

**STAKEHOLDERS ASPECTS INFLUENCING THE IMPLEMENTATION OF
FOOD SECURITY PROJECTS IN VIHIGA COUNTY**

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**A thesis submitted to the School of Public Health Biomedical Science and
Technology in partial fulfilment of the requirements of the award of the degree of
Master of Science in Public Health Nutrition of Masinde Muliro University of
Science and Technology**

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DEDICATION

This thesis is dedicated to the Almighty God, my family, and my friends who have constantly supported me throughout my study.

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ABSTRACT

Food security mostly depends on the growth and distribution of nutritious foods. Approximately two billion of the eight billion people worldwide are food insecure. In Kenya, food security has been a great challenge due to natural hazards, conflict and population growth over time. This study sought to identify the existing and distribution of agriculture and nutrition projects supported by stakeholders in Vihiga, the link between agriculture and nutrition goals on food security, factors influencing the implementation of food security projects, and the impact of public policy on food security. A descriptive cross-sectional design was adopted, employing mixed method of data collection. The study purposively selected thirty stakeholders, consisting of ten farmers and ten community health volunteers (CHVs) who provided qualitative data in two focus group discussions (FGD) as well as ten sessions of key informant interviews (KII) with individual stakeholders. The themes formed from the qualitative data were analysed thematically and manually, and verbatim quotes were used to explain the findings. Additionally, two hundred and seventy-three (273) structured questionnaires were used for quantitative data. The results were analysed using (SPSS) version 20. The data revealed that the main agricultural project was; National Agricultural Rural Inclusive Growth Project (NARIGP) majoring in Dairy, Local Chicken, Banana, and vegetables. (75%) of farmers were beneficiaries of these programs where (48%) were supported by indigenous vegetables while a small number of them (4%) were engaged in Dairy farming. There was a misconnection between nutrition and agriculture linkages on food security. The study found that the priority for agriculture is income generation, rather than household consumption. Agriculture is essential to nutrition, but that connection is overlooked. Poor collaboration was found to be among the factors influencing project implementation. This contributed to unequal program coverage which posed as obstacle in aligning agricultural projects with local nutrition demands. Limited land ownership presents a challenge for smallholder farmers' ability to meet both income and nutrition needs, as approximately a third of surveyed (n=97, 35.5%) reported owning less than 0.5 acres of land while (n=59, 17.6%) had 2 acres and above. Moreover, although food and agriculture policies are in place, gaps still exist in adhering to these policies. It was revealed that budget allocation to the agriculture sector is at (2.4.%) which is still a quarter way to the international commitment of (10%). The study recommends that farmers be trained in intensive agriculture technology to help produce more from their small plots. The stakeholders should develop strategies to collaborate on specific projects related to agriculture and nutrition for example through strengthening existing positive relationships. The County should work to embrace inclusivity in policy formulation. Fast

track the development of the County Agri-nutrition strategy to promote the integration of nutrition into agriculture programs and vice versa.

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ABBREVIATIONS

ALVP:	African local Vegetable programs
ASDSP:	Agriculture Sector Development Support Programs
ANI:	Accelerating Nutrition Improvements
CSFIP:	County subsidies farm input program
CHVs:	Community Health Volunteers
FSB:	Food Security Bill
MOA:	Ministry of Agriculture
MOH:	Ministry of Health
NARGIP:	National Agriculture Rural Inclusive Growth Project
NGO:	Nongovernmental Organization
ROP:	Rural Outreach Program
SDGs:	Sustainable Development Goals
SRA:	Strategies for Revitalizing Agriculture
SOFDI:	Sustainable Organization Farming and Development Initiatives

OPERATIONAL DEFINITION OF TERMS

Agriculture- is the cultivation of animals and plants for food, fibre, biofuel and other products used to sustain human life.

Stakeholders: A team of people, organizations or institutions with direct or indirect interest or role, and affect or affected by a project.

Nutrition-sensitive agriculture; is defined as a system-based perspective that focuses on agricultural production systems as a way to promote the nutritional status of households and individuals.

CHAPTER ONE

INTRODUCTION

1.1. Background of the study

Food security mostly depends on the growth and distribution of nutritious foods. Approximately two billion of the eight billion people worldwide are food insecure (FAO 2022). Adams (2021), stated that the world's concern for food security is that it must feed nine billion people by 2050. USAID (2019) further found that the production of food should be 60 per cent higher than today to attain the needs of the population at that time. The United Nations has suggested 17 goals to end hunger, improve food security and nutrition status as well as advance sustainable agriculture for the year 2030 (Chege et al., 2016).

For almost half a century, Africa has straggled with food insecurity issues contributed by several factors including distribution challenges, continuous climate change, little success in agriculture and inability and lack of interest to act by local officials (Warr, 2015). There is still no good solution locally or internationally that has been found to curb the disaster. From the time food aid started in Africa in the 1950s, the difficult situation has been described as a supply affair (SFSNW, 2022).

Food security will be subjected to more pressure as the global population gets to nine billion by 2050. Additionally, climate change interferes with crop production, increases

the spread of pests and diseases, changes in weather patterns, and cultivation seasons (Ministry of Agriculture Livestock and Fisheries, 2020).

The outbreak and spread of Covid-19 added to the challenges of shared focus to curb food insecurity (FAO 2020). About 720 and 811 million people starvation in 2020. This was an additional one hundred and sixty-one (161) million more than that of 2019. This situation greatly accelerated the Covid-19 emergency. (FAO 2022).

Improving food security and eradicating poverty continue to be the number one concern of the international development goal (Demeke et al., 2016). A big number of the poor people in the globe are small-scale farmers who largely rely on agriculture as the main source of livelihood. Simultaneously, agricultural advancement is among the top pathways to stop food insecurity issues (McLennan & Group 2022).

Climate change is increasing food insecurity in sub-Saharan Africa (SSA) with long-lasting impacts on economic growth and poverty elevation (Baptista & Farid, 2022). The war in Ukraine and the COVID-19 outbreak have led to an increase in food prices and reduced incomes that contributed to increased suffering from food insecurity. It is estimated that about thirty (30) per cent to one hundred and twenty-three (123) million of SSA's population are affected by food insecurity (The Economist Group, 2022). It requires keen policy prioritization in financing and capacity building to address the

resilience to changes in climate that continue to down grade food security improvement efforts in SSA (Fuglie et al., 2020).

In Kenya, expertise is frequently brought in to assist in agricultural development through training, research, and facilitation of the movement of knowledge with materials (Vihiga County Plan, 2022). The stakeholders' support of agriculture and nutrition has been reported to have highly enhanced agricultural productivity, however, the level of stakeholders' support and increase in food security are not commensurate (Ndirangu, 2016). The Kenyan agriculture sector put up to 51% of Kenya's GDP and makes up for 60% of the country's employment (Birch, 2018). Eighty (80%) of the total population in Kenya resides in rural areas, where they depend on local agriculture for food and/or income. Despite living in an agricultural-based economy, a quarter of the Kenyan population suffers from food security problems (Waage et al, 2013). Implementing better agriculture and nutrition policies, in addition to continuous development programs, could improve food security in the country (Ministry of Agriculture, 2019). Investments in agriculture demonstrate good outcomes in poverty alleviation and increase productivity (GNR, 2017). Yet policy failure and structural rigidities limit policymakers' ability to act (Mohamed, 2018).

Kenya's crop production is viewed as the most common income stream for both the Country, Vihiga county and individual households. Approximately 64% of the income in Vihiga is derived from the agriculture sector (Asena et al 2017., Vihiga County

Plan,2018). However, agricultural produce is still below its potential output and keeps decreasing over time. Vihiga County is not self-supporting in producing enough food. Other regions supply most food in the County.

Food insecurity in Vihiga county is connected to low agricultural production, irregular rainfall (Pelto & Thuita, 2016). For example, the current estimate of maize production in Vihiga County is 4 bags per acre but its prospective produce per acre is 15 bags. Other Contributing factors to low productivity include reduce soil fertility and the use of outdated methods of farming (Birch, 2018). This is compounded by continuous land subdivision, lack of credit access, expensive inputs, poor access to extension services, and soil erosion. Lastly, the impacts of climate change which include changes to rainfall and temperatures have drastically reduced agricultural productivity for crop and livestock production (World Bank 2020). Consequently, farmers are not able to acquire their annual food needs. This study sought to identify stakeholders who are influential on Vihiga County's food security it analyzes their influence in the implementation of food security projects in Vihiga County, Kenya

1.2. Problem statement

Global food insecurity is rising despite the existence of initiatives to curb the issue (Turner et al., 2013). There have been several food security projects in Vihiga county and this is expected to affect the food security status but poverty and food insecurity issues have

continued to be one of the biggest socio-economic problems for many householders in the county to date. (Lawrence & Omuse, 2021).

The implementation of agriculture and nutrition projects and policies related to food security has not done much to improve productivity in agriculture as the County receive moderate to high rainfall (Birch, 2018). The current estimate of maize production in Vihiga County is 4 bags per acre but its potential produce per acre is 15 bags (Birch, 2018)The adaptation rate of households and farmers to self-reliance on food production has not been adequate (Chege et al.,2016).

Many of the farmers who are beneficiaries of the food security project interventions have often not been able to remain independent to continue with farming without support after the projects come to an end of the target period and achieving food security has remained to be a big challenge. (IFAD, 2014). There are still high budget allocations to emergency relief food and reliance on other regions to supply food in Vihiga County. There could be constraining factors for implementation, this study sought to identify stakeholders who are influential on Vihiga County's food security by analyzing the types of programs, the link between agriculture and nutrition goals, factors influencing the implementation of these programs, and the impact of public policy on food security.

1.3. The study Objectives

1.3.1. Broad Objective

The main objective of this study was to determine Stakeholders' aspects in influencing the implementation of food security in Vihiga County, Kenya

1.3.2. Specific Objective

The specific objectives of this study were to:

- i. Identify the existing and distribution of agriculture and nutrition projects.
- ii. To assess the linkage of agriculture and nutrition projects on food security.
- iii. Identify the factors influencing the implementation of food security.
- iv. Examine the reasons for agriculture and nutrition policies failures in the realization of food security

1.4. Research Questions

- i. What are the existing and distribution of agriculture and nutrition projects?
- ii. What is the linkage between agriculture and nutrition programs on food security in Vihiga County, Kenya?
- iii. What influences the implementation of food security projects?
- iv. What are the reasons for agriculture and nutrition policies' failures in the realization of food security?

1.5. Justification of the study

The Kenyan agriculture sector put up to 51% of Kenya's GDP and makes up for 60% of the country's employment (Ministry of Finance, 2012). Eighty (80%) of the total population in Kenya resides in rural areas,. Despite living in an agricultural-based economy, a quarter of the Kenyan population suffers from food security problems (Faso et al., 2015).

The agriculture sector consists of small-scale farmers. The growth rate in the sector is picking up slowly and almost 50% of Kenyans fall below the poverty range. Food insecurity is part of the poverty indicators that can be addressed by proper project implementation and advancement in agricultural practice methods (Ministry of Finance, 2012). Vihiga County has organizations supporting agriculture and nutrition but productivity is unclear the county also imports most of its food from other regions (Lawrence & Omuse, 2021).

Vihiga County is among the 21 counties that benefited from NARIGP to increase agricultural productivity and improve food security status among the selected counties. (Integrated & Plan, 2018). Vihiga County has had an unusual reduction in maize productivity in recent years making it difficult to attain food security (Cholo et al., 2019). Agricultural and nutrition projects upon nutritional outcomes has not been demonstrated (Poole et al., 2018). Evidence of linkages between agricultural policy and nutrition from other studies is limited.

1.6. Significance of the study

The results of this study may contribute to support of the attainment of SDGs number 2, 12 and 17 which are zero hunger, responsible production and consumption and partnership for goals respectively. It may further help in the promotion of one of the big 4 agendas which is food security supported by the government of Kenya.

This study might also help to locate gaps in project coverage, services offered and plans for allocated funding in the county as well as build collaboration and synergy among stakeholders to promote effective agricultural and nutrition programs. Additionally, the study may help in monitoring ongoing nutrition and agricultural actions and available resources and systematize and harmonize the resources provided by stakeholders involved in nutrition and agricultural project implementation.

