# STAKEHOLDERS' CHARACTERISTICS INFLUENCING THE IMPLEMENTATION OF FOOD SECURITY PROJECTS IN VIHIGA COUNTY, KENYA.

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**A Thesis submitted to the School of Public Health Biomedical Science and Technology in Partial Fulfillment 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**

**AUGUST, 2024**

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## DEDICATION

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

## ACKNOWLEDGMENT

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## ABSTRACT

World food security will exist when all people have physical and economic access to safe, sufficient, and nutritious food all the time to meet their nutrient needs and preferred foods for optimal health. Approximately two billion of the eight billion people worldwide are food insecure. Food security mainly depends on the growth and distribution of nutritious foods. Food security has been a great challenge in Kenya due to natural hazards, conflict, and population growth. The general objective of this study was to determine Stakeholders' characteristics influencing the implementation of food security projects looking to identify the distribution of agriculture projects supported by stakeholders in Vihiga, assess how farmers' education levels influence food security projects, determine how land ownership affects the implementation of food security projects, and examine the performance of agricultural policy in the realization of food security in Vihiga County, Kenya. The study adopted a descriptive cross-sectional survey using mixed methods of data collection. Qualitative data were obtained from 30 purposively selected stakeholders through focus group discussion and key informant interview guides. The themes formed from the qualitative data were analyzed manually, and verbatim quotes were used to explain the findings. Additionally, 273 structured questionnaires were administered to farmers to collect quantitative data. The results were analyzed using Statistical Package for Social Sciences (SPSS) version 26. The data revealed that the main agricultural project was the National Agricultural Rural Inclusive Growth Project (NARIGP), which majored in dairy, local chicken, banana, and vegetables. The findings from the farmers showed that 66.67 % were beneficiaries of these programs, 48% were supported by indigenous vegetables and 4% were engaged in dairy farming. Further, the study found that there was unequal program coverage at 55.7 %, indicating that program distribution was just to a minimal extent. 35.5% reported that the distribution was moderate, while 8.8% said programs were distributed to a great extent. Pearson's chi-square test indicated a strong relationship between education level and farmers' awareness of key agricultural programs (*p-value of 0.000*). There was a strong association between education level and farmers' knowledge of key program supporters (*p-value of 0.003*). Land ownership was a significant challenge from the findings, as 35.5% reported owning less than 0.5 acres of land. Moreover, although food and agriculture policies are in place, gaps exist in implementing and adhering to these policies. About 48.4% were unfamiliar with existing policies, with 36.6% agreeing that project outcomes could be better if policies were well implemented. 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%. This study recommends capacity building of farmers to support smart agriculture, using technological methods to increase productivity on small land. Additionally, stakeholders must create policy strategies, collaborate, and develop program distribution mechanisms to promote nutrition and agriculture projects and improve food security.

