



Capacity Building Strategies and Sustainability of Food Security Projects in Arid lands, Kenya

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Abstract: Various food security projects have been implemented across the country. However, achievement of their sustainability has been a big challenge as indicated by quite a number of projects which have failed and their impacts among the community have not been felt. Non sustainability of projects has been attributed to lack of adequate capacity to manage the projects. This study sought to examine the influence of capacity building strategies on the sustainability of food security projects in arid lands in Kenya. The study is anchored on resource-based view theory. Positivist philosophy is deemed appropriate for this study. Descriptive and explanatory research designs were used. The study targeted 413 food security projects implemented between the year 2014 and 2017 and within eight Counties in arid lands in Kenya with a sample of 203 food security projects. The respondents were 243, consisting of project group leaders, UN agencies representative and County government representatives. Stratified random sampling was used to obtain proportionate samples from each of the eight Counties and primary data was collected using self-administered questionnaire. To explain the characteristics of the distribution, the study used means and standard deviation, while to assess the strength and direction of association Pearson's correlations coefficients was used. Multiple regression models assisted to assess the cause effect association between the variables studied. Various diagnostic tests were carried out. The results indicated that capacity building strategies had significant effects on sustainability of food security projects. The study recommends that more strategies for capacity building should be embraced for project sustainability.

Keywords: Capacity building, strategies, sustainability, food security projects, arid lands

1. INTRODUCTION

Project Sustainability is a measure of how well the food security projects in Counties within arid lands are meeting the requirements and hopes of the present as well as future members of the public at least three years after being handed over to the beneficiaries. In this study, continued supply of food, continued existence of food security projects, food availability, accessibility of food produce, ability to identify people with food insecurity, ability to follow the project group rules, increased relationship among community members, career opportunities created, reduced food waste, prepared environmental reports and reduced environmental degradation are selected as key indicators of sustainability of food security projects.

Food security projects around the world play a vital role in eradicating hunger among vulnerable and poor communities around the world (Bilali, Callenius, Strassner & Probst, 2018). Food security projects generally aim at reducing the food crises and famines. Such projects are part of humanitarian actions which have doubled following the crisis caused by high levels of food insecurity in the year 2017 where more than one hundred and twenty-four million people across the country and its neighboring countries were affected (Food Security Information Network, 2018). Although a lot of food is produced globally, food insecurity problems still persist in most Countries (Bilali et. al., 2018). Therefore, there is a need to transit to sustainable food systems through sustainable food projects to reduce the sustainability challenges (World Bank, 2019).

In some developed states such as United Kingdom, their government policy on agricultural reforms has done lots of research on the performance of various agricultural projects in holistic with an aim of putting up measures to improving their sustainability (Mrema, Baker and Kahan, 2008). In United State of America (USA) for instance, government significantly values sustainability infarming

ventures as reflected in their various agricultural policies. On the other hand, developing countries like Ghana recognizes the role played by agricultural projects towards improving the lives of the community and have allocated high resources to the same (Landau, 2010). Such roles include enhancement of food security, supply of raw material for food industry and creation of employment which enhances poverty reduction and sustainable environment.

In Kenya, agricultural projects contribute significantly to the economy. For instance, agricultural projects contribute 33% of Kenyan household item as well as 27% out of a hundred to the linkages between agro-based and associated industries (FAO, 2019). In an effort to counter the food crises, the Government of Kenya came up with various policy interventions for implementing from the year 2010 when the highest drought period was experienced in Kenya. These interventions included fertilizer cost reduction, policies to reform agriculture, farm produce brand, publicly land registry which is accessible, use of master plan to develop the agricultural lands and irrigation schemes developed in various areas (Kenya Food Security Steering Group, 2019). Additionally, the government adopted various strategies for sustainable projects which include supporting various initiatives and approving collaboration with various stakeholders who meet the criterion towards sustainable projects such as viable framework for monitoring and evaluation, good leadership and sustainable financial sources. Over 30 to 40 percent of the world's surface is considered drylands with over 80% of Kenyan lands being classified as dry (Smith, 2020). He added that cross to 12 percent of Kenya lands is arid and over 10 million people suffer from chronic food insecurity.