Lastly, the study findings might enable policymakers to objectively make and implement policies that would expand enabling surroundings for sustainable project implementation and engage other stakeholders in the development of projects. The study may contribute new and additional information to the existing literature on food security.

1.7. Scope of the study

This study was conducted in Vihiga County within Hamisi and Vihiga sub-counties. The respondents were stakeholders who supported nutrition and agriculture projects labelled

as top-level stakeholders and beneficiaries of these projects labelled as lower-level stakeholders. The study was to determine Stakeholders' aspects in influencing the implementation of food security in Vihiga County, Kenya

1.7.1. Limitations

The extensive coverage of this study was limited by the topographical stretch of Vihiga County, time and schedules for meetings, and financial barriers as well as limited previous data on the subject in the county. Was also dependent on the willingness of participants to give information in the KII, FDG and questionnaires that were all used in gathering data.

1.7.2. Delimitations

The study was delimited to stakeholders who specifically supported agriculture and nutrition programs in Vihiga County as a way of promoting food security. It majorly focuses on stakeholders from the Ministries and NGOs, Farmers and Community health volunteers. The study was also delimited to Vihiga County only and the findings cannot be generalized to other stakeholders in other counties and ministries.

1.8. Theoretical Framework

Empowerment Theory

The theory was evolved by Rappaport (1987). He said that the way to achieve any goal in the community was through capacity building to make them at the centre of their challenges and enabled them to choose the direction of their development process. Empowerment is a push behind gaining long-lasting skills, knowledge, information and understanding of given problems in society (Lawrence & Omuse, 2021).

Empowering the community is a goal to raise awareness and commitment to the potential of the community to understand, identify, maintain, promote and improve their wellbeing (Lawrence & Omuse, 2021). Grouping people in the community proves to be one of the ways to empower them, especially intending to execute project implementation. This has been one of the solutions for farmers to be more efficient in agriculture projects to improve food security. (Boedecker et al., 2021). This theory is used in this study to relate how stakeholders can help the community especially farmers to improve agriculture for food security as they are engaged in the various agriculture and nutrition projects.

Community Empowerment improves inventively and innovation where farmers generate ways of solving their agriculture-related challenges to improve productivity and promote food security (Fares et al., 2021). This theory can be used for various evolving initiatives through the plan to work together with communities for them to maximize their potential and realize a lasting solution to improve livelihood. The theory can as well enable people to know the power flow that is in-charge in promoting changes from the individual, community to policy levels. (Orts & Strudler, 2009).

There are broad empowerment systems of food security according to Suharyanto (2011). They include; sufficient food availability, easy and fare food distribution as well as food and nutrients consumption. All this has a huge impact on the nutritional and food security status of the community. This theory presumes that empowering farmers through training, new agriculture technology, proper seeds and fertilizer option and engaging them in projects as beneficiaries would likely result in improvement of agricultural productivity and better choices of nutritious food intake.

1.9. Conceptual Framework

The study presents food security as the dependent variable. The independent variables are stakeholders who are the policy makers, implementers and beneficiaries of projects, Agri-nutrition linkages (farm on production and consumption, income and food intake); and factors influencing programs implementation (land size, collaboration, program coverage and distribution and knowledge

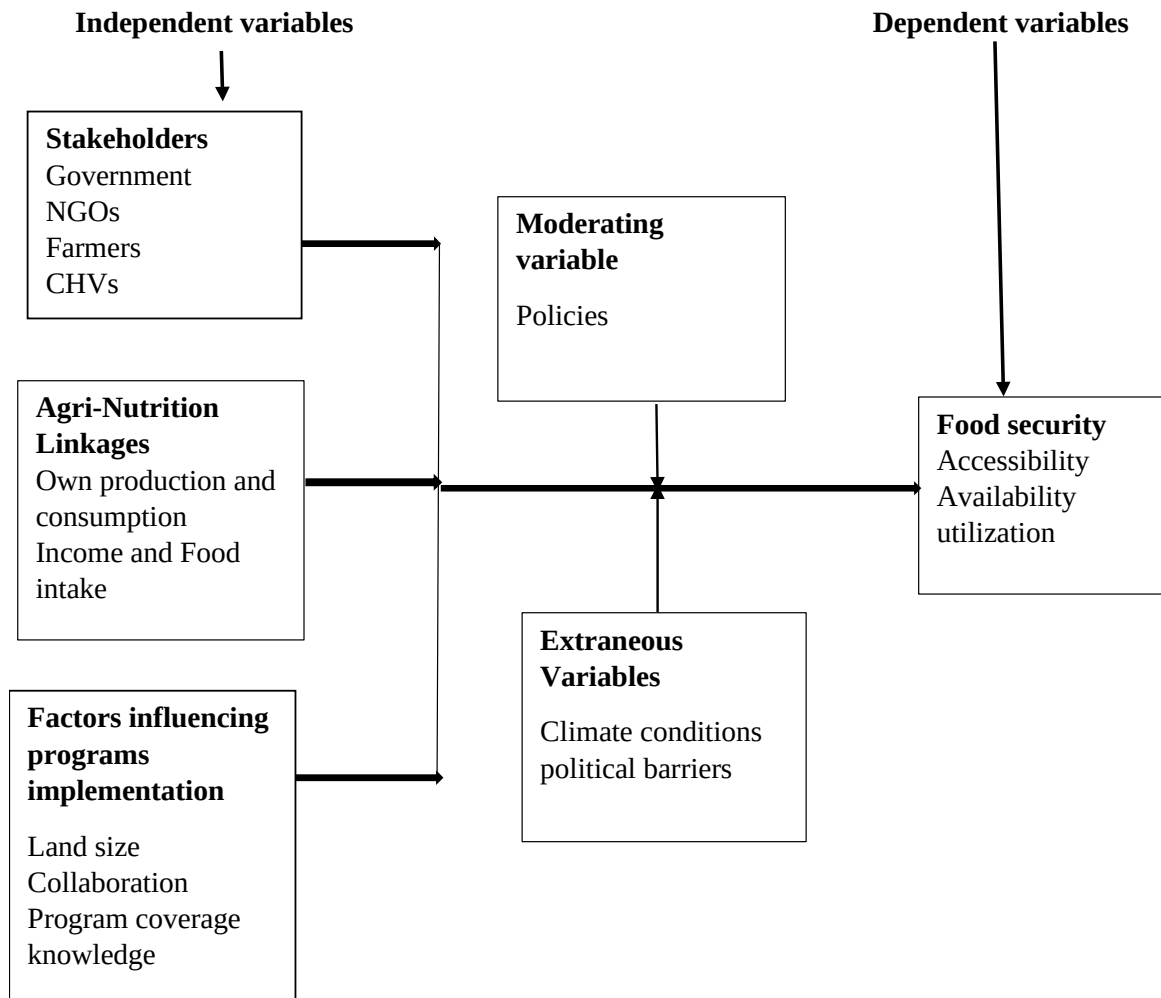


Figure 1. 1. Conceptual framework

CHAPTER TWO:

LITERATURE REVIEW

2.1 Introduction

The chapter reviews literature from other studies with similar or related fields of study in prior years.

2.2. Agriculture/ nutrition projects and food security

Several stakeholders have brought in experts to assist in training and research, as well as facilitating the movement of knowledge with materials for nutrition and agricultural research and development (Integrated and County Plan 2018). The stakeholders' support of agriculture and nutrition has tremendously enhanced agricultural productivity while helping improve the country's food security (Tounkara et al., 2019). However, the level of stakeholders' support and level of food security is not commensurate (Saint Ville et al., 2017).

Most of these policies and programs have been supported by stakeholders at different levels to improve food security but we are still worried by the fact that food security issues are still a big stumbling block. Vihiga county development plan shows some projects have been prioritized such as the NARIGP, ASDSP, and (KALRO) (KCCR, Vihiga County, 2020). Four major value chains were supported in these projects; AIVs, indigenous chickens, dairy, and bananas (KCCR, Vihiga County, 2020).

In Vihiga County, several projects are working on issues related to changes in climate, agriculture and nutrition programs, and food security (Integrated & Plan, 2018). Their input included; research activities, community empowerment, improving market links, providing credit services and to provide of agro-inputs such as seeds, seedlings, chicks,

fertilizers, and pesticides (KCCR, Vihiga County, 2020). The table below from the Vihiga county climate risk profile shows interventions related to food security projects

Table 2. 1. Current Projects in Vihiga

Stakeholders	Interventions	Challenges
Ministry of Agriculture	• Farm demonstration about • New crops • New technologies of agriculture	• Coordination is poor • Duplication and roles overlap • Lack on enough human resource
One acre fund	• Fertilizers and seeds • Train and finance farmers	• Inadequate human resource • Unequal distribution of inputs
Rural Outreach Program (ROP)	• Provide Seeds and Training to farmers who deal with African indigenous vegetables	• Inadequate human resource • Few farmers benefit
Welt hunger hilfe	• Extension services and Training of farmers who practice dairy farming	• General information not related to policy • Inadequate extension officers. • Most farmers are not able to access information

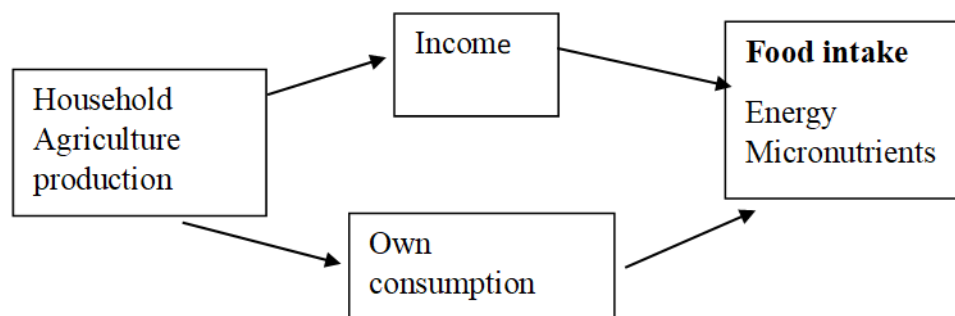
2.3. The linkage between agriculture and food security

A lot of focus has been given to the linkage between agriculture and nutrition in the growth sector at large (Masset et al. 2012). These linkages may seem obvious in that; we eat and get nutritious food from agricultural produce. However, the statement that agricultural production can improve nutrition has not had clear evidence to support it. (Girard *et al.* 2012). Agriculture plays a big role in nutrition and food security, even though it does not improve nutrition, its prospective to do so is incontestable.

Agricultural advancement is required to progress in a way that utilizes the chances to promote healthy and nutritious food and improve nutrition (Hodge et al., 2015a). Nutrition-agriculture linkages explain the set of connections that indicate the reliance on health, nutrition, and agriculture (Hodge et al., 2015a). Whenever there is a change in health/nutrition status, it is therefore highly expected to affect agricultural productivity. The opposite is the same, changes in the agricultural sector are likely to affect individual health/ nutrition status. (Chung et al., 2012). Agriculture is the major employment for the poor. Food expenses take the biggest budget share of poor households (IFAD, 2014).

Agriculture has got a high potential to impact communities. Its advancement is required to progress in a way it improves health and nutrition. Health and nutrition are conversely expected to improve agriculture (Waage et al., 2013). The challenge is where the stakeholders separate these roles by sector and do not create partnership opportunities. Additionally, most development experts are sectoral specialists. They are not properly equipped to run projects for outcomes that are not based on their area of specialization (Varela et al., 2022). It is therefore hard to introduce projects and policies that combine the goals of two different sectors.

In Figure 2.2 below, Haddad (2020) explains that food production at the household level is anticipated to improve farmers' food intake through their farm consumption or income for purchase. Improve intake of nutritious food provide the energy needed for activities, growth and body maintenance.



2 3. The link between Agriculture, consumption, income and food intake

Food production affects the quality and availability of food to be consumed in a household. (IFAD, 2014). Additionally, it further impacts food prices in local markets. Households that practice farming do not produce all foods that could meet their dietary needs. They also do not consume all of what they produce (Fuglie et al., 2020, Haddad, 2000).

An overview of the Nutrition-Sensitive Agriculture pathways is illustrated in Table 2.2. The table indicates agriculture pathways, description, key components and references. It illustrates the way agriculture as a source of food can affect nutrition outcomes.