## TABLE OF CONTENTS

## LIST OF TABLES

## LIST OF FIGURES

## ABBREVIATIONS

**AIVs:** African Indigenous Vegetables

**ALVP:** African local Vegetable programs

**ASAL:** Arid and Semi-arid Land

**ASDSP:** Agriculture Sector Development Support Programs

**ANI:** Accelerating Nutrition Improvements

**AU:** United Nations

**CIDP**: County Integrated Development Plan

**CNAP:** County Nutrition Action Plan

**CSFIP:** County subsidies farm input program

**CHVs:** Community Health Volunteers

**ECA:** Economic Commission for Africa

**ECD:** Early Childhood Development

**FAO:** Food and Agriculture Organization

**FDGs:** Focused Group Discussions

**FSB:** Food Security Bill

**GOK:** Government of Kenya

**GFSI:** Global Food Safety Initiative

**GDP:** Growth Domestic Product

**IFPRI:** International Food Policy Research Institute

**KALRO:** Kenya Agriculture and Livestock Organization

**KARI:** Kenya Agricultural Research Institute

**KII:** Key Informant Interview

**LANEA:** Leveraging Agriculture and Nutrition in East Africa

| | |
|---|---|
| **MMUST** | Masinde Muliro University of Science and Technology |
| **IFAD** | International Fund for Agricultural Development |
| **IREC** | Institutional Research Ethics Committee |
| **MOA:** | Ministry of Agriculture |
| **MOH:** | Ministry of Health |
| **NACOSTI** | National Commission for Science, Technology and Innovation |
| **NARGIP:** | National Agriculture Rural Inclusive Growth Project |
| **NFNSP:** | National Food and Nutrition Security Policy |
| **NGO:** | Nongovernmental Organization |
| **ROP:** | Rural Outreach Program |
| **SDGs:** | Sustainable Development Goals |
| **SSA** | Sub-Saharan Africa |
| **SOFDI:** | Sustainable Organization Farming and Development Initiatives |
| **UNICEF:** | United Nations Children's Fund |
| **WFP**: | World Food Programme |

## OPERATIONAL DEFINITION OF TERMS

**Food Security-** Timely availability and accessibility of nutritious food in sufficient quantities.

**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.

**Beneficiaries:** A group among the stakeholders who will directly or indirectly benefit from the project;

**Implementation:** is the realization of an application or execution of a plan, idea, model, design, specification, standard, algorithm, program, or policy.

**Policy**: Refers to a guiding statement that will provide direction and thrust on what should be done to either solve a problem or to accelerate certain developments in a given sector

**Projects:** Refers to a major activity encompassing many small activities undertaken to achieve the major activity. For example, the National Agriculture Rural Inclusive Project is a major activity with other smaller activities like Dairy farming projects, African Indigenous Vegetables farming, Chicken and Banana farmin

# CHAPTER ONE

## 1. INTRODUCTION

### 1.1. Background of the study

World food security will exist when all people have physical and economic access to safe, sufficient, and nutritious food all the time to meet their nutrient needs and preferred foods for optimal health. (NFNSP 2011). Approximately two billion of the eight billion people worldwide are food insecure. (FAO 2022).

Food security means having physical and economic access to enough food to meet the nutrient needs for good health (Chege et al., 2016). For almost half a century, Africa has struggled with food insecurity issues contributed by several factors, including distribution challenges, continuous climate change, little success in agriculture, and the inability and lack of interest to act by local officials (Fuglie et al., 2020). There is still no good solution, locally or internationally, to curb the disaster. Since food aid started in Africa in the 1950s, the problem has been described as a supply affair (SFSNW,2022).

Food security will be pressured more as the global population reaches nine billion by 2050. Additionally, climate change has contributed to the increasing challenges of food insecurities. Climate change interferes with crop production, increases the spread of pests and diseases, and 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 global hunger and malnutrition in all its forms by 2030 (FAO 2020). The state of food

security and nutrition worldwide estimated that the food security challenge significantly 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). Many poor people around the globe are small-scale farmers who primarily rely on agriculture as their primary source of livelihood (McLennan & Group, 2022).

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 downgrade food security improvement efforts in SSA (Fuglie et al., 2020).

Implementing food security projects in developing countries has been considered a target to improve agriculture productivity (Kaptui & Omondi, 2018). There, however, aspects that influence the implementation and success of this project (Omolo, 2015; Baptista & Farid,2022). A study was conducted to investigate the challenges facing project implementation in Ghana. The study reported Factors ranging from inflation, project complexity, inaccurate material estimation, financing, change orders, design changes, late submission of materials, poor specification, incorrect area information, poor governance among many others, were found to be the primary sources of overruns (Kaptui & Omondi, 2018).