Sustainability issues in businesses is viewed in form of 'Triple-P' which emphasize on environment (planet), Social (People) and Economic (profit) (White, 2013). Martens and Carvalho (2014) in their desk research summarized various indicators for social, economic and environmental project sustainability measures and summarized as: Economic sustainability factors are financial benefits, management of resources which reduces cost, fair trade, reduced corruptions, meeting legal requirements such as payment of tax, reduced risk through better management, increased relationship with stakeholders, better corporate governance, innovation management, increased gross domestic product and increased accountability of resources. Environmental sustainability factors include reduction on misuse of resources, material input and output minimization, reduced water and soil contamination, improved energy use, reduced global warming, reduced liquid waste, protection of ocean, lakes, coasts and forests and eco-efficient assurance of intergenerational equity. Social sustainability factors include education offered to labor force, practices which ensure health and safety of labor, good relationship with stakeholders, benefits and career opportunities to the beneficiaries, embrace nondiscrimination, reduced child labour, giving indigenous rights, anti-bribery and anti-corruption practices, social justice, freedom to join and exit project group.

According to FAO, IFAD & WFP (2015), food project sustainability involves continuation of neighborhood activity fortified by the extend and era of successor administrations and activities as a result of project-built activities. According to their reports, a good measure of sustainability of any agricultural or food projects should be based on three perspective of economy, social and environmental. Thus, on the projects they have implemented, they measure their impact by checking if the projects still existed three years after handing over to community, if the food produce are still being supplied, available and accessible of food by all the local community, if the community members have mechanisms to identify people or household with food insecurity and the amount of environmental degradation caused by either landfill or the used fertilizers or pesticides.

Sustainability of food projects has been a great challenge in various developing countries, Kenya included, where huge money and time is invested during implementation but expected impact is not realized (IFAD, 2020). Bilateral aid agencies report indicated that the trend for food project implementation indicate improvement, however, sustainability of the same is disappointing as very few projects are sustainable (IFAD, 2020). Additionally, sustainability of projects is realized when institutions and community around the project continue to benefit from outcome without the support from external source. This argument is supported by Kamau, Rambo and Mbugua (2021) indicating that due to low community participation, insufficient funding and support structures, food projects stall and their impact is not felt by the beneficiaries. In this study, measure of project sustainability will be indicators falling under economic, social and economic sustainability and the indicators used to measure sustainability of the projects include continued food supply, increased accessibility of food produce, increased availability of food among the community and reduced food waste.

Capacity building in project management refers to undertaking to expand capability of the firm or public in delivering the intended project goals (McLeroy, 1996). Kelly, Mock and Tandon (2001) defines capacity building as activities that affect community ability to identify an economic activity, mobilize the necessary resources and plan their action and implement their plan so as to address their problems. Komujuni, Basheka and Oluka., (2013) indicated that the utmost essential conceptualization of capacity building strategies for project sustainability includes top-down, bottom-up, partnership and public organizing. They indicated that for top-down approach to be embraced, the organizational capacity, individual expertise and training programs need to be planned, coordinated and facilitated within the organization to ensure resources like facilities, equipment and personnel are available when needed. For bottom-up organization approach to be effective, development of technical expertise is essential so as to broaden community skills for their benefit and for strategic benefits. The study indicated that advancement of organizations between extend bunches who might something else have small or no working relationship offer assistance to construct the capacity. It characterized as the development and utilize of transferable information, aptitudes, frameworks and assets that influence community and person level changes reliable with open related objectives and targets.

Persistent drought in the region, create challenges in the water provision for livestock and farming. There is drastic reduction of glaciers land as a result of global warming thus adversely affecting the agricultural activities on arid lands (Ndambiri, et. al., 2012). Most of the Kenyan lands is occupied by Arid lands (Ndambiri, Mbogoh, Ng'ang'a, Muiruri, Nyangwes, Ogada, Omboto, Kefa, Kubowon and Cherotwo, 2012). Thus, arid lands are home to approximately four million pastoralists with some areas practicing small scale farming. Despite many occupants, arid lands have the highest incidences of drought in the country. Counties within arid lands faces perennial drought which adversely affect their economic activities which is basically, agro-pastoral to include crop farming (through seasonal rain and irrigation), tourism, bio-business and agro-livestock businesses (Ndambiri, et. al., 2012).

1.1. Statement of the Problem

Sustainability of projects aimed at ensuring food security in Counties within arid lands has been a subject of concern to the government. This is because, despite the implementation of numerous food security projects by the government in partnership with various community-based organizations in Counties within arid lands, food insecurity persists where over 60% of the populations rely on relief food distribution every year (FAO, 2019). The aim of food security projects is to create self-reliance households in terms of food supplies thus preventing related problems like malnutrition, death from hunger and extreme poverty. However, there is inadequate food supplies due to unsustainable food security projects (FAO, 2019).