Table 2. 2: Nutrition/ agriculture pathways

Pathway	Description	Key elements	References
1. Agriculture for food used	food for household consumption	i. Agricultural activities ii. Agri-inputs (seeds, fertilizers, pesticides) iii. Agriculture	(Alpha & Gebreselassié, 2015) (Sokoya, et al., 2014) (Waage et al., 2013)

		technologies iv. credit	(CFS, 2015)
2. Agriculture for income	Income for food and non-food use	i. Value chain (AIV, Dairy, Poultry, Banana farming) ii. Food quantity iii. Prices of food iv. Agri-food trade	(Sawicka & Hameed, 2015) (FAO 2021)

At the World Economic Forum conference (2010), stakeholders from Kenya, Uganda and Ethiopia pointed out that agriculture provides both food and income. (Hodge et al., 2015a) further emphasized the importance of provision through food cultivation saying that the major crop produced in the three countries are less and cannot meet their nutrient requirements.

Griffith and Watson 2016 said that agriculture as a livelihood provides enough income that can impact the type of food intake in households. The above statement was confirmed in another study by Alpha & Gebreselassié, (2015) that the improvement of nutritious food in agricultural produce would promote the intake of diversified nutrient and affects food security. Production for own consumption is more effective at enhancing nutritional status because the farmers' factor in their own dietary needs. If they then choose to sell the surplus, they will retain the benefits. That said, there is a great linkage between agriculture and food security.

High support for agriculture programs exists but the linkage to food security is not clear. This research will help to develop informed strategies on how to connect them. The realization of the linkage will motivate stakeholders and farmers to promote and support agricultural programs that help improve the food security status

2.4. Factors influencing projects to improve food security

2.4.1. Collaboration

Stakeholders' collaborations are the coming together of different stakeholders to build synergy by identifying common goals, promoting interaction, learning towards joint action and creating new agriculture programs and services to promote food security. According to a study by (Saint Ville et al., 2017), collaboration among stakeholders is a challenge and there is a lack of coordination mechanisms to ensure multi-sectoral collaboration and implementation of programs and many of the stakeholders want to run their programs. In another study by Hodge et al. 2015, it was stated that collaboration among stakeholders plays a big role in supporting projects in a wide range rather than operating at individual bases. Financial and human resources are weak and not sufficient to facilitate proper collaboration among stakeholders (Gelli et al., 2015). Mockshell & Birner, (2015) state that improving the quality of collaboration and interaction among stakeholders has the potential to better implementation of programs.

Stakeholder collaboration can help in the development of a mutual understanding of the issues, challenges and solutions to problems. They can work together towards the achievement and implementation of projects (Gondor & Morimoto, 2011). Additionally, the study states that Collaboration can be achieved through trust and objective engagement to accomplish a wide common purpose. Stakeholder collaboration can open room for a great approach to responding to challenges that stand-alone efforts cannot sort. This study assumes that Collaboration will succeed when there is an opportunity and initiatives for negotiation. Stakeholders to support each if they will need to achieve both individual and shared goals. The collaboration will tend to be efficient when the outcomes of not collaborating are poor utilization of available resources to support programs, ignorance of agriculture and nutrition linkages or worsened relations among stakeholders (Hodge et al., 2015a). There are however few researches published in the area of stakeholder collaboration and this study will help to capture more information on collaboration by stakeholders in managing and supporting programs.

2.4.2. Knowledge, Skills and Training

Knowledge and skills given to farmers and other stakeholders about agriculture and nutrition programs, and farming methods among others will lead to improvements in agriculture productivity and improvements in nutrient intake (Mbwana et al., 2017). The finding is also supported in another study by Hameed & Sawicka (2016) that training and proper education play a big role in influencing nutrition and agriculture programs to

improve food security. Sokoya, Alabi, and Fagbola 2014, observed that education, training and interpersonal connectivity between farmers and stakeholders will enhance farmers' information literacy, knowledge and awareness of current trends in farming, and the existence of various agricultural and nutrition programs. People get to acquire skills that help them in problem-solving, (Hameed & Sawicka, 2016).

Training is also important to help farmers to adopt new ways of farming with the raising challenges of climate change (Wiggins et al., 2010). Climate change has effects on the development of agricultural produce and thus affects its demand (Asena et al, 2017). The effects have brought about global food security issues, dependence on imported food products and increasing the already hazardous conditions for the population (Turner et al., 2013). As an example, now Kenya is failing to produce satisfactory and is currently importing food supplies from neighbouring countries (Kenya National Bureau of Statistics, 2018). The combined effects of climate change, reduced land and poor technology in agriculture may cause anticipated harvests to be 5–30% short of demand by 2050 (Gwada et al., 2020).

In Africa, agricultural information is most often delivered by agriculture extension officers. According to Maestre et al., 2017a the approach they use does not specify information based on agrosystems (Gwada et al., 2020). They are most active when there is new information to give especially on technology once most farmers are informed

about it the extension drives wear out and farmers miss opportunities to consult more (World Economic Forum, 2010).

In a study by FAO 2021, the main target of extension services is information and communication only and they are not connected with the development projects, policies and strategies. This situation creates a communication gap that always affects productivity. It slows down farmers' efforts to work towards improvement in agriculture productivity (Gelli et al., 2015). Mockshell and Birner 2015 observed that different stakeholder also shows key interest in improving extension services for farmers to have the diverse option to access agricultural information. The challenge of extension services is poor motivation and lack of facilitation to reach the farmers in time. This in turn affects the service offered to the farmers (Nyakoyo & Odhiambo, 2020).

2.4.3. Size and division of land

The high population rate of Vihiga County has put pressure on land availability. This has led to continuous land subdivision thus, reducing the economic use of land for agricultural purposes (County Government of Vihiga, 2019). At the moment, the population density in the county is 1153 per square kilometre with the density expected to hit 1,843 per square kilometre by the year 2030.

Most farmers do not own flat lands (Mota et al., 2019). Agricultural production in the county is rain-fed and is at risk of being influenced by changing climate leading to low crop production (Asena et al., 2017). The outbreak of pests and diseases has increased the

problem (Kenya National Bureau of Statistics, 2018). A lack of title deeds for the majority of farmers who are women blocks access to the resources necessary to enhance crop and livestock productivity (County Government of Vihiga, 2018).

Many credit firms issue financial assistance to farmers who have credible documents for the parcels of land that they purport to own. Without a title deed, there is no access to financial assistance hence a disappointment to the farmers and the agricultural sector (ASDSP, 2014). There is massive environmental degradation resulting from farming practices that are not environmentally friendly including encroachment into environmentally delicate areas by people such as river banks. (County Government of Vihiga, 2018).

2.5. The existing gap in Agriculture and nutrition policies

Agricultural and nutrition-related policies can have major effects affects programs implementation. The agricultural and food insecurity issues is mostly connected to poor implementation. Policies related to agriculture, nutrition and food security are to guide how to achieve them and curb the challenges of food insecurity. The endless occurrence of food security issues as well as the lack of adequate food for everyone in Kenya has posed an insignificant impact on the existence of most policies .

2.5.1. Policy review

2.5.2. The New Constitution (2010) specifically article 43 (1) (C)

It acknowledges the right to adequate food as a basic and important right of citizens. (The Government of Kenya, 2010). The country is still far from this law and many Kenyans are suffering because of food insecurity.

2.5.3. The Kenya Vision 2030

The vision aims that by 2030, we will have a competitive world with a prosperous nation enjoying a high quality of life. Agriculture is targeted as the main economic pillar towards the realization of this vision. (The Government of Kenya, 2010)

2.5.4. Food and Nutrition Security Policy (FNSP) 2005-2011

The major goal of this policy was to ensure food and nutrition security for all Kenyans. This policy was to be achieved through sharing and relating with the (ASDS) that was formed in 2010 (Strategy, 2019). The policy was also to be put into operation by the (NNAP) that was formed in 2012. The main aim was to implement nutrition-sensitive food security intervention. There was no proposal on nutrition-sensitive agricultural interventions for both ASDS and NNAP and there was no harmonization. Additionally, there was no presentation of specific plans in favour of small-scale farmers.

2.5.5. Maputo Declaration, July 2003

This declaration was a Commitment for African nations to commit 10 % of the national budgetary allocation to agriculture. This was to accelerate the increase of agricultural growth up to 6% per year (African Union, 2003). Kenya has not lived up to this declaration and currently, its investment is pegged at 2.4% of the national budget which is still a quarter way to the international commitment of 10%. In the 2022/2023 budget, the government has allocated 378.4 million USD to the sector, a decrease from 564.9 million

USD in the 2021-2022 period. Agricultural growth rates are still below 6% (Deloitte, 2022)

2.5.6. Big 4 Agenda Strategies (Food Security)

The agenda on food security as one of the big 4 was to focus on the goal that would ensure 100 per cent Food secured to all Kenyans. It was to be achieved through expansion of food production, value addition in the food processing value chain, supply and reduction of food prices to ensure affordability (Government of Kenya, 2020). It's 2023 and Not much has been achieved.

CHAPTER THREE:

RESEARCH METHODOLOGY

3.1. Introduction

The chapter describes how data were obtained, processed, analyzed and interpreted to answer the objectives of the study.

3.2. Study area

The study was done in Vihiga County. Vihiga County lies in Western Kenya, with The equator cutting across the southern part of the County (Integrated & County Plan, 2018). It covers an area of approximately 531 Km₂ with an annual rainfall of between 1800mm-2000mm and 24 degrees centigrade. The County has five sub-counties; Emuhaya, Sabatia, Luanda, Hamisi, and Vihiga. The population in Vihiga County is 590,013 as per the 2019 Census. it has a population density of 1,047/person/km². The male accounts for 48.1 % while the female 51.9%. The population is expected to grow to 604,777 persons by 2023 (County Government of Vihiga, 2019). The main economic stay of Vihiga County is subsistence agriculture which includes crop and livestock farming. The main food crops are maize, bananas, beans and horticultural crops. Other economic activities include trade and commerce.

3.3. Study design

This study adopted a cross-sectional design. Data were collected to find the existing agriculture and nutrition projects, the linkages of agriculture and nutrition on food security and factors influencing program implementation.

3.4. Study population

The target respondent were stakeholders in Vihiga County who support, implement and benefit from food security projects and policies. They are represented in the table below according to their level of influence.

Table 3. 1. Stakeholders grouping according to formal power

	KII respondents
Cluster 1 (policy influencers & program implementers)	County Director of Health Services, County Director of Agriculture, Director (ROP) Director (SOFDI) County nutritionist coordinator County Community Strategies, Focal person County Agricultural officers (Vihiga and Hamisi Sub-Counties)
	FGD Respondents
Cluster 2 (Beneficiaries of programs)	Community Health Volunteers Farmers

The heads of ministries and NGOs together with their subordinates were put in the top power cluster and they responded to the Key Informant Interviews while the consumers in the lower power cluster participated in the Focused Group Discussion Interviews.

3.4.1. Inclusion criteria

- i Selected stakeholders from health and agriculture ministries, NGOs and head officers were included in KII.
- ii Selected farmers from various farm groups and CHVs were included in the FGD.
- iii A selected sample size of farmers who practice livestock and crop farming from the Vihiga and Hamisi Sub-counties .

3.4.2 Exclusion Criteria

- i Stakeholders who did not give informed consent to participate were excluded from the study

3.5. Sample size determination

A formula by Fishers *et al* (2007) was used to determine the sample size as represented below-

3.6. Sampling design and strategies

The study purposively selected thirty (30) stakeholders. Out of the 30 stakeholders, 10 from cluster 1 were engaged in the key informant interview. Another group of ten farmers who were beneficiaries of projects were engaged in the first focused group discussion. The second focused group discussion consisted of 10 community health volunteers. The farmers and community health volunteers were classified in cluster 2. Additionally, three hundred and eighty-four (384) structured questionnaires were administered to farmers to gather quantitative data. This sample was obtained through proportionate sampling. Vihiga Sub County has 4 wards and Hamisi Sub County has 7 wards. As a result of the several wards in Vihiga and Hamisi sub-counties that were different in numbers. Then random sampling was used on each ward to obtain a representative sample.