In Kenya, projects targeting food security are 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 (GNR, 2017). However, the stakeholders' support level and increase in food security are not commensurate (Ndirangu, 2016). The Kenyan agriculture sector accounts for 51% of Kenya's GDP and 60% of the country's employment. Despite living in an agricultural-based economy, a quarter of the Kenyan population suffers from food security problems (Waage et al., 2013; Birch, 2018). Implementing agricultural policies to facilitate project outcomes has not been successful and therefore limits policymakers' and stakeholders' ability to act (Mohamed 2018, Ministry of Agriculture, 2019).

In Vihiga County, approximately 64% of their income is from agriculture. Agricultural produce remains below its potential output and decreases over time (*VMIDP*, 2022). For example, the current estimate of maize production in Vihiga County is four bags per acre, but its prospective production per acre is 15 bags (Pelto & Thuita, 2016). Farmers fail to acquire their annual food needs and rely on neighbouring counties to meet the deficit (World Bank 2020, Birch, 2018). This study sought to identify stakeholders' characteristics influencing the implementation of food security projects in Vihiga County, Kenya**.**

## 1.2. Problem statement

Global food insecurity is rising despite initiatives to curb the issue (Turner et al., 2013). There have been several food security projects in Vihiga County that are expected to affect the food security status. However, 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 the food security situation in the county and to cause increased productivity in agriculture. The County receives moderate to high rainfall. Projects like farm inputs provisions such as the supply of seeds and fertilizer, dairy farming, vegetable and banana farming from government, non-governmental organizations, and other stakeholders have been done in the county. Still, sustainability remains a challenge in attaining food security (Birch, 2018). The current estimate of maize production in Vihiga County is four bags per acre, but its potential production 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 farmers who are beneficiaries of the food security project interventions have often been unable to remain independent and continue farming without support after the projects end the target period, and achieving food security has remained 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 characteristics influencing the implementation of food security projects in Vihiga County, Kenya,

analyzing the distribution of programs, assessing how farmers' education levels influence food security projects, determining how land ownership affects the implementation of food security projects, and examine the performance of agricultural policy in the realization of food security.

## 1.3. The study Objectives

### 1.3.1. Broad Objective

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

### 1.3.2. Specific Objective

The specific objectives of this study were to:

i. Establish the distribution of agricultural projects in Vihiga County, Kenya
ii. Assess farmers' knowledge levels and their influence on food security projects in Vihiga County.
iii. Determine land ownership and its effects on implementing food security projects in Vihiga County, Kenya.
iv. Establish Performance of agricultural policy in the realization of food security in Vihiga County, Kenya

## 1.4. Research Questions

i. What is the distribution of agriculture projects in Vihiga County, Kenya?
ii. Does the farmers' knowledge levels influence the implementation of food security projects in Vihiga County?

iii. Does land ownership affect the implementation of food security projects in Vihiga County, Kenya?

iv. What is the performance of agriculture policy in realizing food security?

## 1.5. Justification of the study

Despite having several food security projects and a well-suited environment, Kenya does not produce enough agricultural produce for its population. The agriculture sector accounts for 51% of Kenya's GDP and 60% of the country's employment (Birch, 2018, Faso et al., 2015). Most research is about food security dimensions, including availability, accessibility, utilization, and stability (Peng & Berry,2018, Dimensions, 2021), but less on food security projects and the characteristics that hinder the implementation of projects meant to improve food security. This study was done to support developing partner's project interest (The Alliance of Bioversity International and CIAT) in Mapping Nutrition and Agricultural stakeholders and their influence on food security projects to assist in getting information on project distribution and where to focus in the provision of services and to identify ways to improve agriculture productivity to its prospective production in the County. Vihiga County has had an unusual reduction in agriculture productivity in recent years, making it difficult to attain food security (Cholo et al., 2019, Lawrence & Omuse, 2021, Integrated & Plan, 2018)). Agricultural projects upon nutritional outcomes and food security stability have not been demonstrated (Poole et al., 2018). Evidence of agricultural policy utilization from other studies is limited (Cholo et al., 2019). This study will be a resource in knowing why food security project implementation and food security increase do not correspond.

