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# Role of Institutional Capacity Factors and Technological Practices in Implementation of Food Security Projects in Hamisi Sub-County, Vihiga County, Kenya

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**Abstract:**-This paper sought to establish the role of organizational capacity factors and technological practices in implementation of food security projects in Hamisi Sub-County, Vihiga County, Kenya. Specific objectives of the study were to establish the extent to which institutional capacity and technological practices influence implementation of food security projects in Hamisi Sub-County. A descriptive survey design was adopted for the study. The study was conducted in all the 24 producer groups in the sub-County. Questionnaires and interview guides were used as main data collection instruments. Both descriptive and inferential statistics were used in the analysis process. The results showed that institutional capacity and technological practices influenced the successful implementation of the projects in the sub-County to a great extent. It was further noted that institutional capacity has a very strong significant correlation with successful implementation of food security initiatives in the sub-County. In regard to technological practices, it was further established that they had a very strong significant correlation with the successful implementation of food security initiatives. The results show that most of the efforts were failing due to poor institutional capacity factors and also low application of targeted technological applications aimed at driving these projects to success. It is therefore recommended that success in food security initiatives depend on institutional capacity and application of effective technological practices. Key stakeholders should endeavor to strengthen the above factors for effective implementation of these initiatives in the study area.

**Key words:** Food Security, Institutional capacity, Sustainable Development Goals, Technological practices

## I. INTRODUCTION AND BACKGROUND TO THE STUDY

Food security has had several definitions but it is basically defined as the availability of food and one's access to it. Food security when examined from a more complex definition, focuses on the individual, household, national, regional and global levels (FAO, 2010). Under this broad view it is noted to be achieved when all people, at all times have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life (FAO, 2009). A

household is considered food secure when its occupants do not live in hunger or fear of starvation. Stages of food insecurity range from food secure situations to full-scale famine. Household food security is the application of this concept to the family level with individuals within households as the focus of concern (Sarr, 2012).

The world produces enough food to feed everyone with at least 2,720 kilocalories per day, which is well above Food and Agriculture Organization of the United Nation's (FAO's) recommended minimum of 2250 kilocalories per day (Sunderland, 2011). Ironically, food insecurity remains globally widespread and stubbornly high (FAO, 2006). Over 900 million people globally experience the hardship that hunger imposes, a figure which continues to rise even amidst the riches of the 21st century (FAO 2010). Of these, 855 million (95 percent) are in the developing world, 10 million in industrialized countries and 35 million in countries in the transition stage (FAO 2010).

The food security situation in Africa in the year 2012 was overshadowed by a looming food and humanitarian crisis in the Sahel due to drought (FAO, 2016). This came on the heels of the crisis in the Horn of Africa in the previous year, when 12 million people required humanitarian assistance and famine was declared in Somalia. Even though famine conditions no longer exist in Somalia, nearly one-third of the population was reported to be in crisis during the first quarter of 2012, unable to fully meet essential food and nonfood needs (Hilderink, Brons and Ordenez, 2012). Similar trends were observed among the East African countries including Somalia, Uganda, Kenya and Tanzania due to changes in the weather patterns (FAO, 2012)

The goal of food self-sufficiency was largely attained in the early years of independence until the late seventies after which massive food shortages set in. Since then the goal of food self-sufficiency and food security has been a dream with the main challenges of access, availability and affordability taking a center stage among the poor (Chege, Lemba, Semenyé, & Muindi, 2016). The initiative by the government and partnership with Non-Governmental Organizations Food

security projects in most arid and semi-arid areas including Hamisi Sub-county in Vihiga County have not offered better solutions on the food security debate.

More than 64% of the communities in which these projects have been initiated are still faced with severe hunger (FAO, 2010). This paper established role of both institutional capacity and technological practices in the implementation of these initiatives with key focus on food security projects in Hamisi sub-County in Vihiga County.

## II. STATEMENT OF THE PROBLEM

Despite significant food security projects initiatives in the Sub County, food insecurity and extreme rural poverty has continued to pose major socio-economic problems to many households in Vihiga County to date. The transition rate of food poor households to self-reliance of food supplies has largely remained inadequate to date (Chege *et al*, 2016). Many of the beneficiaries of food security projects interventions have frequently failed to put in place measures for self-reliance once the sponsored project intervention gets to an end and therefore food security has remained elusive (FAO, 2012).