1.2. Objectives of the Study

The purpose of this study was to investigate the influences capacity building strategies on sustainable food security projects within Kenyan aridlands.

1.3. Research Hypothesis

H_{01} : Capacity building strategies does not significantly influence sustainability of food security projects in Kenyan arid lands.

1.4. Significance of the Study

The study will inform practitioners such as development partners, project donors and sponsors by gaining insights on how projects can incorporate various project management practices with the view to enhance sustainability of the projects. Practitioners can use the information from this study to shape the future of the food projects towards their sustainability. Policy makers in the food security and agricultural projects in Kenya will use the findings to enact relevant policies and make informed decisions which provide enabling environment for food security projects to be sustainable and improve the national Gross Domestic Product (GDP). The study will also be of beneficial to scholars in related future investigation as it can form a basis for discussions in studies related to the issues leading to unsustainable food security projects hence food insecurity in Kenya. The study will inform the academicians on the present gaps in knowledge on sustainability of food projects and how those gaps could be addressed.

1.5. Scope of the Study

Focus of this study is on food security projects within eight Counties in arid lands in Kenya. The study targeted 413 food security projects supported by County government in collaboration with various agencies in 8 Counties within arid lands in Kenya implemented between the year 2014 and 2017. The study took place between January and April, 2022

1.6. Limitations of the Study

Individuals selected were unwilling to participate in the study due to fear of victimization and due to confidentiality of the information. To counter the limitation the researcher provided the letter of research authorization and NACOSTI letter to the respondents in order to make them aware that the investigation is intended for scholarly work. This ensured that the limitation on confidentiality does not affect the validity and generalizability of the research findings. Some of the questionnaires were not returned. However, the research made follow up through telephone call and physically revisiting the projects where the study is carried out to obtain filled up questionnaires. Additionally, the research assistant was also used to send reminders to project group leaders to ensure the response rates is sufficient for analysis. Since community members formed part of the respondents, there was a challenge of language barrier which was countered by use of local research assistance for interpretation.

2. LITERATURE REVIEW

2.1. Theoretical Review

Main thrust of resource-based view model by Wernerfelt (1984), lies on the need for a firm to apply treasured tangible and intangible resources available for sustainable competitive gain. RBV theory aims to clarify the inner sources of firm's maintained competitive advantage. In an effort to develop the theory, Barney (1991) stated that for an organization to obtain a golden opportunity for its sustainability, they need to possess strategic resources. Barney indicated that superior sustainable performance of projects can be determined by the ability of the project leader to obtain and utilize tangible resources or intangible resources. Acquiring and controlling of the rare, valuable inimitable and non-substitutable capacities and resources are the key drivers of the proposition of this theory. The theory further explains the ways of obtaining resources which are valuable using strategic capacity building approaches such as external source or community contribution (Barney, 1991). This informed on the formulation of hypothesis (H_0 : *Capacity building strategies does not significantly influence the sustainability of food security projects in arid lands, Kenya*).

Various scholars (Collis, 1994; Preim and Butler, 2001; Gibbert, 2006; Lockett et. al., 2009) have critiqued the RBV theory. For instance, the theory has been mentioned to have insufficient implications to the management and not capable of enhancing accuracy in organizations operations. This implies that the theories try to exaggerate in terms of how a manager can control the resources assigned to him/ her and can use them to predict the future of the undertaking (Priem and Butler, 2001). Additionally, the theory has been critiqued in terms of being very narrow which make them inappropriate in the ability to be expanded further (Jeroen, Spender and Aard, 2009). However, they indicated that RBV theory can withstand the critiques by specifying the specific resources which are valuable and they are applied to ensure sustainable operations.

2.2. Empirical Review

Desk research carried by Crisp, Swerissen and Duckett (2009) on 'approaches to capacity building in health sector specifically focusing on the consequences for measurement and accountability', established various strategies which past studies have used to measure capacity building in projects. In general, the key capacity building strategies which can successfully be employed in projects include: management oriented organizational, community-oriented organization and partnerships organizing. The study also summarized indicators specifically relevant for each strategy. For instance, development of the project policies, leveraging on the resources allocated by the top management to enable implementation of the plan and embracing motivation through giving incentives to the workers were mentioned as relevant to measure the organizations which uses top-down strategy for their capacity building. Additionally, projects which embrace the bottom-up strategies for their capacity building will have programmes to enhance staff development which improves their skills, participation, commitment and positive attitude to generate ideas necessary for the project sustainability.