## 1.6. Significance of the study

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

This study might also help locate gaps in project coverage, services offered, and plans for allocated funding in the county and build collaboration and synergy among stakeholders to promote effective agricultural and nutrition programs. Additionally, the study may help monitor ongoing food 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 the private sector and non-governmental organizations 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, who were labelled as top-level stakeholders, and beneficiaries of these projects were labelled as lower-level stakeholders. The study was to determine the characteristics of

stakeholders that influence the implementation of food security projects 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. It also depended on participants' willingness to give information in the KII, FDG, and questionnaires to gather data.

### 1.7.2. Delimitations

The study was delimited to stakeholders who specifically supported agriculture and nutrition programs in Vihiga County to promote food security. It focuses on stakeholders from the Ministries of Health and Agriculture, 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

### 1.8.1. Stakeholder Theory

According to Hodgkins et al. (2019), Stakeholders are those groups without whose support the program would cease to exist or are those groups that are vital for the survival and success of a program or any group or individual who can affect or is affected by the achievement of general objectives of the program. Stakeholder theory is a perspective, a set of ideas, expressions, and metaphors related to maximizing stakeholder value (Haataja, 2020; Lawrence & Omuse, 2021). The theory emphasizes the ‘jointness’ of interests upon which the completion of a particular project depends. If one stakeholder

pursues its interests at the expense of others, then the others with either withdraw their support or look to create another network of stakeholder value creation (Haataja, 2020; Boedecker et al., 2021)

According to Ruwa (2016), the stakeholders' theory may be helpful in strategic decision-making and in making stakeholders' management fair, which is essential in running projects. However, the stakeholders' theory doesn't have an answer to program ethics. Stakeholder theory gives farmers more resources and an excellent capability to deal with their challenges because they can offer financial rewards, language, and action to show that they value relationships with other groups and work to advance their interests over time. Most Organizations have used stakeholders' theory to run successful projects. When stakeholders cooperate on a particular project, their tasks become much more manageable. Stakeholder theory claims that whatever the ultimate aim of the corporation or other form of program activity must consider the legitimate interests of those groups and individuals who can affect or can be affected by their activities (Heath & Norman, 2015). Hence, stakeholders are important in the strategy implementation of food security, as they can contribute to physical resources, policy advocacy, financial resources, strategic decision-making, and other relevant support for the success of projects.

## 1.9. Conceptual Framework

The conceptual framework illustrates the relations between independent and dependent variables. The study presents implementation of food security projects as the dependent variable.