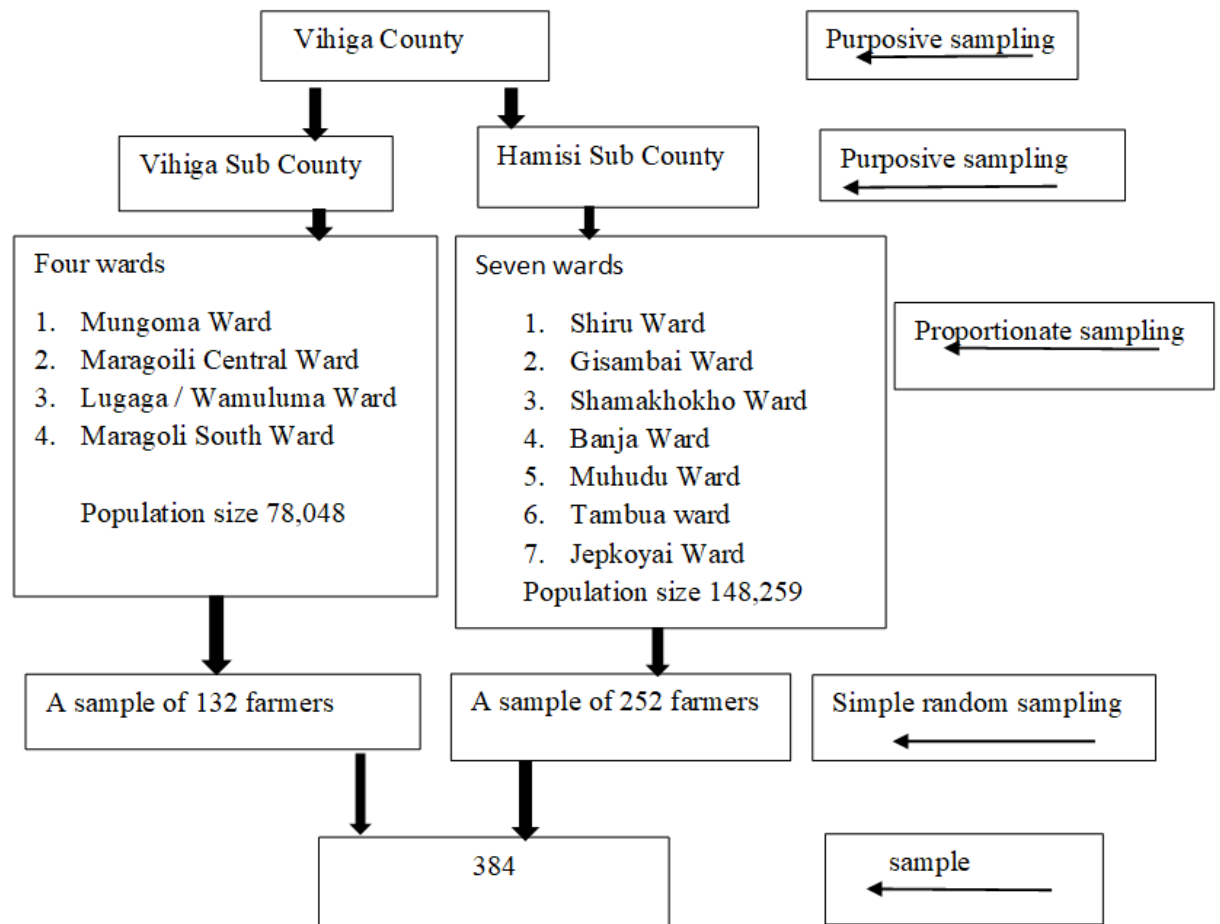
Table 3. 2. Illustration of sampling techniques for qualitative data

Stakeholders	Type	Number stakeholders interviewed	of Data collection tools
Public	Ministry of Health (MOH)	3	KII
	Ministry of Agriculture (MOA)	5	KII
Civil Society	Rural Outreach Program (ROP)	1	KII
Non-governmental Organization	SOFDI	1	KIII
	Totals KII	10	
Consumers/Users	Farmers	10	FGD

Community Health Volunteers CHVs	10	FGD
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The sampling of farmers to respond to the questionnaires was calculated based on the population size of Hamisi and Vihiga Sub County. The required sampling size was acquired as illustrated below

Figure 3.1. Illustration of sampling techniques for quantitative data



3.7. Data collection

3.7.1. KII and FGD

Key informant interview tools were used to interview the top-level stakeholders. The interviews were done face-to-face with the respective officers. Date and time were scheduled depending on the day availability of the stakeholders. The researchers targeted at least two interview sessions per day for twenty minutes each. Documentation of the KII sessions was done through notes taking.

Two sessions of FGD were conducted. One group was with farmers and the other group was with community health volunteers. The researchers had a target of 10 participants in each group and conducted the interviews on separate days. The researchers had a minimum of 90 minutes for each session. Each session had two research assistants, one taking notes and the other tape recording the proceedings as the researcher moderated the sessions.

A triangulation design procedure was used. The researcher was involved in concurrent, but separate, collection and analysis of quantitative and qualitative data.

3.7.1 Semi-structured questionnaire

Primary data on the socio-demographic and economic characteristics of the farmers (lower-level stakeholders) were collected using a semi-structured questionnaire used to gather data from the farmers who were supported by the specific stakeholders identified.

The questionnaire was structured into six (6) major sections as presented in the table below.

Table 3. 3. Questionnaire major section

Section	Key Variable	Details of the Variable
Section 1	Background Information	Personal Data
Section 2	Participation Status	Existing Agricultural Programs, Program Supporters, Benefit Nature, Farmers Groups, Extension Service Communication Channels, Training and Methods of Information Dissemination
Section 3	Food Availability	Land Size, Farming Land, Crops, Method of storage and preservation, Sufficient Food, Food Availability period, Sources of Food, Food Importation, Challenges, Food Shortage, Livestock and products
Section 4:	Food Access	Food Sufficiency, Frequency of food access, Food Choice, Hunger
Section 5.	Households Coping Strategies	Low food consumption, Low Food Portion Skipping Meals, Borrow Money, Borrow Food, collecting left offers/Wild Fruits, Selling Assets to buy food Job Search
Section 6.	Crop diversity	Cereals, Root and Tubers, Legumes, pulses and nuts, Vegetables, Fruits &Others

3.10. Pilot Study

The pilot study was done to dissect and ascertain the validity and reliability of the data assortment method. The researcher conducted pilot testing at Kakamega County targeting 38 respondents represented 10% of the sample.

Kakamega County was chosen because it has the same study environment characteristics as Vihiga County. One-tenth of the sample size is sufficient for pilot testing (Mugenda & Mugenda, 1999). This is in line with the argument of (Connely 2008) who asserts that the pilot study should have 10% of the sample projected for study.

In the case of the key Informant interview which target 10 respondents, only 5 pilot tests were done to ensure reliability. The pilot study was done to assist the researcher to know what challenges and issues were faced during the actual data collection process and to acquaint them with the settings of the actual field study. The pilot study was very crucial in determining if the items in the research instruments yielded the required data main study and adjusted according. The instruments were revised accordingly before the main study depending on the results of the pilot testing. Two of the selected research assistant aid in the qualitative data collection process while the rest take part in quantitative data collection

3.10 Validity and Reliability of data collection tools

3.10.1. Validity of the data collection tools

It was accomplished by the researcher by gathering a profundity of data about the stakeholder's influence on food security projects with the assistance of the supervisor to

ensure data collecting tools had questions that included all the elements of the subject and that the questions were able to cover the many aspects of the subject. The instruments were given to experts in the area of food public health nutrition, food science and project management for validation. In this study content validity measured the extent to which variables in the Likert scale measure what it was intended to measure as was the right framing of questions.

3.10.2. Reliability of data collection tools

Cronbach alpha was used to ensure the reliability of the tool. Using an inter-item correlation matrix as a guide, questions that did not strongly contribute to alpha, were removed. It was expressed between 0 & 1 (Tarvokal & Dennick, 2011) Cronbach alpha was written as a function of several test items and the average intercorrelation of the item.

Where N = Number of item

C = is the average

V = is equal to the average variance.

Using the above-mentioned formula, the Cronbach alpha increases with the increase of the number of items and therefore the reliability coefficient of 0.70 is deemed acceptable. (IDRE, 2015)

The 38 samples that were collected in the pilot study were entered into SPSS software and reliability analysis for Cronbach alpha was run to determine the reliability of the research instrument and returned results of $\alpha = 0.89$ for $N=38$ and Number of Items 46. Thus, the instrument was considered reliable.

3.11. Data Management, Analysis and presentation

Thematic content analysis was used to analyze the qualitative data. All transcripts and notes taken were scrutinized and results were validated by seeking alternative explanations from the participants to what appear to be research results. The researcher further looked at common themes and sub-themes that related to the study. These themes and sub-themes appeared as major findings from the qualitative data. Data from the questionnaires was analyzed (SPSS) version 20 and descriptive statistics were used for categorical variables.

Table 3. 4. Data Analysis and Presentation

Objective	Statistical Software used	Statistical methods	Data presentation	Data collection tools
1	Thematic content analysis SPSS	Quotation of expression verbatim Descriptive analysis – Frequencies and percentages	Common themes and sub-themes Tables, charts and graphs	KII/FGD questionnaires
2	Thematic content analysis	Quotation of expression verbatim	Common themes and sub-themes	KII/FGD
3	Thematic content analysis SPSS Version 20	Quotation of expression verbatim Descriptive analysis – Frequencies and percentages	Common themes and sub-themes Tables, charts and graphs	FGD Questionnaires'
4	Policy reviews	policy analysis	Themes	KII/FGD

3.12. Ethical Consideration

A research permit of Ref Number: NACOSTI/P/19/27395/31796 was obtained from (NACOSTI). Ethical clearance of Ref Number: MMUST/IERC/27/19 was granted by Masinde Muliro University Institutional Research and -ethics committee (MMUST-IREC). Permit to undertake the study was obtained from all the relevant administrative offices in Vihiga County. The principle of autonomy was exercised through the process of free and informed consent with all the stakeholders involved. They were free to withdraw from the study at any point and no compensation was guaranteed.

CHAPTER FOUR:

PRESENTATION OF THE FINDINGS

4.1. Introduction

The section presents the result of the study. Both the qualitative and quantitative findings were integrated into the report.

4.2. Response rate

The study targeted a sample size of 384 respondents out of which 273 (71%) managed to respond to the questionnaires as indicated in Table 4.1. This was considered adequate, some farmers were not found in their households and the remote nature of the areas; the researcher and the enumerators were not able to revisit the households in the selected wards. The targeted sample for the key informants was 10 but the researcher successfully interviewed 7 while all the targeted sample on focused group discussion participated.

Table 4. 1: Response Rate

Qualitative Data (KII & FGD)		
	Targeted sample	Actual sample
Key Informant Interview	10 Top Level Stakeholders	7
Farmers	10 Farmers (Lower-level stakeholders)	10
Community Health Volunteers	10 CHVs (lower-level stakeholder)	10
	30	27
Quantitative Data (Structured Questionnaires)		
	Targeted sample	Actual sample
Vihiga Sub County	132	120
Hamisi Sub County	252	153
	384	273

4.3. Socio-demographics characteristics

According to Table 4.2, the majority of the respondents 61.9% were female, while 38.1% were male. In the sample, 61.2% were aged between 36-45 years, 5.1% (46-55 years), and 33.7% (56 years and above). The vast majority of farmers 89.7% were married, while a small portion 9.2% were widowed. More than half of the respondents, 60.8% depended on farming as their main source of income. Regarding their education, 26.4% of respondents were educated up to the primary level, 27.1% up to the secondary level, and 24.9% up to the college level. 94.9% were christians, with only 5.1% being Muslims.