For partnership to be ensured then project must embrace the programmes for activation of the community and collaborations, networking with potential supporters and sharing information related to the project (Crisp, Swerissen and Duckett, 2009). Moreover, involvement partnership can be created if the project will consult main community pioneers and involve individuals from under privileged sets. The study concluded that building of the capacity of a projects clear strategy have to be considered. The study was relevant to current study in identification of the relevant indicators for M&E affected project maintainability. However, this study had some limitations which the current study will fill including analysis based on direct relationship between the independent variable (capacity building strategies) and project sustainability. Thus, the current study brings in the account for contextual factors in additional.

Komujuni, Basheka and Oluka (2013) conducted a study in Uganda on 'community capacity building strategies and sustainability of health care projects' focusing on Palliative care projects. The aspects for capacity building strategies used in this study included partnership, community involvement in resource mobilization and management commitment in providing resources needed in the project operation. Sponsor officials, employees and recipients of the scheme were the key informant. Data collection was done using questionnaire and interview and the analysis was done using graphic and inferential. It was found that for the project to be sustainable top management should be committed to come up with strategies which will ensure they employ strategies for resources to be available, community are engaged to create ownership and necessary partnership are created which increases networking. Thus, the study informed the current study in terms of relevant indicators to use to measure capacity building for project sustainability. The study assumed direct relationship of the study variables and ignored the enterprise environmental factors which can influence the direct relationship. Current study will address the limitation by including moderating effect of the enterprise environmental factors.

According to Wabwoga and Wakhungu (2013) on their study on 'determinants of sustainability of community food security projects in Kiambu County, Kenya'. The study indicated that projects are not sustainable and this has been attributed by lack of community participation in project scheduling and execution hence possession is not created. Additionally, their study indicated farmers are not adequately empowered on sustainable farming methods. This is to mean without the necessary skills and knowhow on how to practice sustainable methods, it would be very difficult to create the intended impact when the donors withdraw supports. Following the focus group discussion carried out in this study, suggested expected functions of group members towards sustaining projects include resource mobilization, labour provision and attending the meetings. These key functions were mentioned to have been used when the sponsors were still overseeing the projects operations. However, the findings were that such functions no longer take place in the study area and hence explained why most of the community food security projects had seized to exist two to five years after the exit of the sponsors' support.

A study was conducted in Kajiado South Sub- County, Kenya by Koonyo (2017) on influence of capacity building on performance of Maasai HIV/AIDs awareness and preventive projects. The study specifically focused on influence of project leadership capacity building, project design capacity building, project implementation capacity building and financial management capacity building on project performance. Targeted population was community groups for HIV/ AIDs projects and employee at APHIA Plus. Data was collected using questionnaire and examination using descriptive, Pearson's correlation coefficient and multiple regression model. A strong positive relationship between the capacity building and performance of HIV/AIDs projects was reported. Capacity building aspects on top management, designing of the project and financing of the projects had influence performance most. On the other hand, M&E do not influence the project performance, which is against the theory. Probably, the contradiction of the findings can be explained by the indicators chosen to measure the capacity building used which are quite different from the variables used in other studies. Therefore, the study will be used to proof the theory that project M&E positively influences the project sustainability. Additionally, this study assumed a direct association between study variables which from the theory, the relationship can be altered by the situation in which the project has been implemented. The current study will include the moderating effect.

Rogito et. al., (2020) conducted a study on ‘capacity building in participatory monitoring and evaluation (PME) on sustainability of irrigation projects in Kitui county, Kenya’. Various attributes for PME and project sustainability were given on a five-points Likert scale. Information was gathered using questionnaires and interview schedules. There was no record of field visits by the farmers and no trainings were offered to the farmers indicating less involvement of the people involved in projects directly on project monitoring and evaluation. In addition, there were no proper records which indicate how resources such as funds to the projects are utilized, an indicator of lack of accountability. This study was relevant as it provided support to the problem at hand. However, the main limitation, which is contextual gap, is the focus on one county out of eight Counties within arid lands which are adversely affected by food insecurity due to unsustainable projects hence making it impossible for the findings to be generalized in similar bigger geographical area. The current study bridges the gap by covering all the projects within the arid lands.