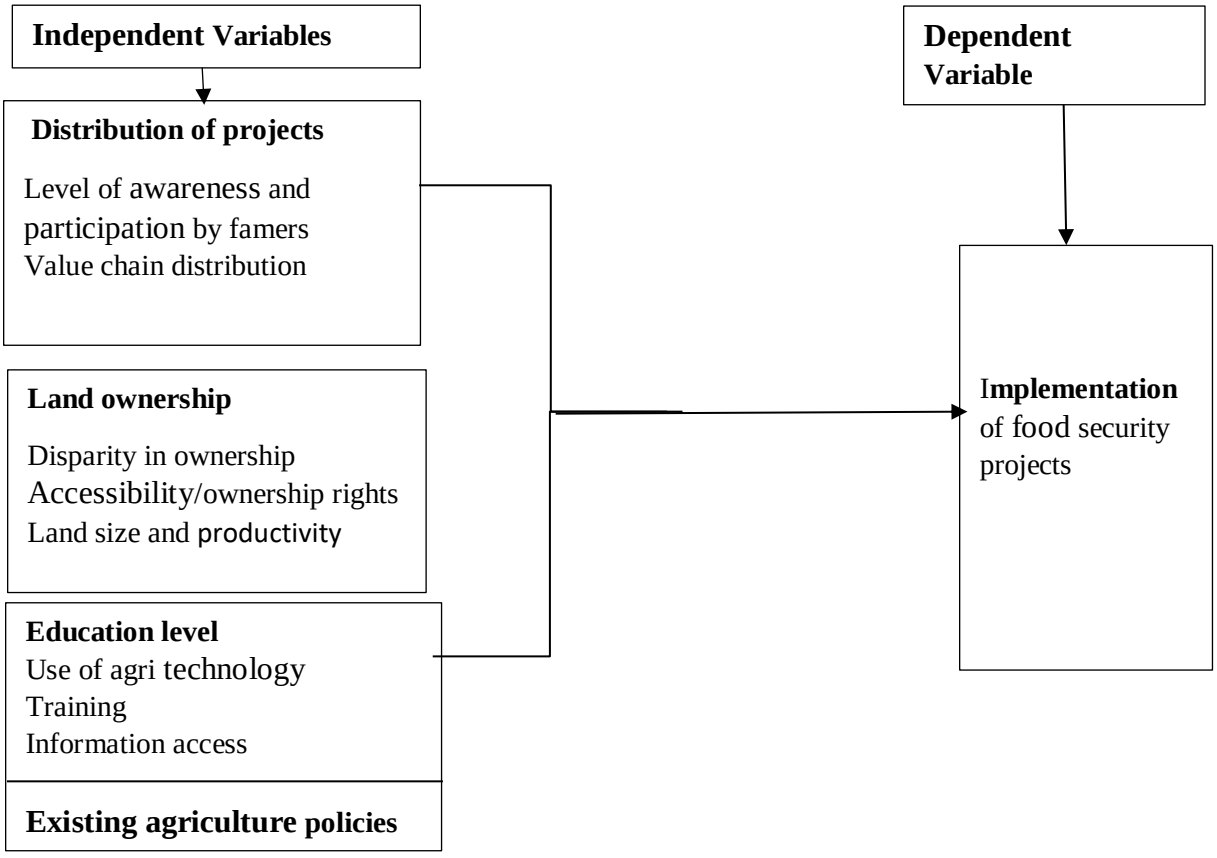



**Figure 1.1: Conceptual Framework (Researcher, 2024)**

# CHAPTER TWO:

## 2. LITERATURE REVIEW

### 2.1. Introduction

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

### 2.2. Distribution of food security projects

Several stakeholders have brought in experts to assist in training and research and facilitate 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. However, we still worry that food security issues are a significant stumbling block. Vihiga county development plan shows some projects have been prioritized, such as the National Agriculture Rural Inclusive Growth Project (NARIGP), the Agricultural Sector Development Support Programme (ASDSP), and government institutions such as the Kenya Agricultural and Livestock Research Organization (KALRO) (KCCR, Vihiga County, 2020). These projects supported four major value chains: African indigenous vegetables (AIVs), indigenous chickens, dairy, and bananas (KCCR, Vihiga County, 2020).

According to an assessment report from a non-government organization operating in the County of Vihiga that provides financial assistance to farmers, just 35% of crop projects initiated by farmers in Vihiga are believed to be sustainable (Vihiga County, 2017). Gatonye (2017) noted that over 35% of the donor-funded projects in Kenya had recorded high failure rates over the year. According to the World Bank (2016), most agriculture projects launched in Vihiga County in 2016 were to be completed by 2019. Still, only a few of these projects have been conducted over a year since the set timeline elapsed. The county government has denounced the slow uptake of project-funded activities and challenged beneficiaries to embrace best practices learned through the training and knowledge distribution channels (Aluda, 2021)

**Table 2. 1 Current Agricultural Projects in Vihiga County**

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

Several projects in Vihiga County are working on climate change, agriculture, nutrition programs, and food security (Integrated & Plan, 2018). Their input included research activities, community empowerment, improving market links, providing credit services,

and providing 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

Previous studies on food security projects have mainly focused on climate change, agriculture, and food security dimensions, with little attention paid to the distribution of food security projects. Therefore, there exists a knowledge gap which this study sought to fill by establishing the distribution of food security projects in Vihiga County, Kenya.

