject
24	.079	.294	99.302	0.5532	Reject
25	.075	.279	99.581	0.5156	Reject
26	.068	.252	99.833	0.4707	Reject
27	.045	.167	100.000	0.4168	Reject

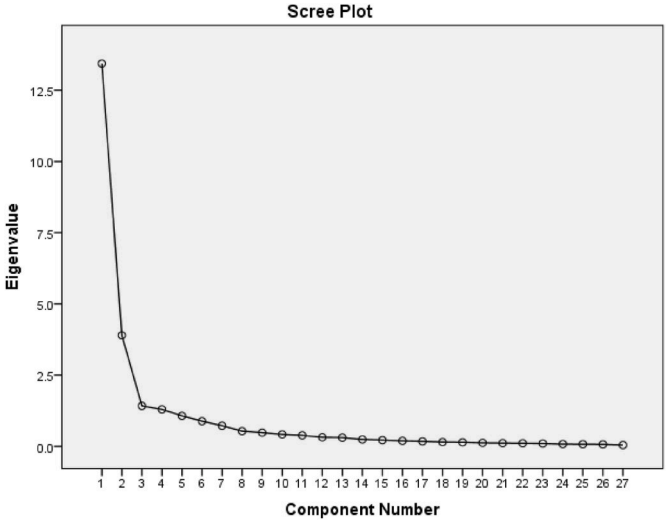

Fig. 2. Original Scree plots for Monitoring and Evaluation Planning.

An oblimin rotation was conducted and the rotated solution revealed the presence of simple structure with the two components showing strong loadings (Table 7). All variables loaded substantially on two factors. From the rotated solution, factor 1 was named tracking progress because the items that loaded strongly on it cluster around this theme. The items in factor 2 fall under the theme of timeliness and use of data and was therefore named timeliness and use of data and information. The results of this analysis support the use of tracking progress as well as timeliness as separate sub-concepts in monitoring and evaluation planning. The communalities which give information about how much of the variance in each item is explained had high values greater than 0.3 hence indicating that all items fitted well under the two factors namely tracking progress and timeliness.

The structure matrix coefficients which provide information about the correlation between the variables and the two factors (tracking progress and timeliness) are presented in the first part of Table 8. The component correlation which shows the strength of the relationship between tracking progress and timeliness is presented in the second part of Table 8.

The structure matrix coefficients indicate that there was a positive correlation between the retained variables and the two factors (tracking progress and timeliness). The component correlation matrix shows that there was a weak positive correlation (r = 0.284) between tracking progress and timeliness. The estimated mean and reliability of the scales for the two factors of monitoring and evaluation planning (tracking progress and timeliness) are presented in Table 9.

It was observed that tracking progress towards the realization of project outputs which included tracking progress in diversification of livelihoods and tracking of changes in the income of beneficiaries, changes in food security and the use of resources had a factor mean of 3.02, which is equivalent to neutral on the ranking scale. Tracking progress had good internal consistency with a Cronbach alpha coefficient of 0.934. It was also noted that timeliness in implementation of activities is a crucial factor in monitoring and evaluation planning for poverty alleviation mariculture projects as demonstrated by a factor mean of 4.01, which is equivalent to agree on the ranking scale. Timelines also had good internal consistency with a Cronbach alpha coefficient of 0.891. Timeliness in implementation of activities includes timely implementation of activities, tracking of timelines in the implementation of mariculture projects and timely reporting of progress to stakeholders. Timeliness in implementation of activities helps the project team obtain data and information for decision-making and ensuring that mariculture is relevant to the beneficiaries and the larger community. Overall, the factor means (range: 3.02–4.01) lie to the right of the mid-point of the distribution (3.0), suggesting that the items that loaded on the factors were a concern to the 182 respondents. The standard deviations (range: 1.02–1.23), however, suggest reasonable variation in responses.

Table 7
Pattern matrix for oblimin rotation of two factor solution of monitoring and evaluation planning.