This has raised concern to stakeholders as there are always huge budgetary allocations to emergency relief food distributions. Whereas it appears that there are many factors constraining the implementation of agenda two of the sustainable development goals, this paper sought to examine role of both institutional capacity factors and technological practices on implementation of agenda two in Hamisi sub-County, Vihiga County, Kenya.

## III. OBJECTIVES OF THE STUDY

### 3.1 Main Objective of the Study

The main objective of the study was to analyze the role of organizational capacity and technological practices in implementation food security projects in Hamisi Sub-County, Vihiga County, Kenya.

### 3.2 Specific Objectives of the Study

The objectives of the study are as follows:

- To establish how institutional capacity influence implementation of food security projects in Hamisi sub-County, Vihiga County, Kenya
- To explore the extent to which technological practices influence implementation of food security projects in Hamisi sub-County, Vihiga County, Kenya.

## IV. RESEARCH QUESTIONS OF THE STUDY

The study sought to answer the following questions;

- In what way does institutional capacity influence implementation of food security projects in Hamisi sub-County, Vihiga County, Kenya?

- To what extent do the technological practices influence implementation of food security projects in Hamisi sub-County, Vihiga County, Kenya?

## V. SIGNIFICANCE OF THE STUDY

It is established that the outcome of this study will assist in reviewing national and local food security policies particularly in the accuracy, design and implementation of food security initiatives and rural development projects. The study is also meant to assist decision makers particularly on the funding policy modes to review the policies to target the resource poor, vulnerable people and appropriate areas and ways of implementation of projects in addition to exploring other ways of funding projects. Finally, the study outcomes will enable policy makers to formulate, design and implement policies that would create enabling environments for sustainable project successes and private sector involvement in development projects. The study shall contribute new knowledge to the existing literature on food security not just in the sub-County but also in the country as a whole.

## VI. LITERATURE REVIEW

A number of global agreements like the World Food Summit and Millennium Summit have set goals and specific targets for collective action in reducing the incidence of hunger and food insecurity (Manning, 2021). Collectively, food insecurity reduces global economic efficiency by 2% –3% yearly (USD 1.4–2.1 trillion), with individual nation costs projected at 10% of GDP (Harrigan 2014). Global food security is likely to remain a problem worldwide for the next 50 years and beyond if the world cannot formulate methods to control the situation. While agro-ecological approaches give some promise for yield improvement, increases in investment and policy reforms could significantly improve food security globally if well implemented (Manning, 2021)

According to Adams (2021), the global challenge to food security is straight forward in that the world must feed 9 billion people by 2050. USAID (2019) further establishes that food production should be 60 per cent higher than it is today in order to meet the needs of the population at that time. The UN has suggested 17 goals to end hunger, achieve food security and improve nutrition, and promoted sustainable agriculture for the year 2030. According to Kivisi (2019), food security means having access to enough food at all times, both physically and economically, to meet the dietary needs for a productive and healthy life.

Africa has been struggling in one form or another with food insecurity for almost half a century due to a number of factors including distribution obstacles, global climate change, lack of successful local agriculture and inability or disinterest to act by local officials (Warr, 2015). Although most people would concur that each of these factors carries at least some logic, there is far less international accord on the best solution to the crisis. Ever since food aid to Africa began in the late 1950s, the predicament has been characterized as a supply affair.

Inadequacy of successful and widespread agriculture in SSA led to the inability of local governments to provide enough food for their populations (Jacobs, 2015). In response, Western governments and aid organizations have sought to provide foreign food aid to SSA, in the form of imported crops from prestigious and advanced countries globally.

Nationally (Kenya), due to increased population growth food production is estimated to be lower than consumption. According to Adams (2021), annual agricultural production will need to rise by an estimated 75% from 2015 levels in order to meet consumption in 2030. In 2008, an estimated 1.3 million people in rural areas and 3.5 – 4 million in urban areas were food insecure. An estimated 150,000 persons residing predominantly in high-potential areas of the Rift Valley province were highly food insecure due to the post-election crisis.