## 2.3. Education Level and Food security Project

Knowledge and skills given to farmers and other stakeholders about agriculture, nutrition programs, and farming methods will improve agriculture productivity and nutrient intake (Mbwana et al., 2017). The finding is also supported by another study by Hameed & Sawicka (2016), which states that training and proper education play a significant 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 farming trends and various agricultural and nutrition programs. People acquire skills that help them in problem-solving (Hameed & Sawicka, 2016). Gwada et al. (2020) stated that one can access information through reading and listening. The level of education of an individual affects their income. The more educated a farmer is, the more likely they are to be rich (Amao & Amaeshi, 2008b).

The lack of education is believed to be the fundamental cause of poor agricultural development and food insecurity in developing countries (Hameed & Sawicka, 2016). Education contributes significantly to sustained rural income growth. Education increases

the ability of farmers to allocate resources more efficiently and helps to develop the flexible skills needed to participate in knowledge-intensive agricultural activity (Asena et al., 2017). Education promotes constructive problem-solving, abstract thinking, and understanding of the causal relationship between technology inputs and agricultural outputs.

Training is also essential to help farmers adopt new farming methods with the rising challenges of climate change (Wiggins et al., 2010). Climate change affects agricultural produce's development 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). For example, 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 officer is always armed with fresh and new techniques and messages for his clients. Their approach 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 development projects, policies, and

strategies. This situation creates a communication gap that always affects productivity. It slows farmers' efforts to improve agriculture productivity (Gelli et al., 2015). (2015) observed that different stakeholders also show a key interest in improving extension services so that farmers have diverse options 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).

Food insecurity continues to feature in the global agenda, with particularly close attention being paid to the determinants of food insecurity. However, the effect of education is mixed and remains understudied. This study sought to establish farmers' knowledge levels influencing the implementation of food security projects.

## 2.4. Land Ownership and Food Security

Increased agricultural productivity can enhance household food security and nutrition through two avenues: directly, through increased food production for consumption, and indirectly, through increased incomes permitting the purchasing of more and better quality food. In both ways, secure land rights can help moderate the impact of food price volatility on poor rural households (Mota et al., 2019).

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. Improving the intake of nutritious food provides the energy needed for activities, growth, and body maintenance.

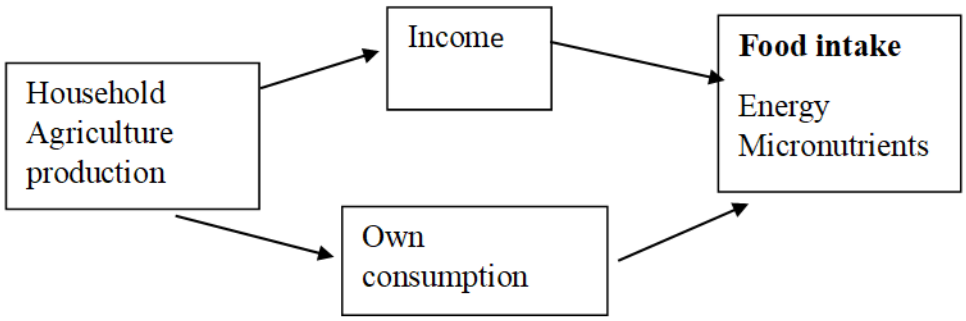



**Figure 2. 1 Food production chain**

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. They sometimes spend more than half their budget on food (Fuglie et al., 2020; Haddad, 2000). The high rate of the growing population of Vihiga County has put a lot of pressure on the available land. This has led to continuous land subdivisions, thus reducing the economical use of land for agricultural purposes (County Government of Vihiga, 2019). Currently, 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.