Opinion Statement	Pattern Coefficients		Communalities
	Tracking progress	Timeliness	
1. The project team ensures that mariculture activities are implemented and reported to stakeholders within set deadlines	0.025	**0.906**	0.834
2. The mariculture provides for timely implementation of activities	−0.034	**0.953**	0.891
3. The mariculture allows tracking of time lines in the implementation of the project	0.013	**0.861**	0.748
4. The mariculture ensures that changes in food security are tracked	**0.903**	0.023	0.827
5. The mariculture clearly provides for tracking the use of resources to achieve food security for the beneficiaries	**0.915**	0.062	0.873
6. The mariculture greatly assist beneficiaries to track progress in diversification of livelihoods	**0.943**	−0.064	0.860
7. The mariculture promotes tracking of income generation for beneficiaries	**0.909**	−0.010	0.822

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.

Table 8
Structure and component correlation matrix for principal component analysis solution with oblimin rotation of two factor solution of monitoring and evaluation planning.

	Structure Coefficients	
	Tracking progress	Timeliness
1. The project team ensures that mariculture activities are implemented and reported to stakeholders within set deadlines	0.282	**0.913**
2. The mariculture provides for timely implementation of activities	.236	**.943**
3. The mariculture allows tracking of time lines in the implementation of the project	.257	**.865**
4. The mariculture ensures that changes in food security are tracked	**.909**	.279
5. The mariculture clearly provides for tracking the use of resources to achieve food security for the beneficiaries	**.932**	.322
6. The mariculture greatly assist beneficiaries to track progress in diversification of livelihoods	**.925**	.204
7. The mariculture promotes tracking of income generation for beneficiaries	**.907**	.248
Component Correlation of Monitoring and Evaluation Planning		
Component	1 - Tracking progress	2 – Timeliness
1 - Tracking progress	1.000	.284
2 – Timeliness	.284	1.000

Table 9
Analysis of the mean and reliability of the factors of monitoring and evaluation planning.

Definition	Mean	SD	Cronbach's Alpha	No. of Items
Tracking progress towards the realization of project outputs	3.02	1.23	.934	4
Timeliness in implementation of activities	4.01	1.02	.891	3

Key: Ranking scale for the mean: 1.0–1.7 (strongly disagree), 8-2.5 (disagree), 2.6–3.3 (neutral), 3.4–4.1 (agree), 4.2–5 (strongly agree), SD=Standard Deviation.

3.4. Correlation analysis of the dependent variable and independent variables

The correlation analysis results presented in Table 10 shows that there was a strong positive relationship between tracking progress and outcome effectiveness, r = 0.693, n = 161, p = 0.001 and a strong positive relationship between timeliness and outcome effectiveness, r = 0.723, n = 161, p = 0.001. Since tracking progress and timeliness were used to measure monitoring and evaluation planning while outcome effectiveness was used to measure implementation of poverty alleviation mariculture projects, the correlation results demonstrated that there was a strong positive relationship between monitoring and evaluation

Table 10
Pearson's correlation analysis of mariculture project implementation and monitoring and evaluation planning.

		Effectiveness	Tracking Progress	Timelines and Use of Data
Effectiveness	P. Correlation	1.00		
	Sig. (2-tailed)	.		
	n	174		
Tracking Progress	P. Correlation	0.693	1.00	
	Sig. (2-tailed)	0.001	.	
	n	161	168	
Timelines and Use of Data	P. Correlation	0.723	0.376	1.000
	Sig. (2-tailed)	0.001	0.001	.
	n	161	168	168

KEY: P. Correlation = Pearson Correlation, n = Sample size.

planning and implementation of poverty alleviation mariculture projects. This means more effective monitoring and evaluation planning is associated with more chances of success in implementation of poverty alleviation mariculture projects. This is in line with the findings of Ika et al. [23] and Canadian International Development Agency [66] that effective monitoring and evaluation increases the chances of project success.