2.3. Conceptual Framework

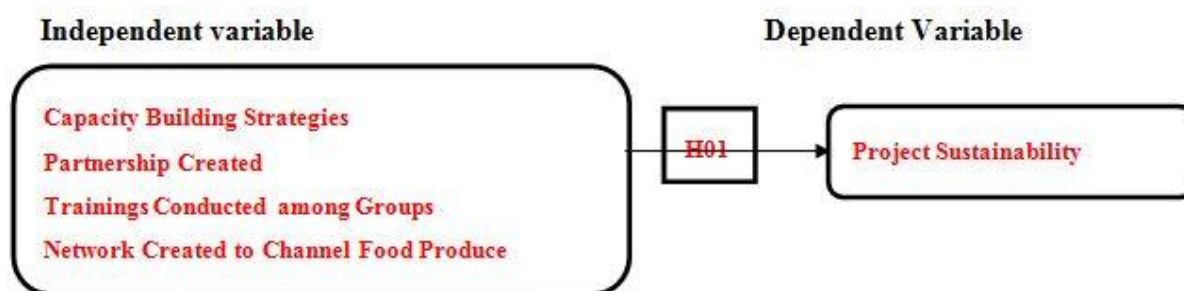


Figure1. Conceptual Framework

3. METHODOLOGY

This study used descriptive and explanatory research designs. According to Zikmund (2003), descriptive research design is selected in order to allow full description of characteristics of the research variable as well as allow independence in study variables investigation as guided by the positivism philosophical orientation. Explanatory research design was applied to examine the hypothesis by measuring the relationship between variables of the study. The study was guided by positivism so as to consider the situation of the capacity building strategies and fragment various aspects so as to assess the association between the fragments and composite of project sustainability and form hypothesis to be measured quantitatively.

The analytical model tests for the association amid dependent variable (project sustainability) and the independent variable (capacity building strategies) was expressed as:

$$Y = \beta_0 + \beta X + \varepsilon$$

Where: Y is project sustainability and X is composite index for capacity building strategies, β is the regression coefficients, β_0 is constant and ε is and for stochastic error terms.

Composite index in statistics is a compound measure that aggregates multiple indicators of a given study variable (Field, 2017). It is constructed by combining several variables or indicators (which provide direct measure of a specified aspect of the objective) together and help summarize and rank specific observations. Composite indices were computed by obtaining the mean aggregate of indicators for research variables. The relationship between the independent and dependent variables was determined using the Pearson correlations coefficient. Coefficient of determination, R^2 was used in determining the percentage of the disparity in the dependent variable which can be described by variation in the independent variables. F statistics was used to conclude whether the overall model is significant and valid. P-value indicated statistical significance of individual regressor.

Various diagnostics tests to ascertain that the OLS assumptions have not been violated was carried out including the test for normality, heteroscedasticity and linearity test. Correlation coefficient was selected as it gives strength as well as the direction of the linear relationship which may be positive or negative. A positive correlation indicates a direct influence where an increase in one variable led to increase in the other variable while a negative correlation indicates an inverse relationship where an increase in one variable led to a decrease in the other variable (Field, 2017).

The unit of analysis was food security projects in eight Counties within AridLands in Kenya which are registered under National Drought Management Authority (NDMA) and which were implemented between year 2014 and 2017. Kenya Resilience Investment Tracker (2018) from NDMA indicate 413 food security projects implemented by various UN agencies in partnership with the government of Kenya and distributed within the eight Counties in arid lands in Kenya. The unit of observation was 413 project group leaders, 32 head of the field officers from FAO, FH-Kenya, WFP & Concern Worldwide Kenya offices in the eight Counties within arid lands and 8 County government officers in charge of food/ agricultural projects in each of the eight Counties in Arid lands. This gives a total unit of observation of 453. For this study only project group leaders were sampled using Slovin's formula to give a total sample of respondents of 243.

Questionnaire method was used to obtain the primary data for this study as it guaranteed high response rate, allows data collection from large population and also allows for the collection of views, opinions and perception from the respondents on the issues being investigated. The questionnaire contained both open ended and closed ended questions, which enabled coding of responses easier and also give respondents' chance to give their opinion. Piloting was carried out in food security projects in Kitui County which is in semi-arid lands. Kitui County has a total of 45 food security projects implemented by UN agencies which forms 10 percent of the target population. Face validity was assessed by considering how suitable the contents of a test is on the surface. In this case subjective assessment of the questionnaire appearance in terms of readability and feasibility. Content validity was ensured by subjecting questionnaire to my supervisors as well as my fellow students so as to evaluate if each question in the questionnaire is crucial and useful to achieving the study objectives as recommended by (Saunders, Lewis and Thornhill, 2009). Construct validity was measured by dividing the questionnaire into various sections guided by the study specific objectives or variables and also to guarantee same closely ties to the study conceptual framework. Since most of the questions in the questionnaire are Likert scale, Cronbach alpha method was used to measure of internal consistency and gives idea on how closely set of items in a given group are related. Cronbach alpha coefficient of values obtained were above 0.7 indicating there is consistency.