Land quality has been found to provide a good yield. In most areas, farms are of relatively poor quality and require chemical fertilizer (Hameed & Sawicka, 2016). A study was done on urban agriculture as an alternative food security strategy in Kampala. Access to land significantly positively affected the nutritional status of children in farming households than non-farming households of different income groups (Varela et al., 2022).

It also found a significant effect of land holding on calorie availability or production. The result indicated that farming households with access to land had better food security in terms of better nutritional status and calorie availability. The food security effect was even more pronounced in low-income (poor) households (Maestre et al., 2017b). This is also in support of the results obtained by Comparing the very low-income group of households among farming and non-farming households; a significantly higher level of short-term food sufficiency was observed in the very low-income group of the non-farming households than in farming families, despite the same spending on food per person per day. This was due to the availability of un-purchased food from farming (Mota et al., 2019).

In Vihiga County, Most farmers do not own flat lands. They are cultivated on steep slopes, leading to soil erosion and environmental degradation (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. Farmers have limited access to inputs, such as certified seeds and fertilizer, required for optimal crop production (McLaughlin & Kinzelbach, 2015). In addition, over time, low budgetary allocations to the agricultural sector have led to weak extension linkages due to inadequate extension services (Kenya National Bureau of Statistics, 2018).

Individuals and the government largely privately own land in Vihiga County. The percentage of title deeds stands at about 28%, with low ownership by women and youths due to cultural barriers, and the rest is still under the ownership of grandparents who have yet to distribute it (County Government of Vihiga, 2018). A lack of title deeds for most

women farmers blocks access to the resources necessary to enhance crop and livestock productivity.

Many credit firms issue financial assistance to farmers with credible documents for the parcels of land they purport to own. Without a title deed, there is no access to financial aid, which disappoints the farmers and the agricultural sector (ASDSP, 2014). The average farm size in Vihiga County is 0.4 ha (approximately 1 acre) for a small-scale farm and 3 ha (7.4 acres) for large-scale farming. Massive environmental degradation results 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).

However, a clear understanding of land ownership in terms of size owned and what is used for agriculture is lacking due to the absence of adequate data, as most literature gives information on land ownership regarding land quality, title deeds, and topographical flow. This study seeks to address this research gap.

## 2.5. Agriculture policies and food security

Agricultural and nutrition-related policies can have significant effects on household food security. Africa's agricultural and food security crisis is mainly connected to policy failure and 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 and the lack of adequate food for everyone in Kenya has posed an insignificant impact on the existence of most policies related to food security in Kenya.

The constitution of Kenya acknowledges the right to adequate food of acceptable quality as a fundamental and essential right of citizens. (The Government of Kenya, 2010). The country is still far from this law, and many Kenyans suffer from food insecurity issues

Vision 2030 aims to have a competitive world with a prosperous nation enjoying a high quality of life. Agriculture is targeted as the central economic pillar towards realizing this vision. (The Government of Kenya, 2010). The primary goal of the food and nutrition security policy was to ensure food and nutrition security for all Kenyans. This policy was to be achieved through sharing and relating with the Agricultural Sector Development Strategy (ASDS) formed in 2010 (Strategy, 2019). The National Nutrition Action Plan (NNAP), formed in 2012, was also to implement the policy. The main aim was to implement nutrition-sensitive food security intervention and to ensure food and nutrition security for all Kenyans. There was no proposal on nutrition-sensitive agricultural interventions for ASDS and NNAP, and there was no harmonization. Additionally, there was no presentation of specific plans favouring small-scale farmers, who comprise most of the rural poor and food-insecure population.

The Maputo Declaration, July 2003, was a Commitment for African nations to commit 10 per cent of the national budgetary allocation to agriculture and rural development policy implementation within five years. 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 allocated 378.4 million USD to the sector, a decrease from 564.9 million USD in 2021-2022. Agricultural growth rates are still below 6% (Deloitte, 2022).