3.5. Regression analysis results

Standard regression analysis was performed using the computed factor scores to determine the ability of monitoring and evaluation planning – implementation monitoring (captured by timeliness) and impact monitoring (captured by tracking progress) to explain variances in mariculture project implementation and results are presented in Table 11. Normal Probability Plot (P-P) indicated that the data was normally distributed. The estimated tolerance value for each independent variable was 0.859, which was greater than 0.10, confirming the absence of multicollinearity in the analysis. This was further validated by the Variance Inflation Factor (VIF) value of 1.165, that falls within $1< VIF < 5$, which means moderately correlated and allows regression to be used. The two independent variables (timeliness and tracking progress) were statistically correlated with the dependent variable (outcome effectiveness which measured implementation of poverty alleviation mariculture projects).

Regression results (Table 11) showed that timeliness had the largest beta coefficient ($\beta = 0.538$; $t = 12.058$; $p < 0.0005$); where, β = standardized beta value, p = the probability of obtaining results as extreme as the observed results of a statistical hypothesis test, assuming that the null hypothesis is correct. This means that timeliness makes the strongest unique and significant contribution to outcome effectiveness, when the variance explained by other variables in the model is controlled for. Since timeliness was used in this study to visualize self assessment which is a critical component of monitoring and evaluation planning, involving following of project operations, project output and use of resources, the significant positive coefficient of timeliness means that improvement in monitoring and evaluation planning would enhance implementation of poverty alleviation mariculture projects as measured by outcome effectiveness. In addition, it implies that the operations of poverty alleviation mariculture projects should continuously be monitored and progress be reported to stakeholders regularly to support decision making.

Similarly, tracking progress had a significant beta coefficient ($\beta = 0.491$; $t = 10.993$; $p < 0.0005$), which also implies that it makes a unique and significant contribution to implementation of poverty alleviation mariculture projects measured by outcome effectiveness. This indicates that increased tracking of progress towards realization of the immediate objectives and outcomes of the mariculture projects and tracking of changes in the income of beneficiaries would lead to greater success in the implementation of poverty alleviation mariculture projects. Since tracking progress covers both implementation monitoring and impact monitoring which are key measures of monitoring and evaluation, the significant positive coefficient of tracking progress means that increased monitoring and evaluation planning will lead to better implementation of poverty alleviation mariculture projects.

Since timeliness and tracking progress were used to measure monitoring and evaluation planning while outcome effectiveness was used to measure implementation of poverty alleviation mariculture projects, the regression results demonstrated that monitoring and evaluation planning made a unique and statistically significant contribution to the prediction of success of implementation of poverty alleviation mariculture projects as measured by outcome effectiveness. The findings therefore suggest that efficient monitoring and evaluation systems should be carefully integrated during the project design phase of poverty alleviation mariculture projects to increase the success of these projects. The findings are consistent with the observation by Perrin [25] and Swaans et al. [67] that it is important to monitor and evaluate changes along the impact pathway for the project goals and objectives to be realized.

The results showed that $R^2 = 0.730$ (Table 11) implying that our model (which includes tracking progress and timeliness) explained 73% of the variation in implementation of poverty alleviation mariculture projects as measured by outcome effectiveness. Further, the statistical significance of the model was assessed through analysis of variance (ANOVA). The ANOVA results indicated that a significant relationship exists between monitoring and evaluation planning (as measured by tracking progress and timeliness) and implementation of poverty alleviation mariculture projects (as measured by effectiveness) with $F_{(2, 158)} = 213.061$, $p = 0.001$. The model reached statistical significance with $p = 0.001$ which is less than 0.05, implying that monitoring and evaluation planning had an effect on implementation of poverty alleviation mariculture projects in the coast of Kenya. This explains the successes that have been realized in some mariculture projects such as the Kibuyuni Seaweed Farmers mariculture project and Dabaso Community Conservation mud crab (*Scylla serrata*) mariculture project that currently provide good lessons regarding the importance of effective monitoring and evaluation planning and execution towards the implementation of poverty alleviation mariculture projects. These lessons can

Table 11
Regression results of monitoring and evaluation planning and implementation of poverty alleviation mariculture projects.