For quantitative analysis was done using descriptive statistics including mean and standard deviation to explain characteristics of distribution and allow examination of the responses of each study variable and compare the output of two or more variables. Factor analysis was done to condense many factors under each variable into few key factors for each variable. This led to performing of Kaiser-Meyer-Olkin (KMO) test for sampling adequacy. Pearson correlation coefficient was used to establish strength and nature of the association between the dependent and the independent study variables. Linear regression model was used to establish the influence of independent variables on the dependent variables as recommended by (Gujarati and Sangeetha, 2007; Field, 2017).

One of the ethical considerations for the current study was informed consent where respondents were made aware of what the study is all about in terms of its objective and the intention so that they participate on voluntary basis. In doing so, the respondents were not coerced to participate and hence they were willing to give more accurate data. In addition, the investigator guaranteed the respondents of the privacy of the data. In so doing fear of being victimized from the respondents was reduced hence willingness to be involved in the survey. Non-disclosure of the respondents identify in terms of names, addresses or telephone numbers was assured and hence the respondent felt free to provide objective data in relation to study objectives.

4. RESEARCH FINDINGS AND DISCUSSIONS

4.1. Demographic Information of the Respondents

Out of 243 questionnaires distributed to the various respondents, 192 were correctly filled and returned, giving a response rate of 79 percent. The main economic activities in Counties within the arid land was livestock keeping which had a percentage score of 57 followed by Livestock trading (48 percent) and small-scale agriculture (42 percent). Livestock or animal products was the main sources of food within the Counties (64 percent), followed by honey from bee keeping (48 percent), then food from small scale farming (42 percent). In terms of education levels most of the respondents had attained university-level (30.7%) followed by those with secondary-level education (24%), then those with primary-level education (22.4%) an indicator that the respondents were literate and capable of interpreting and answering the questions posed in the questionnaire accurately.

4.2. Descriptive Analysis

Capacity building strategies statistical results were collected based six items in a five Likert scale where 5 = very great extent; 4 = great extent; 3 = moderate extent; 2 = low extent and 1= very low extent. The percentage, means and standard deviations for the variables were computed on a Likert scale and presented as shown in table 1.

Table1. Descriptive Statistics for Capacity Building Strategies

| Capacity Building Strategies | Very Low extent | Low Extent | Moderate Extent | Great Extent | Very Great Extent | Mean | Std. Dev. |
|-------------------------------------------------------------------------------------------------|-----------------|------------|-----------------|--------------|-------------------|---------------|---------------|
| Food security projects emphasize on information sharing among group members | 3.6% | 6.3% | 24% | 41.1% | 25% | 2.18 | 1.011 |
| Training conducted among project group members has enabled sustainable undertakings | 4.2% | 4.7% | 30.2% | 39.1% | 21.9% | 3.71 | 0.999 |
| Training needs are identified to ensure customized training | 3.6% | 9.4% | 28.6% | 34.9% | 23.4% | 3.15 | 1.053 |
| Projects groups members regularly trained to develop technical expertise for project activities | 3.6% | 10.9% | 31.8% | 38.5% | 15.1% | 2.51 | 0.997 |
| Some Projects activities are executed through resources mobilized from the created partnerships | 4.2% | 14.6% | 29.2% | 35.9% | 16.1% | 3.45 | 1.057 |
| Networks are built to ensure farm produce are distributed among community members | 4.7% | 16.1% | 29.2% | 33.3% | 16.7% | 2.41 | 1.089 |
| Average | | | | | | 2.9016 | 1.0343 |

Results in table 1 shows that to a very great extent respondent greatly agreed that training conducted among project group members has enabled suitable undertakings ($\bar{x} = 3.71$; $s = 0.999$). The respondents to a great extent agreed that training needs are identified to ensure customized training ($\bar{x} = 3.15$; $s = 1.053$) and that some projects activities are executed through resources mobilized from the created partnerships ($\bar{x} = 3.45$; $s = 1.057$). Respondents to a moderate extent agreed that food security projects emphasize on information sharing among group members ($\bar{x} = 2.18$; $s = 1.011$); project groups members are regularly trained to develop technical expertise for project activities ($\bar{x} = 2.51$; $s = 0.997$) and adequate networks are built to ensure farm produce are distributed among community members ($\bar{x} = 2.41$; and $s = 1.089$).