According to Kivisi (2019), pre- and post-harvest crop losses, inadequate research-extension- farmer linkages to increase agricultural productivity, lack of mechanized methods of production as well as high costs and adulterated farm input like fertilizer, seeds, pesticides and vaccines are some of the main challenges the Big Four Agenda is currently facing in Kenya. To achieve food security and proper nutrition for all Kenyans, the government targets to increase production of maize from 40 million 90 kg bags annually to 67 million bags by 2022; rice from around 125,000 metric tons currently to 400,000 metric tons by 2022 and potatoes from the current 1.6 million tons to about 2.5 Metric Tons by 2022. In the 2018/2019 budget, Ksh. 17.9 billion was allocated for ongoing irrigation projects countrywide with a view to transforming agriculture from subsistence to productive commercial farming.

## VII. THEORETICAL FRAMEWORK

### 7.1 Empowerment Theory

This theory was developed by Rappaport (1987), and indicated that, the gate-pass towards attaining community goals was through empowering the people to ensure that they are in charge of their own problems and can influence the direction of their development process. Empowerment is a force behind attaining long lasting control, skills, methods and understanding given problems in the society. According to Ledwith and Coughlan (2005), empowerment is a process that helps people to equip themselves with necessary skills and be in charge of their own local challenges. The process also promotes creativity and innovation through which people can come up with various ways of solving their problems including food security issues in the agricultural sector.

Ledwith and Coughlan (2005), further notes that this theory can be applied to different development initiatives through the action of working together with communities for maximization of their potential and realization of sustainable change. Community empowerment also enables people to identify power structures that are responsible in promoting

change on their problems from the individual, community and policy levels (Power, 2008). The theory however, assumes that empowering farmers is likely to result into better farming practices and hence improved food security in the study area.

### 7.2 Institutional capacity factors and the implementation of food security projects/initiatives

Projects fail to achieve successful results because of the institutional capacity, the external environment, and the technological framework amongst other variables (FAO, 2010). Failure is primarily linked to the organizational context and can be attributed to the lack of leadership, organizational culture, lack of integration and lack of commitment by senior management (Nyasimi, 2013). Poor leadership skills reflect limited or no teamwork, inadequate communication and inability to resolve conflicts as well as other human related inefficiencies. Leadership affects corporate culture, project culture, project strategy, and project team commitment hence limiting the success of projects of whatever kind and magnitude (Mullins, 2005). It also affects business process reengineering, systems design and development, software selection, implementation, and maintenance.

Leadership, management styles and innovativeness have influence on implementation of projects and their success and therefore the critical role of the project manager's leadership ability has a direct correlation to project outcome (Madhu, 2006). Possessing management skills is not sufficient to be successful but integrating leadership concepts and applying logic and analytical skills to project activities and tactics allows managers to succeed (McKeon, (2014). There is an existing gap in that despite some study in the area of project management leadership, the extent to which leadership influences project success is not clear nor is the style of leadership apparent.

### 7.3 Technological practices and the implementation of food security projects/initiatives

Farmers' standards of living cannot be enhanced without transferring the technology needed by them directly in improving their food security initiatives. With the help of technology, farmers can produce more, reduce input costs and augment their income (GoK, 2012). Agricultural research and technological infusion are the keys to strengthening domestic agriculture, ensuring sustainable growth and development, reducing farm losses and augmenting farmers' incomes.

Use of technology, stress-tolerant plants, protection of plant varieties and better water management can promote implementation of food security projects in an effective and efficient manner (Ellis and Manda, 2009). Plant biotechnology can further help to address issues related to limited resources like water and fertile land, impact of climate change and growing dependence on chemicals such as fertilizers and pesticides. On average, irrigated crop yields are 2.3 times higher than those from rain fed ground (Oduor, Ngugi, Tui,

Milugo, & Ochieng, 2015). The existing gap is the extent to which technological practices influence food security project success in Hamisi sub-County, Vihiga County, Kenya.