	B	SE	β	T	P	Tolerance	VIF
Constant	0.003	0.042		0.063	0.950	–	–
Tracking progress	0.496	0.045	0.491	10.993	<0.0005	0.859	1.165
Timeliness	0.544	0.045	0.538	12.058	<0.0005	0.859	1.165
R Square						0.730	
Adjusted R Square						0.726	
ANOVA						$F_{(2, 158)} = 213.061$; Sig. = 0.001	

Dependent Variable: Outcome effectiveness.

be learnt by similar projects to increase success rates. These projects were effectively handed over to the beneficiaries who were properly trained on all aspects and took total ownership of the projects. This is consistent with the findings of Ika et al. [23] that design and monitoring were the most important success factors that significantly contributed to the explanation of project success.

Monitoring and evaluation should be mainstreamed in project operations so that it continues even after donor or government funding ceases, to avoid collapse of projects in order to ensure continuity. It is particularly important to ensure that monitoring and evaluation information is credible and accepted by seeking local knowledge when planning monitoring and evaluation functions. To achieve timeliness, the monitoring and evaluation planning should help to establish an efficient system with pragmatic targets for the poverty alleviation mariculture projects in the Coast of Kenya, to avoid the temptation of collecting a lot of data which may not be processed, analyzed and used as observed by Akroyed [26].

4. Conclusions

Tracking progress and timeliness were the main factors that explained most of the variance under monitoring and evaluation planning. There was a strong positive correlation between timeliness and implementation of poverty alleviation mariculture projects in the coast of Kenya as visualized by outcome effectiveness. This was also confirmed by regression results which showed that there was a significant positive relationship between timeliness and outcome effectiveness. Therefore, improvement in timeliness in terms of monitoring implementation activities would lead to improvement in outcome effectiveness. The increased use of data and information generated from monitoring implementation of activities would likely result in optimal decision making and effective implementation of poverty alleviation mariculture projects in the coast of Kenya. Further, there was a strong and positive correlation between tracking progress and outcome effectiveness. This was further confirmed by regression results which indicated that tracking progress had a significant positive relationship with outcome effectiveness. Therefore, increased tracking of progress of the poverty alleviation mariculture projects in terms of tracking project operations, tracking of outputs in the form of livelihood enhancement, use of resources to achieve nutrition and food security, and tracking of changes in the income of beneficiaries would lead to increased success in implementation of poverty alleviation mariculture projects in the coast of Kenya which would be manifested in outcome effectiveness. Since timeliness and tracking progress were the key measures of monitoring and evaluation planning, monitoring and evaluation planning has a significant effect on implementation of poverty alleviation mariculture projects in the coast of Kenya. Mainstreaming monitoring and evaluation planning at the design and implementation of mariculture projects should be made mandatory in the mariculture development policy.

The successes realized in the Kibuyuni Seaweed Farmers mariculture project and Dabaso Community Conservation mud crab (*Scylla serrata*) mariculture project provide good references for demonstrating the importance of effective monitoring and evaluation planning and execution in poverty alleviation mariculture projects. On the contrary, a number of mariculture projects such as the Ngomeni Conservation prawn culture project, Gazi milkfish and seaweed mariculture projects, among others, have collapsed, because they did not have monitoring and evaluation planning embedded in their operations. To avert failure of similar projects, monitoring and evaluation planning provides a mechanism that can be adopted to enhance the rate of success. In addition, donor syndrome has been created among project beneficiaries by establishment of small-scale projects that do not have full ownership and proper monitoring and evaluation planning. After funding ceases, the projects which should continue often collapse due to ineffective or lack of monitoring and evaluation planning and execution to keep project activities on track. Integrating monitoring and evaluation planning in the mariculture projects is therefore critical for ensuring effective tracking of project operations, output, outcome and impact including ownership of a project by beneficiaries to enhance success rates.

In view of the growing interest in mariculture as a key Blue Economy sector in Kenya and a livelihood and income source for the rural poor coastal communities, it is important that the agencies responsible for mariculture development adopt monitoring and evaluation planning and make it a mandatory requirement for approval of new mariculture projects. This should involve mainstreaming monitoring and evaluation planning in the mariculture guidelines which is yet to be developed. Government officials who are involved in granting approvals for new mariculture projects should be trained on monitoring and evaluation planning for them to understand and own it. Strategies should also be put in place to integrate monitoring and evaluation in on-going poverty alleviation mariculture projects to increase the rate of success and realize the goals of these projects.