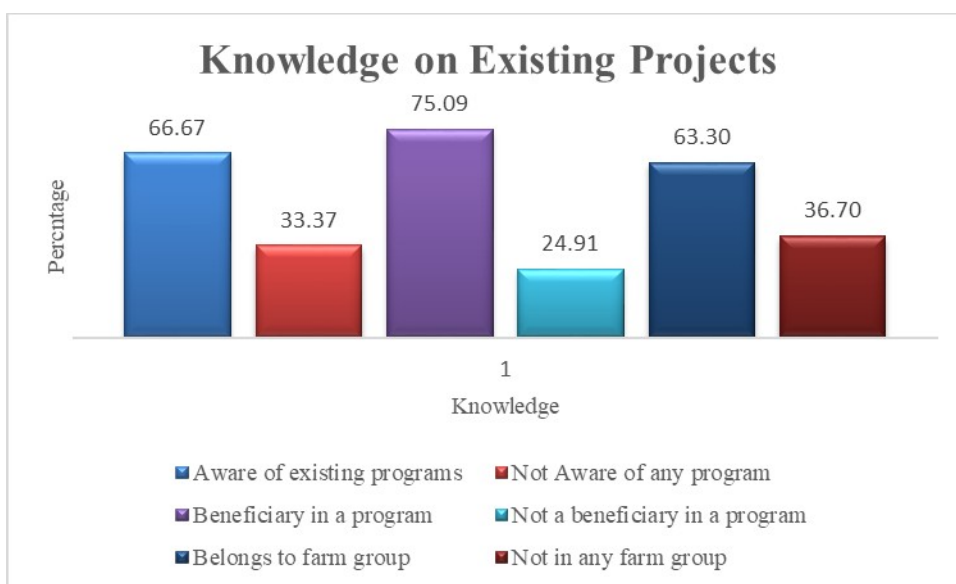
Table 4. 2: Socio-demographics characteristics of respondents

Demographics		n	%
Gender	Male	104	38.1
	Female	169	61.9
Age	36-45yrs	167	61.2
	46-55yrs	14	5.1
	56 and above	92	33.7
Education level	None	4	1.5
	Primary	72	26.4
	Secondary	74	27.1
	College	68	24.9
	Others	55	20.1
Marital status	Married	245	89.7
	Divorced	2	0.7
	Widowed	25	9.2
	Single	1	0.4
Occupation	Farmer	166	60.8
	Business	81	29.7
	Others	26	9.5
Religion	Christian	259	94.9
	Muslim	14	5.1

4.4. Agriculture/ nutrition projects and food security

Agriculture and nutrition projects are important components of efforts to improve food security, and they can contribute to broader efforts to promote sustainable development and reduce poverty. Several projects were mentioned but a few appeared to be more familiar to all stakeholders. Findings from the farmers showed that (66.67%) were aware of the existing agriculture programs in the county, (79.09%) were beneficiaries of these programs and 63.30% belong to farm groups. (NARIGP) and (ASDSP) were the most mentioned.

Figure 4.1. Knowledge of existing projects

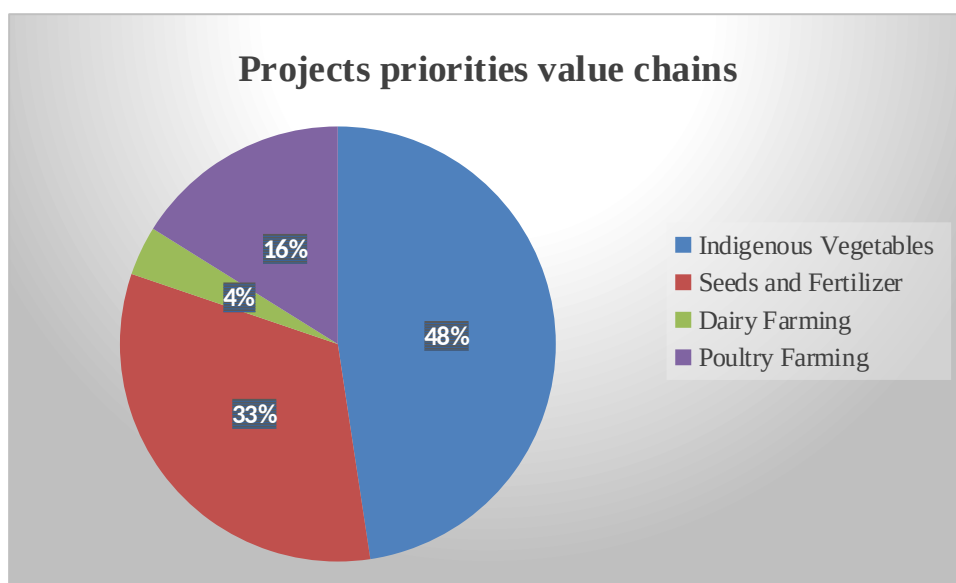


More findings from the qualitative survey, majority of the stakeholders reported that: *We have (NARIGP) which contains four value chains. Dairy, Local Chicken, Banana project, and Local vegetables and Agriculture Sector Development Support Programs (ASDSP). This project involves three major value chains which include Dairy, Poultry, and Banana Project (KII 1, 4, 6, 7).*

The point of priority in these programs as mentioned by stakeholders is Dairy farming, poultry farming, Banana farming and supply of seeds and fertilizers for other crops like

maize. About 48% of the farmers were involved in indigenous vegetable farming, 32% benefited from seeds and fertilizer, 16% supported poultry farming and the least number of them 4% practised dairy farming.

Figure 4.2. Projects Priorities value chains



4.4.1. Projects distribution

The program services are not equally distributed as the majority of the stakeholders reported that: *Most of our farmers and household in this community are still very poor and they never benefit from this program. It's a matter of first come, first served and the friendship a farmer has with the distributors of the services for the fertilizers and seeds are mostly chiefs than to sub-chiefs and then to Wazee wa mitaa (Area elder Men). There*

is usually a lot of corruption and even those who paid ksh.500 may end up missing the fertilizers and seeds (FGD, F₂, 9)

Another respondent reported further that: there is not enough supply and sometimes they delay the services past the appropriate time of planting the seeds and dressing the fertilizers. A farmer is to receive 2 kg seeds, 10kg fertilizer for planting and 10kg fertilizer for top dressing. If a farmer has bigger land, they have to go to their pocket to add on the seeds and fertilizers. For those who use them appropriately, there are usually better yields than the rest. (FGD, F₈)

Most of the programs target small-scale farmers but rarely do these services get to them while there exist delays by the top leaders who are given the responsibility to oversee the program distribution. A respondent noted that; the programs target small-scale farmers but that is not what necessarily happens at the grassroots level. This leads to most of our small-scale farmers lacking knowledge, skills and information. Those trained do not train other people and some people are paid to attend the workshops, seminars and conferences (FGD, F₆).

With the programs in place, the community are not fully given a chance to implement the programs but there is delay and poor coordination from top leadership. If the community could be allowed to implement programs by itself, this will help improve distribution and coverage because they know each other better (CHV₅)

There exist biases where some farmers are in more than one project while others never get the chance to be in any. *Few farmers are in different projects and others are not in any project. Some are aggressive to join groups and our offices are biased toward some people especially those who show interest and active participation when called upon* (FGD, F₃)

4.5. The linkage between agriculture and nutrition projects on food security

The study sought to know if the stakeholders understood the linkages between Agriculture and nutrition. A stakeholder from the Ministry of Agriculture shared: *We aim at production but nutrition value is less considered*” (KII₁)

However, there was a good connection between the importance of agriculture for the economy, particularly to reduce poverty and improve food security. While income was an essential component of agriculture-nutrition linkages, the link between income and nutrition was rarely made. *Ministry of Agriculture project that has the potential for positive nutrition outcomes are not done from a nutritional point of view. Production diversification and income is the goal. The push for value chains like indigenous vegetables is also more related to climate change concerns than to nutrition* (KII₅)

The several agriculture projects running in the county are mentioned by the stakeholders, but they are less linked to the problem of the people and what their demands are in terms of Nutrition. The main motivation of farmers in Vihiga County is usually income

generation. As a result, they tend to plant the most lucrative crops, rather than crops that will meet their nutritional needs. However, some stakeholders had different views. *There is a great linkage between Agriculture and Nutrition. During our clinics and meetings with clients, we encourage them to practice small-scale agriculture and subsistence farming to enable them to produce food, fruits and vegetables that will help diversify their nutrients and reduce malnutrition (KII₆)*

Some stakeholders connected how Nutrition and agriculture are related and interdependent. Nutrition-sensitive agriculture can improve nutrition in Vihiga County. To do this, farmers should plant their crops with nutrition in mind, and then consume what they need; they should only sell surplus. The link between nutrition and agriculture is better understood at a grass root level, such as among CHVs. One respondent noted: *There is a strong link between Agriculture and nutrition. Several People in the community have been given avocado seeds and dairy cows. We encourage them to take milk from the cows to feed their family. In my area, there is a cow in every household and communication is not easy but people are healthy. So, agriculture and nutrition are related. The responsibility of community health workers is to encourage them to drink milk and eat fruits instead of selling out all (FGD, CHV₁₀)*

The entirety of the work of the community health volunteers (CHVs) in connecting the community with the ministries of health and agriculture could be qualified as nutrition-sensitive. The (CHVs) and general agricultural extension officers under the health and

agriculture section help in sharing knowledge about agriculture and nutrition to promote food security. They mainly reach out to the farmers and other community and household members. However, the work of the CHVs is mostly overlooked and less supported to implement food and nutrition situations in Kenya. Funds are also insufficient for them to attend forums and other implementation activities at the grassroots levels.

4.6. Factors influencing the implementation of food security projects in.

4.6.1. Collaboration/partnership among stakeholders

Ministries stakeholders were primarily responsible for the support of agriculture and nutrition programs in Vihiga County. In responding to the question on collaboration among them, there appeared to be little to no interaction among the stakeholders and this is concerning because collaboration among stakeholders from previous studies has proven to increase programs outcome.

Sometimes when we have projects, we involve the Ministry of Health in the area of Agri-nutrition. The activities include Nutrition education, Energy conservation and value addition such as training of farmers. We could have farmers who produce food from agriculture but fail to utilize it for their consumption and so we link up with the Ministry of Health in the nutrition department to support training and education. We also involve the Ministry of Health during our meetings in strategizing how the programs are going to run”. (KII₇)

A stakeholder of the Ministry of Health shared that:

The Ministry of Agriculture runs projects but rarely do they involve the Ministry of Health, sometimes we attend the meetings at the beginning of the projects but we are not involved in afterwards progress like implementation or in the allocation of funds. There is a sector of Agri-nutrition in the Ministry of Agriculture but truly we do not work together to support any project on nutrition or agriculture. Every ministry runs on its own, we can never say there is a collaboration or any kind of partnership (KII₄).

Previous meetings have been arranged to deliberate on projects, but the final decision is made at the Ministry of Agriculture.

The Ministry of Health through the nutrition department was called for a meeting to discuss the implementation of one of the agriculture programs so that matters to do with nutrition in the project could be well represented but since that meeting, Nutrition has not been involved and the projects are operated by the ministry of agriculture (KII₆)

They do have occasional meetings when there is a project to discuss how funds will be used and who to engage in the project. Once the meetings are over, little is done to implement what was discussed. There is an opportunity here to work together if they put in place proper mechanisms and strategies to cooperate for example organize meetings that will bring together their different strength to help implement programs and policies.

4.6.2. Access to information, knowledge, and training

The researcher sought to understand if the farmers receive an agricultural extension and services from the County Government of Vihiga as an initiative to promote food security. 221 respondents (81%) reported that they receive agricultural extension services from the County Government of Vihiga and Non-governmental organizations targeting agriculture. Most of these agricultural extension service providers (59.7%) communicate by word of mouth to the farmers, 15.4 % use a radio or Television to pass information while a few (7%) communicate by word of mouth. The agricultural support programs in Vihiga County regularly hold agricultural-related trainings and out of the sampled study respondents, the majority 214 respondents (78.4%), do participate in these trainings while a few, 59 respondents (21.6%) do not. On training content, 108 respondents (39.6%) reported that they are trained on seeds and fertilizer, 65 respondents (23.8%) on methods of farming and 50 respondents on agriculture innovation and new farming technologies options respectively. In delivering the training several methods are used. From an analysis of farmer's responses on methods used by agricultural support programs, the researcher found out that 30.8% of the support programs adopt a farmer field school to deliver information, 30.4% train and visit and 17.6% use a participatory approach.