## VIII. MATERIALS AND METHODS

Both quantitative and qualitative approaches were used in the study. The quantitative approach assisted in collecting data that could be measured to help in assessing the relationships between the variables and hence form a basis for prediction and generalization. Qualitative techniques were used to give a better understanding and a more insightful interpretation of the general results by enhancing internal validity of the study. A total of 24 producer groups in Tambua, Banja, Jepkoyai, Shiru, Muhudu, Shamakhokho and Gisambai wards in the sub-County were considered for the study within which all the producer groups were used in the study in order to establish their general perspectives on Food security in the area under study. Purposive sampling was employed in selecting key informants in the producer groups. The study adopted 3 respondents in each producer group which totaled to 72 respondents.

An in-depth questionnaire was used to gather data on various aspects related to the variables under study. The researcher visited the projects and administered the questionnaires. The questionnaires enabled the collection of the data on the two variables considered as affecting implementation of food security projects with each factors having five statements on a five scale Likert. Key Informant interviews were conducted using the interview guide among community leaders and other government officials in the sub-County. The analysis was done using both descriptive and inferential statistics based on the data collected. The first step in data analysis involved generation of statistical summaries such as frequencies, percentages and means. The simple regression analysis was used to test whether their existed a relationship between the variables. Only regression beta values (with a  $p \leq 0.05$ ) were considered as having a significant effect on food security in the area.

## IX. RESULTS AND DISCUSSIONS

Based on the data collected and analyzed, results were presented as follows;

### 9.1 Institutional capacity and Implementation of food security projects

This section analyzed data using descriptive statistics of frequencies and percentages while examining the extent to which institutional capacity influenced implementation of food security projects in Hamisi sub-County, Vihiga County. The institutional capacity factors examined were; leadership skills, management capability, project knowledge base and top level management support. A second level test of regression analysis was also done to show the relationship between independent variable and the dependent variable. Table 4.1 presents the results as shown below;

Table 4.1: Institutional Capacity and Food Security

| Statements  | Very low | Low    | High   | Very high |
|---|----------|--------|--------|-----------|
| Extent of leadership capability and implementation of food security initiatives | 6.2%     | 54.4 % | 32.8 % | 6.2%      |
| Abilities of creativity and innovativeness                                      | 6.0%     | 60.0 % | 31.1 % | 2.9%      |
| Adequacy of leadership skills and implementation of food security initiatives   | 9.3%     | 54.8 % | 32.8 % | 6.2%      |
| Management ability and implementation of Food security initiatives              | 7%       | 51.6 % | 33.6 % | 7.8%      |
| Project knowledge base and implementation of food security initiatives          | 6.2%     | 54.4 % | 32.8 % | 6.2%      |
| Top level management support and implementation of food security initiatives    | 6.3%     | 50.0 % | 39.8 % | 3.9%      |

Various dimensions of leadership capability were examined in relation to food security project success in Hamisi Sub-County. The dimensions examined included; extent of leadership capabilities, creativity and innovativeness, management's ability to make decisions, projects knowledge base by the implementers and top level management support from implementing stakeholders. The results obtained depict a 60 % low extent of leadership capability among the implementers of various food security projects in the sub-County. This means that successful implementation of food security projects with regards to leadership capability is low in the sub-County. The study further established that 66% of the implementers depicted low abilities of creativity and innovativeness, while 64.1% lacked adequate leadership skills to successfully implement the food security projects. Other factors examined under leadership were situational decision making, rewards to subordinate roles, vision and direction setting, accountability and role modeling whose extents were found to be low in the County.

Further analysis showed that 58.6% of the respondents indicated that there was a generally low management ability among the people involved in the implementation process of the food security projects. This implies that majority of those who manage the food security projects in the sub-County depict low capabilities of management. On whether the implementation teams possess effective management skills to initiate successful project implementation of food security projects, the study noted most of the respondents (63.3%) noted that implementing teams possess low managerial skills for successful project implementation.

Other dimensions of management capability explored included good communication skills, team work and strong sense of commitment as depicted by the implementers. The results obtained indicated high extent of good communication, team work promotion and 56.3% showed low extent of sense of commitment. This therefore implied that, although the project team lacks some managerial aspects and a strong sense of commitment in project implementation, but they have good



communication and team work which are important in implementation of these projects. The study noted that inabilities depicted in the leadership and management of majority of the implementers are unlikely to drive food security projects to success and may affect the projects' strategies and teams' commitments negatively.