The aggregate mean score and standard deviation for capacity building strategies is 2.9016 and 1.0343 respectively. The aggregate mean score round of to a score of 3 on the five-point Likert scale adopted in the study implies that to moderate extent the respondents felt that the capacity building strategies have not been engaged sufficiently to better the project. The findings in relation to individual strategy for capacity building are in agreements with the assertion by McLaughlin et al., (2017) who indicated that capacity building strategies include community empowerment through trainings, policy and procedure development organs for top-down approach, use of community outreach activities, formation of the groups to maintain projects, information sharing, training for technical knowhow and building of networks within and without the organization. Relatively low values of means which indicate perception of respondents as having less importance are confirmed by Rogito et al., (2020) study which affirmed that among the projects studied, there was no record of field visits by the farmers and no trainings were offered to the farmers, lack of proper records and hence lack of accountability.

4.3. Factor Analysis

Factor analysis was carried in the study, in order to check out any correlated variables for redundancy in data to be reduced. This was done by subjecting the statements to dimension reduction in SPSS using principal axis factoring and varimax rotation to help in data reduction and identify latent variable items that best explain a given variable. During this process coefficients with absolute value below 0.3 were suppressed, this yield to only those items with high significance and influence in

variable formation. The extraction of the factors followed the Kaiser Criterion where an eigen value of 1 or more was deemed to indicate a unique factor.

Total Variance analysis indicates that the six (6) statements on capacity building strategies can be factored into 1 factor as shown in table 2 which also shows the factors (items) and percentage of the total variance explained.

Table2. Capacity Building Strategies Total Variance Explained

| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | |
|-----------|---------------------|---------------|--------------|-------------------------------------|---------------|--------------|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 2.866 | 47.770 | 47.770 | 2.866 | 47.770 | 47.770 |
| 2 | .850 | 14.174 | 61.944 | | | |
| 3 | .714 | 11.897 | 73.841 | | | |
| 4 | .647 | 10.783 | 84.624 | | | |
| 5 | .538 | 8.973 | 93.597 | | | |
| 6 | .384 | 6.403 | 100.000 | | | |

Extraction Method: Principal Axis Factoring

4.4. Correlation Analysis

Correlation analysis was conducted to established the strength and nature of the association between the study variables. Pearson correlation coefficient between capacity building strategies and project sustainability as 0.612. The results indicate the correlation coefficients as positive and significance with p-value of 0.000. This indicate that capacity building strategies considered in this study positively influences the sustainability of food security projects.

4.5. Linear Regression Analysis

Since the sample was large (203), the study used Kolmogorov-Smirnov Test which is a numerical method. The decision rule was if the p-value (Sig.) is less than the test significance level which is 0.05 for this study, then the hypothesis that the observed distribution is normally distribution is rejected and the study concludes the distribution is not normally distributed, and vice versa.

Table3. Results on Kolmogorov-Smirnov Test for Normality

| | Tests of Normality | | | | | |
|------------------------------|---------------------------------|-----|-------|--------------|-----|------|
| | Kolmogorov-Smirnov ^a | | | Shapiro-Wilk | | |
| | Statistic | df | Sig. | Statistic | df | Sig. |
| Capacity Building Strategies | .050 | 192 | .200* | .992 | 192 | .335 |

Distribution was normally distributed since the p-values obtained were greater than 0.5.

Levene test used in this study was used to test hypothesis that the error variances are all identical (homoscedasticity). The results are indicated in table 4 below.

Table4. Homoscedasticity Test Results

| Variable | Levene Statistic | df1 | df2 | Sig. |
|------------------------------|------------------|-----|-----|------|
| Capacity Building Strategies | 1.222 | 18 | 171 | .248 |

The hypothesis that the error variances are all identical was not rejected since the p-values were higher than 0.05, hence concluding that there was no heteroscedasticity in the data and are fit for conducting inferential statistics.

The study ascertained the assumption of linearity by testing the linear relationship of the independent variables on the dependent variables using correlation coefficients. The linearity test results are shown in table 5.