Table 4.3. Access to information, knowledge and training

Variables			n	%
Receive agriculture extension services	Yes		221	81
	No		52	19
Communication channels	Radio/TV		42	15.4

used by agriculture extension service providers	Mobile	7	2.6
	Posters	29	10.6
	By mouth	163	59.7
	Others	32	11.7
Participation in agricultural-related training	Yes	214	78.4
	No	59	21.6
Content of training	Farming methods	65	23.8
	Agriculture Technology	50	18.3
	Seeds and fertilizer	108	39.6
	options	50	18.3
	Others		
Methods Used in Training	Home visit	83	30.4
	Participatory method	48	17.6
	Field visit	84	30.8
	Item approach	1	0.4
	None	57	20.9

4.6.3. Land size and division

(35.5%) 97 respondents own less than 0.5 acres of land, 48 respondents (17.6%) own between 0.5-1.0 acres of land, and 59 respondents (21.6%) own more than 2 acres of land. Most of the respondents (41.4%) reported that they use half of the land for farming, 30.4% use a small portion and 18.3% use three-quarters of the land for farming.

Table 4.4. Land size and division

Variables		Frequencies	Percentage
Size of land	Less than 0.5 acre	97	35.5

	0.5-1.0 acre	48	25.3
	1.2 acre	69	21.6
	More than 2 Acres	59	17.6
	Totals	273	100
Total acreage used for farming	A small portion	83	30.4
	Half of the total land	113	41.4
	Three-quarter of land	50	18.3
	Others	27	9.9
	Totals	273	100

Findings from the majority of the stakeholders who participated in the focused group discussion pointed out that land issues have always been a challenge in Vihiga County. This has also been contributed to the increasing population of household members and thus the high rate of land divisions.

We have very small land and that has been a big challenge in our effort to practice agriculture. Half of the land is used for the house and home compound. The reminding part is here I plant maize and vegetables (FGD F₂).

I have 5 boys and own 2 acres of land. When I subdivide it among them, there is nothing left to do in agriculture (FGD F₆).

4.7. Programs Policies

The stakeholders previously listed are involved to varying degrees in the following activities: agriculture productivity, income growth, food security, growth monitoring, maternal health and school feeding programs. The majority of the stakeholders from cluster one (High power) were aware of the existence of the policies and supported the value chains (seeds, fertilizers, training etc.).

We Support value chains like the supply of seeds, fertilizers, agriculture training, distribution of dairy goats and cows, poultry farming, bananas and indigenous vegetables. These aid in support of agriculture productivity, income growth for our people and improves food security at large (Stakeholder report MOA,)

About nutrition programs and policies focusing on maternal health, and growth monitoring, there is a positive response to implementation as reported by a stakeholder.

‘We have iron and folic acid supplementation which is a supplement program given to pregnant women free during their antenatal clinics. We also have vitamin A supplementation given to women after delivery and children above 6 months up to 5 years during the mother and child health clinics, there are Growth Monitoring Programs covering children under five years. (Stakeholders report, MOH)

School feeding programs have a minimum coverage and are biased targeting only one school in the whole county. It is supported by the Ministry of Health and SOFDI.

We have a school feeding program which supports one ECD school in Sabatia but does not cover any other area in Vihiga County the Ministry of Health partners with SOFDI to support this program. (Stakeholders report, MOH).

Some of the stakeholders work together to support programs. The Ministry of Health and SOFDI work together to support the school feeding program. Stakeholders from the Ministry of Health and the CHVs who work under the Ministry of Health show equal efforts in support of both nutrition and agriculture programs. This clearly shows their understanding of how the programs could work together to promote food security.

CHAPTER FIVE

DISCUSSION OF THE RESULTS

5.1 Introduction

The chapter discusses the finding of the study as per the objective regarding Agriculture and Nutrition programs and how stakeholders influence the support of these programs in Vihiga County to promote food security.

5.2. Stakeholders and food security projects

Agriculture and nutrition projects can play a critical role in improving food security in many communities, especially in developing countries like Kenya. Agriculture projects that focus on increasing food production and improving the quality and diversity of crops can help to improve food security. These projects may include initiatives such as promoting sustainable farming practices, providing farmers with access to improved seeds and fertilizers, and supporting the development of local markets for agricultural products. Furthermore, nutrition projects also aim to improve access to nutritious foods and educate communities about healthy eating habits can also contribute to food security in the county.

On stakeholders and the existing projects in Vihiga County. The major stakeholders identified in this study were: The Directors of Agriculture, Health, Rural outreach program (ROP) and SOFDI, County Nutritionist, Sub -counties agricultural officers. Studies have shown that stakeholders' support of agriculture and nutrition has tremendously enhanced agricultural productivity while helping improve food security in the country (Tounkara et al., 2019)

Several projects were mentioned but a few appeared to be more familiar with all stakeholders. They included; (NARIGP) and (ASDSP). The findings about these projects were similar to the report from (KCCR, Vihiga County, 2020). The program focused on four value chains: (AIVs), indigenous chickens, dairy, and bananas. This is contrary to other projects from agriculture institutions (KALRO) with more intervention including research and extension, capacity building and the provision of Agri-inputs such as seeds, chicks, fertilizers, and pesticides (Integrated & Plan, 2018). Other stakeholders found supporting agriculture projects were: One-acre fund and welt hungerhilfe. One of the major challenges cutting across was inadequate human resources and poor coordination among them which led to overlap and duplication of roles and efforts (KCCR, Vihiga County, 2020). This study's finding shows a similar challenge of program duplication and unequal distribution. It further shows other existing challenges as quoted below Majority of the respondents: reported that there are not enough human resources and retired have

not been replaced. Biasness in terms of being part of a project was also reported as a big issue.

Anderson in his study stated that the majority of the developing countries that practice small-scale farming are topographically dispersed hence the coverage and distribution of programs become difficult to reach farmers, (McDermott et al., 2015). This finding is similar to the finding of this study which found that there was a challenge in program distribution and coverage. Some farmers were found to be in more than one program, and this lack of equal distribution and coverage of programs causes some of the members of the community to miss services that could help improve their productivity. There was a lot of favouritism to some while others were left out. This is confirmed by their responses during the interviews

The program services are not equally distributed. Most of our farmers and household in this community are still poor and never benefit from these programs. It's a matter of first come, first served, and the friendship a farmer has with the distributors of the services for the fertilizers and seeds are mostly chiefs than to sub-chiefs and then to 'Wazee wa mitaa' (Area elder Men). There is usually a lot of corruption and even those who paid ksh.500 may end up missing the fertilizers and seeds as reported by a farmer (*FGD F₈*). There are however fewer former findings about program distribution and coverage and this study concludes there is indeed this challenge in Vihiga County, especially in programs dealing with agriculture.

5.3. Linkages between agriculture and nutrition

The linkages between agriculture and nutrition are complex and multifaceted. To ensure that agriculture contributes to improved nutrition, it is essential to consider these linkages and take a holistic approach to food production, processing, and distribution. The linkages can be viewed from several angles: crop diversity, animal husbandry, food processing, food distribution and environmental factors such as soil and water.

A study by Griffith & Watson, 2016, “Nutrition and agriculture linkages” explains the connection that show the equal reliability on nutrition, health and agriculture. Literature has reported changes in agriculture can have effects on health and nutritional status. Interventions in the area of agriculture meant to improve nutrition have also been named ‘nutrition-focused agriculture’ (Alpha & Gebreselassié, 2015).

In a study by Hodge et al., 2015b, Nutrient consumption from food is directly affected by the types and quantities of foods household produce, mostly in the case of subsistence agriculture. Ruel further state that increased income from the sale of agricultural produce and high farm productivity only contributes to improved nutrition if the income is directed into adequately purchasing nutritious foods. Findings from this study are similar to the former findings where the majority of the respondent supported that proper agriculture practice on nutritious food production and consumption improves the nutrition of the community. However, few responses showed that agriculture focuses on increasing

production for income. However, there was a good connection between the benefits of agriculture to the economy, particularly to reduce poverty and improve food security.

The agriculture sector focus more on creating income and jobs for the people. This therefore means that agriculture project might increase local income, but it also impacts the local food environment. Agriculture projects that do not consider nutrition, could be undermining the health of the community. In a former study by Bhagowalia et al., 2012, agriculture-practising households are expected to know the linkage between agriculture and nutrition to promote food security. Agricultural activity determines the distribution of income and affects the food available for consumption by the household.

It's expected that when programs/policies increase a farmer's income, they will use their increased purchasing power on food that improves their nutrition. That said, it is unlikely that they will buy foods for a healthy and diverse diet unless they are educated on nutrition and have a complementary food environment. This is similar to the findings of this study where a few respondents from the Ministry of Health encourage clients during clinics to practice small scale agriculture like having a kitchen garden that will help diversify their diet and increase nutrients intake. The study concludes that agriculture influences nutrition and health. Policies that promote investment by different sectors in agriculture could have a direct impact towards the improvement of nutritional status.

5.4. Factors influencing programs implementation

The implementation of food security programs requires a holistic approach that considers the many factors that can impact their success. By addressing these factors, food security programs can help to ensure that everyone has access to the nutritious food they need to thrive. The researcher found several factors influencing the implementation of food security programs in Vihiga County.

5.4.1. Collaboration/ partnership

Stakeholders' collaborations are the coming together of different stakeholders to build synergy by identifying common goals, promoting interaction, learning towards joint action and creating new programs and services to promote food security. There appeared to be little to no interaction among the stakeholders and this to some extent influenced program implementation in Vihiga County. This is concerning because collaboration among stakeholders from the previous study has proven to increase programs outcome. In this study, stakeholders reported there usually attempts to collaborate but it dies at a certain level especially when there are funds involved in projects. The above findings are supported by a study by Ville, that collaboration among stakeholders is a challenge and there is a lack of coordination mechanisms to ensure multi-sectoral collaboration and implementation of programs and many of the stakeholders want to run their programs (Saint Ville et al., 2017b). However, the majority of the stakeholders agreed that collaboration among them can cause significant improvement to the programs.

The lack of mechanisms and strategies to facilitate collaboration is a big issue. Hodge stated that collaboration among stakeholders plays a big role in supporting projects in a wide range rather than operating at individual bases (Hodge et al., 2015b). Financial and human resources are weak and not sufficient to facilitate proper collaboration among stakeholders (Hawkes & Ruel, 2011). Mockshell and Birner, state that improving the quality of collaboration and interaction among stakeholders has the potential to better implementation of programs (McDermott et al., 2015; Mockshell & Birner, 2015).

Studies further show stakeholders can work together and build synergy by identifying a common goal, promoting interaction, learning towards joint action, and creating new agriculture and nutrition programs and services to promote food security. Whatever the results, collaboration can help a range of stakeholders in understanding the challenges that hinder project implementation (Gelli et al., 2015; Saint Ville et al., 2017a). This research concludes that Collaborative may succeed when stakeholders allow room for negotiation. They need one another to achieve goals. The collaboration will be effective when the likely results of the opposite are poor utilization of available resources to support programs, ignorance of agriculture and nutrition linkages, or worsened relations among stakeholders.

5.5. Education and training

Education and training programs can help improve food security by providing individuals and communities with the skills, knowledge, and resources they need to produce and

access healthy, nutritious food. By investing in education and training programs, food security projects can be more effective, sustainable, and responsive to the needs of the communities they serve. Chung et al., 2012, observed that education, training and interpersonal connectivity between farmers and stakeholders will enhance farmers' information literacy, knowledge and awareness of current trends in farming, and the existence of various agricultural and nutrition programs. Mbwana et al., 2017 stated that knowledge and skills given to farmers and other stakeholders about agriculture and nutrition programs, and farming methods among others will likely improve agriculture production as well as nutrient intake. The above finding is also supported in another study by Sawicka & Hameed, 2015 that training and proper education impact productivity.

Findings from this study show that most farmers have been educated and trained in different ways to improve agriculture. 78% of the farmers who participated in this study had undergone training on agriculture innovation, new farming technologies, methods of farming, seeds and fertilizer options. Amao & Amaeshi, 2008a said that education level influence income

The farmer who is educated is likely to be rich. This is confirmed in another study that People get skills from education which helps them in problem-solving, (Hodge et al., 2015b). Sokoya et al., 2014 further say that education, helps one acquire information through reading or listening. Hameed & Sawicka, 2016 said that training and proper education of farmers through farmer field schools, visiting farmers' households and using

a participatory approach will promote high agriculture production. In this study, 30% of the farmers reported that the method used to train them was training and home visits by some of the extension service officers. 17% used a participatory approach to train them.