In regard to project knowledge base, most of the respondents established that implementers of food security projects in Hamisi sub-County possessed inadequate knowledge in regard to project implementation. This implied that successful project implementation with regard to project knowledge base is low in the sub-County. The study sought further to examine whether implementers were trained before assuming implementation roles and whether their levels of knowledge, skills and attitude affected implementation. Further analysis revealed that project implementers underwent training before assuming implementation role while others affirmed that the level of knowledge, skills and attitudes can help facilitate implementers' role in project implementation process.

Further analysis on whether the organization and implementers had competencies for successful implementation of food security projects revealed that both the implementing organization and implementers have the competencies required for implementation of these projects. Majority of the respondents noted that there is organizational competence exhibited by implementers and this depicted that the implementers had necessary skills and knowledge to handle project issues. Furthermore, respondents further established that implementers had right technical competencies. This implies that the ministry concerned with these projects has sufficient technical competencies for implementation of these projects in the sub-County and therefore these aspects are unlikely to be bottlenecks to successful implementation of these projects but asset.

The research sought to establish whether there is adequate support given to these projects and implementers from the top level management and also the extent to which the support is given. Respondents noted that top level management support is low. Under top level support, the study further sought to establish whether budget allocations to these projects are adequate. Majority of the respondents indicated that the budgets given to these projects are not adequate. This means that implementers perceive budgetary allocations to these projects as inadequate and therefore could be part of the constraints affecting successful implementation of the projects in the sub-County. Further, the analysis to establish whether there was a significant relationship between the institutional capacity of the projects and food security in the sub-County was conducted and the results presented in table 4.2

The results above agree with a study conducted by FAO (2010), which established many projects fail to achieve successful results because of the institutional capacity, the external environment and the technological framework amongst other variables. The results were further supported by the findings of Nyasimi (2013), who noted that failure is

primarily linked to the organizational context and can be attributed to the lack of leadership, organizational culture, lack of integration and lack of commitment by senior management

Table 4.2: Relationship between institutional capacity and implementation of food security projects

|                        |                     |                        |               |
|------------------------|---------------------|------------------------|---------------|
|                        |                     | Institutional capacity | Food security |
| Institutional capacity | Pearson Correlation | 1                      | 0.78          |
|                        | Sig. (2-tailed)     |                        | 0.004         |
| Food security          | Pearson Correlation | 0.78                   | 1             |
|                        | Sig. (2-tailed)     | 0.004                  |               |

Table 4.2 shows that the correlation coefficient between institutional capacity and food security is 0.78 and *p*- value of 0.004. This shows that there is a strong positive correlation between Institutional capacity and food security which is very significant. This implies that organizations that have a strong institutional capacity in terms of leadership, knowledge and skills and management skills are likely to be successful in the implementation of food security projects.

9.2 Technological practices influencing success of food security projects

The study sought to establish the extent to which farming technological intervention are used in food security projects in Vihiga County. The researcher examined the extent to which irrigation; locally adapted certified seeds, post-harvest storage and green house technology are used as farming technological practices in food security projects in the sub-County. The results are presented in table 4.3.

Table 4.3: Percentage response on Technological Practices

| Statements   | Very low | Low   | High  | Very high |
|--|----------|-------|-------|-----------|
| Farmers use irrigation to improve crop production  | 6.2%     | 54.4% | 32.8% | 6.2%      |
| Farmers use certified seeds to ensure that we improve on food production                           | 9.3%     | 25.9% | 58.6% | 6.2%      |
| Farmers use the green house technology to enhance food production                                  | 6.3%     | 80.0% | 10.8% | 2.9%      |
| Farmers use the latest post-harvest technology to improve on the produce and enhance food security | 14.3%    | 71.0% | 12.1% | 2.6%      |

The results in table 4.3 shows that majority of the respondents (60.6%) established that they depend on water from flowing rivers to irrigate their crops. However, it was noted that most irrigation projects are for commercial purposes and not for increasing food crops which indicates that irrigation as a technological intervention in the food security projects implemented in the sub-County is minimal. Results from observation and interviews revealed that, crop production could be enhanced through irrigation. However, the available

rivers are not sufficient because the water flow is further affected by the rain patterns making the water levels to diminish and hence unsustainable to promote effective crop production.