Table5. Results of Pearson's Correlation Linearity Test

| | | Sustainability of Food Security Projects |
|------------------------------|---------------------|------------------------------------------|
| Capacity Building Strategies | Pearson Correlation | .612** |
| | Sig. (2-tailed) | .000 |
| | N | 192 |

The findings presented in table 5 indicates that there is a significant positive linear relationship capacity building strategies and sustainability of food security projects at $p < 0.05$ significant levels. Correlation does not necessarily mean that there is a causal relationship between variables of the study. Thus, it was important to conduct regression analysis in order to estimate causal regression.

To investigation of the effect of capacity building strategies on the sustainability of food security projects in Counties within arid lands in Kenya linear regression analysis was done. The model summary is shown in table 6.

Table6. Model Summary

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1 | .781 ^a | .611 | .593 | .5521 |

a. Predictors: (Constant)Capacity Building Strategies

Table 6shows that the adjusted R-squared was 0.593 with a standard error of estimate being 0.5521. This implies that 59.3 percent of the variation in the dependent variable (sustainability of food security projects)was explained by the variations in capacity building strategies. The remaining 40.7 percent of the variations in the dependent variables are accounted for by others variables not discussed in this study. The findings agree with Child and McGrath (2011) who indicated that project management practices are becoming increasingly important as more work in most organizations is organize through projects and programmes.

The ANOVA results was used to test the overall significance of the model.

Table7. ANOVA^a Results

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|-------|------------|----------------|-----|-------------|--------|-------------------|
| 1 | Regression | 41.133 | 5 | 8.227 | 55.214 | .000 ^b |
| | Residual | 26.218 | 175 | .149 | | |
| | Total | 67.350 | 180 | | | |

a. Dependent Variable: Sustainability of Food Security Projects

b. Predictors: (Constant), Capacity Building Strategies

The F-statistic for the model was 55.214 with 5 degrees of freedom and its p-value was 0.000. This implies that the overall model is significant ($p < 0.05$).

The regression coefficients result for capacity building strategies on the sustainability of food security projects are fed into the model to produce the ultimate model as:

Project Sustainability= 0.094 + 0.235X

From the regression coefficient, the constant it can be interpreted that holding all factors constant the project sustainability would be 0.094. The objective sought to establish the influence of capacity building strategies on the sustainability of food security projects in Counties within arid lands in Kenya. The null hypothesis was tested and hypothesis was derived as:

H₀₁: Capacity building strategies does not significantly influence sustainability of food security projects in Kenyan arid lands.

The value of the coefficient of capacity building strategies was 0.235 with a p-value of 0.009which is less than 0.05. Therefore at 5% level of significance, the null hypothesis was rejected implying that capacity building strategies significantly positive influences sustainability of food security projects. The coefficient simply a unit change in capacity building strategies leads 0.235increase in the sustainability of food security projects in Counties within arid lands in Kenya. This is in agreement with the results presented by Crisp, Swerissen and Duckett (2009) which indicated that building capacities with clear strategies such as collaborations, networking, information sharing, staff training and development, increases the probability of sustainable projects.

5. CONCLUSION AND RECOMMENDATIONS

The study conclude that capacity building strategies significantly contributed positively towards sustainability of food security projects in Counties within arid lands in Kenya. This means that the

more the strategies put in place by sponsors, government and other community-based organizations, the more likely that projects will be sustained, an aspect which concurs with the expectations. This also explain why; some food security projects are still existing in the region despite of challenges they faced and although to small extent there is increased food supply. Additionally, the study concludes that also the project had adopted various strategies for capacity building, they still lacked in creating adequate forums for various project groups to share the best practices which have worked for them towards sustainability. The trainings conducted were not regular and hence not adequate to equip farmers and group leaders with adequate skills to run the projects and they had not built adequate networks to ensure their farm produce are distributed among the community members. This explain why there is insufficient in food supply, inaccessibility of food in all regions, and some of the project's groups formed during implementation of food security projects are not operating.

The study recommends that there is a need for more strategies to be put in place to ensure capacity building among the people involved in food security projects should be developed. For instance, ministry of agriculture and project sponsors should modify funding policies to extent grants and loans to formed project groups so as to improve the financially related activities. There should be clear guidelines on how extension services can be utilized to equip farmers with knowledge and skills related to sustainable farming and project management methods. Project sponsors and both national and county government should come up with clear policies which enables farmers to create network for the community food produce. It is responsibility of the project sponsors and government to ensure that farm produce is marketed to avoid exploitation from middle man. It is recommended that the government should establish centers such a cereal board to help farmers sell off their products at economic price. There should be framework where farmers are trained on value addition especially to the perishable produce so as to reduce or eliminate food wastage.

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