The researcher sought to understand farmers' knowledge of information related to agriculture assuming that if a farmer is well informed about farming methods, types of seeds and fertilizers to use and fully participate in any activities related to farming, there will be increased production and food security will improve. One of the best ways farmers benefited from the existing programs was to belong to a farmer's group. According to the findings, the majority (76%) of the consumer stakeholders belong to a farmer group. Former researchers do not bring up the idea of farmers being in groups to access services but focused more on extension services.

According to Sokoya et al., 2014 agricultural extension is the dissemination of agricultural-related information to farmers in the community. The officer in charge is always rich with information to give to the farmer. This form does not have a two-way flow of information and the officers do not separate information according to the agro system. (Lawrence & Omuse, 2021). It slows down the farmers' potential towards improvement in the agricultural sector (Gelli et al., 2015). According to (Nyakoyo & Odhiambo, 2020), stakeholders have developed an interest in improving the extension services for farmers to have more available access to agricultural information.

In the current study, 221 respondents (81%) reported that they receive agricultural extension services from the County Government of Vihiga and Non-governmental organizations targeting agriculture. Most of these agricultural extension service providers (59.7%) communicate by word of mouth to the farmers, and 15.4 % use a radio or Television to pass information however some of the farmers reported that one has to look for the officer by themselves or book an appointment which many times fail. This can be associated with the lack of follow-up and proper supervision. It is obvious that when all the support is given, agriculture productivity will improve and none or less of this will prove verse versa.

5.7. Agriculture and nutrition policies

Agriculture and nutrition policies play a critical role in ensuring food security and improving the nutritional status of populations. By promoting sustainable agriculture, improving food safety and nutrition, and supporting vulnerable populations, these policies can help create a more equitable and healthy food system.

The majority of the stakeholders from cluster one (High power) were aware of the existence of the policies and supported the value chains (seeds, fertilizers, training, etc.). *'We Support value chains like the supply of seeds, fertilizers, agriculture training, distribution of dairy goats and cows, poultry farming, bananas, and indigenous vegetables. These aid in support of agriculture productivity, and income growth for our people and improves food security at large (KII Inter; 1, 2) Table 4.3.* these findings are

similar to Agricultural policy in Kenya focusing on increasing productivity and income growth. Majorly focuses on the enhancement of food security and equity, irrigation, commercialization, and environmental stability especially for smallholders (Monke et al., 2019). However, in terms of policy formulation most stakeholders at the grassroots level were left out.

Concerning nutrition programs and policies focusing on maternal health, and growth monitoring, there is a positive response to implementation as reported by a stakeholder. School feeding programs have minimum coverage and biased targeting only one school in the whole county.

Studies have found that the food security crisis is mostly connected to both policy failure and structural rigidities (GoK, Ministry of Finance, 2012). Although various stakeholders are involved in the fight for the support of food security in Kenya, policy implementation remains a challenge in the fight against food security issues.

The priorities of agriculture and nutrition programs are misaligned, even though they should be complementary. Although there have been several institutions involved in agricultural financing over time, actual investment and improvement in agriculture have been insignificant (Alpha & Gebreselassié, 2015). Policies have been established aiming at achieving food security, more recently Vision 2030. The vision aims that by 2030, we will have a competitive world with a prosperous nation enjoying a high quality of life.

Agriculture is targeted as the main economic pillar towards the realization of this vision. (Mohamed, 2018).

The Government do not take seriously the implementation of policies. For example, the Maputo Declaration at Mozambique in 2003 stated that all African states raise the budget allocation in agriculture to at least 10 % of the national budget by 2008 (African Union, 2003). The country has never lived up to this declaration and currently, budget allocation in agriculture is at 2.4% of the national budget which is still a quarter way to the international commitment of 10%. In the 2022/2023 budget, the government has allocated 378.4 million USD to the sector, a decrease from 564.9 million USD in the 2021-2022 period. (Deloitte, 2022)

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.1. Summary

Agriculture and Nutrition Programs, particularly regarding the linkages between agriculture and nutrition programs and how they can influence food security, proper distribution and coverage of programs to promote equal and fair support, collaboration among the stakeholders to work together for better outcomes of programs and possible future research.

6.2. Conclusion

Project implementation has been a major challenge and, in this study, it was attributed to various factors including, unequal project distribution, and lack of collaboration among stakeholders. Results of the research show that collaboration factors were due to a lack of synergy to strengthen the already existing efforts of collaboration and a lack of fairness when engaging farmers in projects. There was a requirement for stakeholders to collaborate more to fill the missing gaps. This would promote success in project implementation.

The land was found to be a major resource for agricultural productivity. Most farmers had a small portion of land for agricultural use. The majority lacked ownership and did not have title deeds. This hindered them from the desire to expand production. Further, there

was an increasing household population leading to a high division of land. The study further concluded that nutrition and agriculture are deeply connected and complementary in the fight against food security.

There was a challenge in pointing out the linkage between nutrition and agriculture to promote food security. In Vihiga County, individuals find it difficult to access and afford food items that meet their household's nutritional needs. When they do grow their food, the priority is income generation, rather than household consumption. Agriculture is essential to nutrition, but often that connection is overlooked. There does not need to be a false dichotomy between maximizing profit and maximizing nutritional value. Both the quantity of food produced, as well as the quality of nutrients produced, are essential in the fight against food insecurity.

Although policymakers see the value in agri-nutrition linkages, the existing government structures hinder close collaboration between those working in agriculture and nutrition. There appears to be a false split, where agricultural programs either grow profitable crops or nutritious crops. It does not need to be this way. Farmers and community members should be supported to produce more from their small plots through training on intensive agriculture technology, and expand and access marketing nutrient-rich foods obtained through agricultural produce.

6.3. Recommendations

6.3.1. Improve farm production

The Ministry of Agriculture should support farmers to produce more from their small plots through training in intensive agriculture technology. Moreover, farmers should be educated on how to practice farming more nutritious food options. The importation of food crops is more expensive for the country and down in Vihiga County which relays on other regions like Nandi for food.

Food security can be improved by increasing production. This will require several measures like; revamping and improving extension services in the County. Additionally, the study recommends more focus on agricultural and nutrition-related research. There should be the use of technology to increase yields in small land.

6.3.2. Involve Public participation in policy formulation.

The county government of Vihiga should strengthen public participation in the community when formulating and implementing policy action plans. This could work through existing structures such as the local NGOs, CHVs, ward agriculture officers, farmers, etc. The Ministry of Health should Support community health volunteers through training and allowances to motivate them to educate the community on nutrition-sensitive agriculture.

6.3.3: Work towards equal program distribution and coverage.

The government of Vihiga County through the ministries should work together with the NGOs, farmers as well as the CHVs towards harmonizing distribution and coverage of nutrition and agriculture programs to create a collaborative environment among them during implementation. This would work through creating a structure on how farmers' selection in the different wards would be done as well as the participation of the CHVs from the wards. The farmers and the CHVs are the keys stakeholders to support the achievements of agriculture and nutrition programs within the community

6.3.4: Awareness meeting

The MOH and MOA should organize meetings with the farmers and CHVs twice or thrice a year to create awareness of nutrition-sensitive agriculture and to encourage the use of agricultural produce to improve food and nutrition intake.\

6.3.5. Focus on collaboration

The stakeholders should develop strategies and mechanisms to collaborate on specific projects related to agriculture and nutrition for example through strengthening of existing positive relationships (previous meetings) and the improvement of confrontational ones. They could select active representatives from both sides to always advocate for

collaboration and act as a linkage and communication channel within and outside of their ministries.

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APPENDIX I: RESPONDENTS' CONSENT

Consent form

I..... consent/don't consent to participation in the study
being conducted by Elizabeth Sisiano Kilelo, a post-graduate student pursuing a master's
degree in the Department of Nutritional Sciences, at MMUST. She has informed me that
this is a study for her Master's degree designed to gather information about my influence
as a stakeholder in promoting food security in Vihiga County

Signature_____ Witness_____

Contact Numbers of Researcher: **Elizabeth Sisiano Kilelo** **Phone No: 0706949001**

APPENDIX II: KEY INFORMANT GUIDES

KEY INFORMANT GUIDES FOR INDIVIDUAL STAKEHOLDERS (those who direct, coordinate and organize programs)

My name is Elizabeth Sisiano. I am a student from Masinde Muliro University of Science and Technology. Am currently working on a project under the umbrella of Bioversity International to assess stakeholders' influence on food and Nutrition Security in Vihiga County. You have been identified as one of the stakeholders to participate in this key informant interview. The researcher assures you that any information provided for the research will be confidential. Your participation and cooperation during this vital endeavour are highly appreciated. One of the researchers will be the Moderator and the colleague will be taking notes. Any notes, videos or records that will be taken here will be kept confidential and used only for this study. We will take a Maximum of 1 hour Will you wish to participate? Yes: Proceed

Stakeholders from (MOA)	I. What is your general opinion about agriculture, Nutrition and food security in this county? II. Do the county work with other stakeholders both at the government and non-governmental level to support agriculture? III. What are the agricultural programs and policies currently operating in the county? IV. What can you say about program coverage in Vihiga County? V. Do we have policies in Vihiga County to govern agricultural activities? VI. How is the flow of leadership in agricultural programs? VII. What are the challenges you encounter while implementing the programs? VIII. What recommendations can you give to support the proper implementation of the programs?
Stakeholders from (MOH)	I. Do you currently run any nutrition programs? II. What are the specific programs? III. Do you feel that the programs have had an impact on the community? IV. How do the community Health Volunteers help out in the implementation of these programs? V. What can you say about the linkage of nutrition programs to agriculture? VI. Which of these programs depends directly or indirectly on agriculture?

	VII. What are some of the nutrition program policies VIII. How do they operate? Focusing on Maternal health, growth monitoring and school feeding programs IX. Do you think agriculture is a solution to improve nutrition? X. Do you collaborate with the Ministry of Agriculture e.g. such as the agri-nutrition department? XI. Are you closely involved in the several agricultural programs running currently to add nutrition ideas? XII. Do you do monitoring and evaluation of the nutrition programs? XIII. What are the challenges encountered while implementing the programs in the county? XIV. What are your recommendations concerning nutrition programs in Vihiga County?
Stakeholders from (NGO)	I. Do you currently run any agricultural projects? II. What is the project all about? III. What are the main objectives of the project? IV. Which areas in Vihiga County do the project target? V. Is the project linked to or supports nutrition at any point? VI. Is the Ministry of Health involved in this program (Nutrition Department) VII. What benefit does the project have to the farmers? VIII. What are the challenges of implementing the project?
Stakeholders from civil society	I. Do you have any agricultural projects in this sub-county? II. What are the objectives of the project? III. Is there a link of the project with others from the Agriculture County offices? IV. Do you have specific farmers that you are working with to implement the projects? V. How do you select farmers to work with? VI. How does this project support farmers in this sub-county? VII. What are the implementation challenges encountered? VIII. What is your recommendation concerning agriculture in this sub-county?
THANK YOU FOR YOUR RESPONSE	

APPENDIX III: FOCUSED GROUP DISCUSSION GUIDE (CHVs)

Introduction letter

My name is Elizabeth Sisiano. I am a student from Masinde Muliro University of Science and Technology. Am currently working on a project under the umbrella of Bioversity International to assess stakeholders' influence on food and Nutrition Security in Vihiga County. You have been identified as one of the stakeholders to participate in this focused group discussion. The researcher assures you that any information provided for the research will be confidential. Your participation and cooperation during this vital endeavour are highly appreciated. One of the researchers will be the Moderator and the colleague will be taking notes. Any notes, videos or records that will be taken here will be kept confidential and used only for this study. We will take a Maximum of 1 hour Will you wish to participate? Yes: Proceed

1. How familiar are you with **programs** that support Nutrition in Vihiga County? Mention them
2. How is the **participation** of your community in the programs? Probe for more in each program
3. Are the services of the program well **distributed** to the people in your community?
4. A). Do you think households in your area have problems with **food security and nutrition status**? Probe
 - b). How do you think this is a problem and how does it manifest? Probe for more
 - c). what role do the nutrition programs play or you feel can do to improve food security and nutrition status?
 - d). What can you do as a CHV/CHV to improve the situation?
5. What are some of the program **policies** that you know about?
6. Can you identify any implementation efforts in policies like **school feeding programs, Growth monitoring and maternal health**? Probe more.
7. Through agriculture, what foods do you think can be produced to support food diversity?
8. Apart from linking the community to the health facilities, do you do any other service about their a) hygiene b) feeding practices c) food diversity d) access to health care
Probe for more in each pillar
9. What are the **challenges** you encounter while supporting your community in Nutrition and health?
10. What can you recommend concerning Nutrition program **distribution, coverage and implementation**?