Results further established that 86.3% of the respondents indicated that the green house technology use on these projects interventions is also very low in the sub-County. The projects do not use this as a technological input strategy necessary for implementation of food security projects in the sub-County. From the interviews conducted, it was revealed that though technology has been used in arid areas to enhance food production, its adoption in Hamisi sub-County is still low hence considered by many people as an expensive aspect to adopt in the implementation of food security projects.

It was further noted that 58.6% of the respondents established that there is a high degree of locally adapted certified seeds as a technological intervention in food security projects. It was further established that the targeted seeds were the drought tolerant varieties from Kenya seed, One acre fund and other agencies. This was one of the main interventions that was noted to have been adopted widely by most projects in Hamisi sub-County. A similar view was obtained from the interviews and observation where seed technological practices adopted had an effect on the successful implementation of food security projects in the sub-County.

Further analysis revealed that there is low adoption of latest post-harvest technologies. 84.3% of the respondents noted that the latest post-harvest technologies like hematic bags were too expensive to be acquired by most farmers. As part of the technological input in food security projects, post-harvest handling adoption has been very minimal in the sub-County. The results of the correlation between technological practices and food security are presented in table 4.4.

The results agree with the findings of Ellis and Manda (2009), who noted that use of technology, stress-tolerant plants, protection of plant varieties and better water management can promote the implementation of food security projects in an effective and efficient manner. Oduor, *et.al*, (2015), further establishes that plant biotechnology can further help to address issues related to limited resources like water and fertile land, impact of climate change and growing dependence on chemicals such as fertilizers and pesticides. On average, irrigated crop yields are 2.3 times higher than those that depend on rain.

Table 4.4: Relationship between technological practices and food security

|                         |                     | Technological practices | Food security |
|-------------------------|---------------------|-------------------------|---------------|
| Technological practices | Pearson Correlation | 1                       | 0.66          |
|                         | Sig. (2-tailed)     |                         | 0.002*        |
| Food security           | Pearson Correlation | 0.66                    | 1             |
|                         | Sig. (2-tailed)     | 0.002*                  |               |

Table 4.4 shows that the correlation coefficient between technological practices and successful implementation of food security projects is 0.66 and P- value = 0.002. This indicates that there is a strong positive correlation between technological practices and food security which is statistically significant.

### 9.3 Regression Analysis

A second level analysis was performed to determine the significance and magnitude of the effects of the independent variables (Institutional capacity and technological practices) on the dependent variable (successful implementation of food security project) in Hamisi sub-County, Vihiga County, Kenya. The results are presented in table 4.5.

Table 4.5: Multiple Regression Analysis

| Model | R                 | R Square | Adjusted R Square | Change Statistics |     |     |               |
|-------|-------------------|----------|-------------------|-------------------|-----|-----|---------------|
|       |                   |          |                   | F Change          | df1 | df2 | Sig. F Change |
| 1     | .568 <sup>a</sup> | .322     | .282              | 8.081             | 4   | 68  | .001          |

The results show that the combined effect of the independent variables (Institutional capacity and technological practices) on implementation of food security projects in Hamisi sub-County was moderate (R=0.568); (R square =0.322). This implies that the success in the implementation of food security projects can be explained by a 32.2% change resulting from better institutional capacity and technological practices among organizations that are involved in the implementation of such projects. The effect is seen to be very significant given that the p- value of 0.001 is less than 0.05.

Table 4.6: Coefficient of Variations

| Model                   | Unstandardized Coefficients |            | Standardized Coefficients | t     | Sig. |
|-------------------------|-----------------------------|------------|---------------------------|-------|------|
|                         | B                           | Std. Error | Beta                      |       |      |
| (Constant)              | 3.810                       | .652       |                           | 2.775 | .007 |
| Institutional capacity  | .375                        | .142       | .178                      | 3.229 | .023 |
| Technological practices | .468                        | .112       | .489                      | 4.193 | .000 |

a. Dependent Variable:

The results show that both institutional capacity and technological practices have a significant effect in the implementation of food security projects in the study area. Further analysis shows that institutional capacity contributes to implementation of food security projects by 37.5% while technological practices contributes to the successful implementation of food security projects in Hamisi sub-County, Vihiga County by 46.8%.