Declaration of competing interest

None.

CRediT authorship contribution statement

Jacob Ochiewo Odhiambo: Conceptualization, Methodology, Investigation, Formal analysis, Resources, Writing - original draft, Data curation. **Joseph Wakibia:** Methodology, Writing - review & editing, Validation, Supervision. **Maurice M. Sakwa:** Conceptualization, Methodology, Supervision, Writing - review & editing.

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Appendix A. Component matrix for implementation of poverty alleviation mariculture projects

	Component	
	1	2
The mariculture makes food available to beneficiaries	.880	-.328
The mariculture increases livelihood opportunities for the beneficiaries	.859	
The mariculture improves access to food for the beneficiaries	.857	
The mariculture enables the beneficiaries to meet protein needs for their household	.849	

(*continued on next page*)

(*continued*)

	Component	
	1	2
The mariculture ensures access to good nutrition for the beneficiaries health	.842	
The mariculture enables beneficiaries to have sufficient food to meet their dietary needs	.836	-.347
The mariculture provides quality service that increase satisfaction	.834	
The mariculture has organized market channels that increase the level of satisfaction by beneficiaries	.823	
The mariculture enables the beneficiaries to diversify their livelihood	.788	
The mariculture enables beneficiaries to gain self-employment	.773	.446
The quality of products from mariculture make the beneficiaries happy	.771	
The mariculture provides alternative livelihood for beneficiaries	.766	
The mariculture greatly assists both men and women to have employment opportunities	.712	.470
The mariculture allows beneficiaries to have employment	.697	.480

Extraction Method: Principal Component Analysis.

Appendix B. Component Matrix for monitoring and evaluation planning

	Component				
	1	2	3	4	
The mariculture allows tracking of changes in the income of beneficiaries	.829	-.394			
The mariculture greatly assist beneficiaries to track progress in diversification of livelihoods	.818	-.414			
The mariculture promotes tracking of income generation for beneficiaries	.818	-.380			
The mariculture tracks the income earned by beneficiaries	.801	-.310			
The mariculture clearly provides for tracking the use of resources to achieve food security for the beneficiaries	.798	-.370			
The mariculture allows tracking of progress in the diversification of livelihoods for beneficiaries to reduce poverty	.796	-.455			
The mariculture promotes tracking of livelihood diversification for beneficiaries	.773	-.466			
The maricuture has promoted the use of an evaluating system for livelihood diversification and income generation	.773			.321	
The mariculture has remained relevant by promoting livelihood diversification and income generation	.768				
The mariculture has developed a system of assessing livelihood diversification and income levels for beneficiaries	.765				
The mariculture ensures that changes in food security	.763	-.328			
The maricuture has allowed the use of a system for evaluating livelihood diversification and income generation	.751			.363	
The maricuture allows for tracking of changes in food security	.727	-.458			
The project team ensures appropriate utilization of resources to achieve the desired output	.708	.312		-.303	
The project team controls the use of resources in order to realize livelihood enhancement	.680			-.315	
The mariculture address poverty among beneficiaries thus remaining relevant	.670	.379			
The mariculture has promoted the use of data and information for decision making	.648		-.508		.338
The project team ensures transparent and appropriate financial accounting for the marculture project	.646			-.308	.307
The mariculture ensures timely reporting to stakeholders	.642	.441			-.301
The maricuture allows stakeholders to obtain progress report in time	.632	.378		-.396	
The mariculture has promoted provision of feedback by stakeholders	.627	.405			-.351
The mariculture ensures effective use of data and information for decision making	.625	.356	-.493	.330	
The maricuture allows data and information to be used for decision making	.617	.343	-.447	.381	
The project ensures that mariculture is relevant to beneficiaries	.513	.414			
The project team ensures that mariculture activities are implemented and reported to stakeholders within set deadlines	.536	.560	.396		
The mariculture provides for timely implementation of activities	.488	.543	.392	.329	
The mariculture allows tracking of time lines in the implementation of the project	.478	.530	.428		

Extraction Method: Principal Component Analysis.a. 5 components extracted.

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