11. What can you recommend to help **strengthen** the linkage between agriculture and nutrition?

Thank you

APPENDIX VI: FOCUSED GROUP DISCUSSION GUIDE (FARMERS)

Introduction letter

My name is Elizabeth Sisiano. I am a student from Masinde Muliro University of Science and Technology. Am currently working on a project under the umbrella of Bioversity International to assess stakeholders' influence on food and Nutrition Security in Vihiga County. You have been identified as one of the stakeholders to participate in this key informant interview. The researcher assures you that any information provided for the research will be confidential. Your participation and cooperation during this vital endeavour are highly appreciated. One of the researchers will be the Moderator and the colleague will be taking notes. Any notes, videos or records that will be taken here will be kept confidential and used only for this study. We will take a Maximum of 1 hour Will you wish to participate? Yes: Proceed

1. How familiar are you with **programs** that support agriculture? Mention them
2. How is the **participation** of your community in the programs?
3. Are the program's services well **distributed** in your community?
4. Do you think households in your area have problems with **food security**? Probe
5. How do you think this is a problem and how does it manifest? Probe for more
6. How do people cope in such situations?
7. What are the contributing factors
8. Do you think that food is **accessible**, **available** and **affordable** in your community? Probe for more
9. How are the following **policies** being implemented?
10. Do farmers in your community practice **diversified** farming (explain in case not clear and probe for more.

11. Do you think there is a linkage between agriculture and nutrition? Probe
12. What are the **challenges** you encounter in the practice of agriculture?
13. What can you recommend concerning agriculture program **distribution, coverage and implementation?**

THANK YOU

APPENDIX V: QUESTIONNAIRE

Research questionnaire to be filled by selected farmers and household members in Vihiga County (Hamisi and Vihiga Sub County)

Introductory letter

I am Elizabeth Sisiano studying for a Master's degree at Masinde Muliro University. I am here to undertake a study on Stakeholders' Influence on Food and Nutrition Security in Vihiga County. I hereby invite you to kindly assist with this research by agreeing to be involved as a respondent to assess what effects the stakeholders' support in agriculture and Nutrition has caused on Food and Nutrition Security in Vihiga County. The researcher assures you that any information provided for the research will be confidential and none of the respondents will be asked to give their name. Your participation and cooperation during this vital endeavour are highly appreciated. If you will wish to participate in the research please acknowledge below.

Thank you

SIGNATURE DATE.....

QUESTIONNAIRE No: ____/____/____ (To be filled by data analyst)

No	Question and Filter	Coding categories
Section 1. Background information		
Q1	Record the sex of respondent	1=Male 2=Female
Q2	Age of the respondent	1. 18-35 years 2. 36-45 years 3. 46-55years 4. 56 years and above
Q3	What is your marital status?	1. Married 2. Divorced 3. Widowed 4. Single 5. Others
Q4	Education level	1. None 2. Primary incomplete 3. Primary complete 4. Vocational (secondary) 5. Secondary incomplete 6. College (certificate or diploma) 7. University 8. Others
Q5	Occupation	1. Farmer 2. Housewife 3. Formal employment 4. Casual worker 5. Business 6. Others specify _____
Q6	Religion	1 Christian 2. Muslim 3. Traditional 4. Others
Section 2. Participation status		
Q7	Do you know of any existing agricultural programs?	1. Yes 2. No

Q8	If yes, who supports the program?	Specify
Q9	Are you a beneficiary of any of the programs?	1. Yes 2. No
Q10	If yes, what benefits do you get from the program?	1. Training 2. Fertilizer 3. Seeds 4. None 5. Others specify.....
Q11	Do you currently belong to a farmers' group?	1. Yes 2. No
Q12	Do you receive any agricultural extension services?	1. Yes 2. No
Q13	What are the channels of communication used by the extension service providers?	1. Radio 2. Tv 3. Mobile text message 4. Posters 5. Word of mouth 6. Others specify
Q14	Have you participated in any agricultural-related training?	1. Yes 2. No
Q15	If yes, what was the training about?	1. Methods of farming 2. Agriculture innovations 3. Seeds and fertilizers options 4. Others, specify_____
Q16	Have you ever received any agricultural information?	1. Yes 2. No
Q17	What method is used in the dissemination of agricultural information?	1. Train and visit 2. Participatory approach 3. Farmer field school 4. Commodity approach
Section 3: food availability (crops and livestock production)		
Q18	What is the size of the land?	1. ___ acres (owned) 2. ___ acres (rented) 3. ___ acres (others) 4. None
Q19	What total land acreage is used for farming? _	_____ Acres
Q20	What crop did you grow in the last 1 year	Food crops _____

		_____ Cash crops _____ _____
Q21	Did you store any food after harvest last year?	1. yes 2. No
Q24	Do you always have food for all the members of your household?	1. Yes 2. No
Q25	How long do the harvested food last?	_____ Months
Q26	What are the sources of food in your household (can select more than 1	1. Food relief 2. Supplies from relatives/friends 3. Own farm production 4. Buying 5. Others specify _____
Q27	Of the ones mentioned above, which one do you regard as the most important? _____	_____
Q28	Do you have a kitchen garden?	1. Yes 2. No
Q29	. If yes, what are the main types of crops grown?	List them _____ _____
Q30	Is there importation of food from other regions	1. Yes 2. No
Q31	What do you think is the most challenging thing in practising agriculture in the county?	1. Low rainfall 2. Reduced land 3. Excess rainfall 4. poor technology 5. Others specify.
Q32	What do you think are the major reasons for food shortage?	1. Decline in own farm food production 2. Lack of funds to purchase food 3. Increases in food prices 4. Others specify
Q33	Do you own livestock?	1. Yes 2. No
Q34	If yes, tick the types (You can select more than one)	1. Cattle 2. Goats 3. Chicken 4. Rabbit

		5. Sheep 6. Fish 7. Beekeeping 8. Others specify_____
Q35	What products do you obtain often from the livestock?	1. Milk 2. Meat 3. Eggs 4. Honey 5. Others specify _____
Q36	What are the challenges you have encountered while keeping livestock? _____	1. Lack of food 2. Diseases and death of livestock 3. Time consuming 4. Difficulties in doing crop and livestock farming 5. Others specify
Section 5. households coping strategies Fill one choice		
Q46A	We consume less preferred foods	
Q26B	We limit the size of food consumed	
Q46C	We skip meals within a day	
Q46D	We borrow money to buy food	
Q46E	We borrow food from the neighbour	
Q46F	We collect leftover foods from gardens/ wild	
Q46G	We sell assets to buy foods	
Q46H	Most household members travel to search for jobs	
Section 6. Crop diversity Observe what is there in the land and ask the farmer what crops they plant under the following groups		
	Cereals	List them -----
	Roots and tubers	
	Legumes, pulses and nuts	
	Vegetables	

	Fruits	
	Others	

APPENDIX IV: ETHICS REVIEW COMMITTEE APPROVAL



MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY

Tel: 056-31375

Fax: 056-30153

E-mail: ierc@mmust.ac.ke

Website: www.mmust.ac.ke

P. O. Box 190-50100

Kakamega, Kenya

Institutional Ethics Review Committee (IERC)

Ref: MMU/COR: 403012 vol2 (14)

Date: 17th May, 2019

Elizabeth Sisiano

Masinde Muliro University of Science and Technology

P.O. Box 190-50100

KAKAMEGA

Dear Ms. Sisiano

RE: Stakeholders influence on food security in Vihiga county Kenya -MMUST/IERC/27/19

Thank you for submitting your proposal entitled as above for initial review. This is to inform you, that the committee conducted the initial review and approved (with no further changes) the above Referenced application for one year.

This approval is valid from **17th May, 2019 through to 17th May, 2020**. Please note that authorization to conduct this study will automatically expire on **17th May, 2020**. If you plan to continue with data collection or analysis beyond this date please submit an application for continuing approval to the MMUST IERC by **17th April, 2020**.

Approval for continuation of the study will be subject to submission and review of an annual report that must reach the MMUST IERC secretariat by **17th April, 2020**. You are required to submit any amendments to this protocol and any other information pertinent to human participation in this study to MMUST IERC prior to implementation.

Please note that any unanticipated problems or adverse effects/events resulting from the conduct of this study must be reported to MMUST IERC. Also note that you are required to seek for research permit from **NACOSTI** prior to the initiation of the study.

Yours faithfully,

Dr. Gordon Nguka (PhD)

Chairman, Institutional Ethics Review Committee

- Copy to:
- The Secretary, National Bio-Ethics Committee
 - Vice Chancellor
 - DVC (PR&I)
 - DVC (A & F)

APPENDIX IIV: NACOSTI APPROVAL



NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

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When replying please quote

NACOSTI, Upper Kabete
Off Waiyaki Way
P.O. Box 30623-00100
NAIROBI-KENYA

Ref. No. **NACOSTI/P/19/27395/31796**

Date: **10th September, 2019**

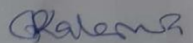
Elizabeth Sisiano Kilelo
Masinde Muliro University of Science
And Technology
P.O. Box 190-50100
KAKAMEGA.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on “*Stakeholders influence on food security in Vihiga County, Kenya.*” I am pleased to inform you that you have been authorized to undertake research in **Vihiga County** for the period ending **10th September, 2020.**

You are advised to report to **the County Commissioner, and the County Director of Education, Vihiga County** before embarking on the research project.

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit **a copy** of the final research report to the Commission within **one year** of completion. The soft copy of the same should be submitted through the Online Research Information System.


GODFREY P. KALERWA., MSc, MBA, MKIM
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The County Commissioner
Vihiga County.

The County Director of Education
Vihiga County.

National Commission for Science, Technology and Innovation is ISO9001:2008 Certified

THIS IS TO CERTIFY THAT:
MS. ELIZABETH SISIANOI KILELO
of MASINDE MULIRO UNIVERSITY OF
SCIENCE AND TECHNOLOGY, 0-50100
KAKAMEGA,has been permitted to
conduct research in Vihiga County
on the topic: STAKEHOLDERS
INFLUENCE ON FOOD SECURITY IN
VIHIGA COUNTY, KENYA

for the period ending:
10th September,2020



Applicant's
Signature

Permit No : NACOSTI/P/19/27395/31796
Date Of Issue : 10th September,2019
Fee Recieved :Ksh 1000





Director General
National Commission for Science,
Technology & Innovation

APPENDIX IIIV: VIHIGA COUNTY APPROVAL

COUNTY GOVERNMENT OF VIHIGA



DEPARTMENT OF AGRICULTURE, LIVESTOCK, FISHERIES & COOPERATIVES

Telephone: 0726986858
Email: co.vihigadoalfc@gmail.com

P.O Box 237
MARAGOLI.

When replying please quote:
Ref: No.MOA/CHFO/STAFF GEN/VOL3/

20th June, 2019

Elizabeth Sisiano Kilelo
Masinde Muliro University of Science and Technology
P.O Box 190-50100

To whom it may concern

RE: PERMISSION TO CONDUCT RESEARCH IN VIHIGA COUNTY.

The above named is a post graduate student from MMUST of registration NO: HNP/G/01-57281/2016 seeking to conduct a research entitled 'Stakeholders influence on food security in Vihiga County'

She has acquired permit from Directorate of postgraduate studies and from Institutional ethics review Committee (IERC) from the University, approval from the Chief Officer Department of Agriculture, Livestock, Fisheries & Cooperatives Vihiga County to conduct research is given.

Kindly accord her any necessary assistance.

Thanks


Pamela K. Busungu
Chief Officer,
Dept. Agriculture, Livestock, Fisheries & Cooperatives.
VIHIGA COUNTY GOVERNMENT.

C.C

- Assistant Chief – Vihiga sub-county
- Assistant Chief – Hamisi sub-county

APPENDIX XI: THE MAP OF VIHIGA AND HAMISI SUB-COUNTIES