## X. CONCLUSIONS AND RECOMMENDATIONS

### 10.1 Conclusions

The study concluded that majority (61%) of the respondents were the view that, implementers of food security projects in Hamisi sub-County depicted low extents of leadership capabilities. However, a good percentage of the respondents had a different view that the implementers have high leadership capabilities. Further findings revealed that very few of the respondents felt that the implementers are creative and innovative and that the implementers possess the necessary leadership skills to implement food security projects in the sub-County successfully. On management capability as part of institutional capacity, the findings revealed that the majority implementers depicted low capabilities. This implies that the majority of those who manage the food security projects in the sub-County depict low capabilities of management.

In addition to the above, further analysis on other management characteristics perceived to be positive drivers of successful project implementation like strong sense of commitment revealed that there was serious inadequacy of sense of commitment from the implementers of these projects. Project knowledge base on food security projects' success showed that most of the respondents confirmed that the extent of project knowledge base of implementers in Hamisi sub-County is low. This means that there is low top level management support to these projects as revealed by the study results.

On technological practices, most of the respondents said that the extent of water availability for irrigation in the sub-county is inadequate. This means that irrigation as a technological input in the food security projects implemented in the sub-county is minimal. On the use of improved seed varieties, it was revealed that use of locally adapted seeds yielded higher returns to the farmers. It was established that, whereas technological practices are vital for the food security projects success, they are lowly applied in the implementation of food security projects hence making them unsuccessful.

The study further concludes that institutional capacity has a strong positive effect in the implementation of food security projects in Hamisi sub-County. The correlation coefficient between institutional capacity and implementation of food security is 0.78 and p-value = 0.004. This shows that there is a strong positive correlation between institutional capacity and successful implementation of food security projects in the sub-County and it is significant. It was also established that there was a correlation between technological practices and implementation of food security projects with  $r = 0.66$  and P-value = 0.002 indicating that there is a strong positive correlation which is statistically significant between technological practices and implementation of food security projects in Vihiga County.

It is further concludes that that determinants of food security projects' success in Kenya generally and in Hamisi sub-

County, Vihiga County are varied and many. This study focused on two of these factors; institutional capacity and technological practices. The study therefore concludes that the success of food security projects generally in Kenya and Hamisi sub-County in particular are far from being realized probably due to institutional capacity factors. Further, the failures could be due to Technological practices adopted as they had a significant relationship to implementation of food security projects success. In general, the study concludes that despite improvements in food security projects implementation strategies and methodologies, many are not able to achieve their objectives because of institutional capacity and lack of appropriate technological practices. Lastly, the study notes that whereas the aforementioned factors have an impact on food security projects, it is prudent to note that other factors that were not part of the study still influence food security generally

### 10.2 Recommendations

Based on the results of the study the following recommendations are made for future success of food security projects in Hamisi sub-County;

On institutional capacity factors, the lead agencies/ organizations of food security projects should endeavor to enhance projects' management capabilities that can sustain and advance their competitiveness in combining, mixing and expanding on past experiences.

For the technological practices, the study recommends that more focus should be put on use of technologies in order to realize success in implementing food security projects for sustainable food security globally and in the study area'.

There is need to Link food security debate with the Vision 2030 and the Big four agenda. The Kenya Vision 2030 is a national economic blueprint that entrenches the long term development strategy for Kenya. It aims at transforming the country into a modern, globally competitive, middle income country providing a high quality of life to all its citizens. The Vision is anchored on the economic, social, and political pillars. The economic pillar aims at achieving an annual 10% average sustainable economic growth by the year 2030 and generate more resources to reinvigorate the economy to meet its envisaged goals and aspirations. Under the economic pillar, sustainable food security initiatives are inherently domiciled in it.

The study further recommends transformation of key institutions in the agricultural sector in order to promote agricultural growth by increasing productivity of crops, introduce land use polices for better utilization of high and medium potential lands, develop more irrigable areas for crop production and improving market access for our smallholders through better supply chain management.

There is need to promote sustainable land use practices since the current land use practices in the country are incongruent with the ecological zones. For instance, large portions of land



in high potential areas have been sub-divided into uneconomic parcels, while some parts of land in the medium and low potential areas are rapidly being converted into agriculture; despite the fragile environment they are located in unproductive livelihood zones

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