The government agenda on food security as one of the big 4 was to focus on initiatives that guarantee 100% Food and Nutrition Security 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 and raise the manufacturing sector's share of GDP to 15 percent by 2022 (Government of Kenya, 2020). It's 2023, and not much has been achieved. The Country and Vihiga County still suffer from chronic food insecurity, and poor nutrition persists,

## 2.6. Research Gap

For many years since independence, NGOs, CBOs, government agencies, and donor agencies have been visible in most counties in Kenya, where food security projects have been initiated and implemented. However, these projects have not yet achieved the defining objective of food security. Most of these projects have had a short life-span, stopped running, never impacted the beneficiaries in the community, or collapsed altogether. Previous studies conducted on food security projects have mainly focused on leadership and management challenges with little attention on the distribution of the projects, the performance of policies, and characteristics influencing implementation, such as education levels and landownership of the beneficiaries. Therefore, there exists a knowledge gap, which this study sought to fill by determining the characteristics of stakeholders that influence the implementation of food security projects in Vihiga County, Kenya.

## CHAPTER THREE:

# 3. RESEARCH METHODOLOGY

## 3.1. Introduction

The chapter describes how data were obtained, processed, analyzed, and interpreted to answer the study's objectives. The methodology elements considered herein include study area, study design, study population, sample size determination, sampling design and strategies, Data collection, Pilot study, validity and reliability of the instruments, data analysis techniques, and ethical considerations.

## 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 (CIDP, 2023-2027). It covers an area of approximately 531 $Km_2$ with an annual rainfall of between 1800mm-2000mm and 24 degrees centigrade. It borders Nandi County to the East, Kakamega County to the North, Siaya County to the West and Kisumu County to the South.

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/$km^2$. The male accounts for 48.1 % while the female 51.9%. The population is expected to grow to 604,777 by 2023 (County Government of Vihiga, 2019). The main economic stay of Vihiga County is subsistence agriculture, including crop and livestock farming. The main food crops are maize, bananas, beans, and horticultural. Economic activities include trade and commerce (CIDP, 2023-2027).

## 3.3. Study design

This study adopted a cross-sectional survey. Data was collected to find the distribution of agricultural projects, farmers' knowledge levels, and their influence on food security projects, land ownership, and its effects on the implementation of food security projects and to establish the performance of agricultural policy in realizing food security.

## 3.4. Study population

The target population for the study was stakeholders in Vihiga County who supported, implemented, and benefitted from food security projects and policies. They are represented in the table below according to their level of influence.

**Table 3. 1 Stakeholder grouping according to formal power**

| | **KII respondents** |
|---|---|
| **Cluster 1 (policy influencers & program implementers)** | County Director of Health Services,<br>County Director of Agriculture,<br>Director (ROP)<br>Director (SOFDI)<br>County nutritionist coordinator<br>County Agricultural officers (Vihiga and Hamisi Sub-Counties) |
| | **FGD Respondents** |
| **Cluster 2 (Beneficiaries of programs)** | Community Health Volunteers<br>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.

## 3.5. Inclusion and Exclusion criteria

### 3.5.1. 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 were included in the study

### 3.5.2 Exclusion Criteria

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

## 3.6. Sample size determination

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

$$\mathrm{n} = \frac{z^2 p\mathrm{q}}{e^2}$$

$$\mathrm{n} = \frac{z^2 p(1-p)}{e^2}$$

$$\mathrm{n} = \frac{1.96^2 0.5(1-0.5)}{0.05^2}$$

$$\mathrm{n} = 384$$

Where n = Optimum sample size

Z= Normal variant associated with levels of significance.

e = Probability of error

p= the estimated proportion of farmers

q Is 1-p in this study, and the confidence interval is 95%

## 3.7. Sampling Procedures

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. Random sampling was then used on each ward to obtain a representative sample.

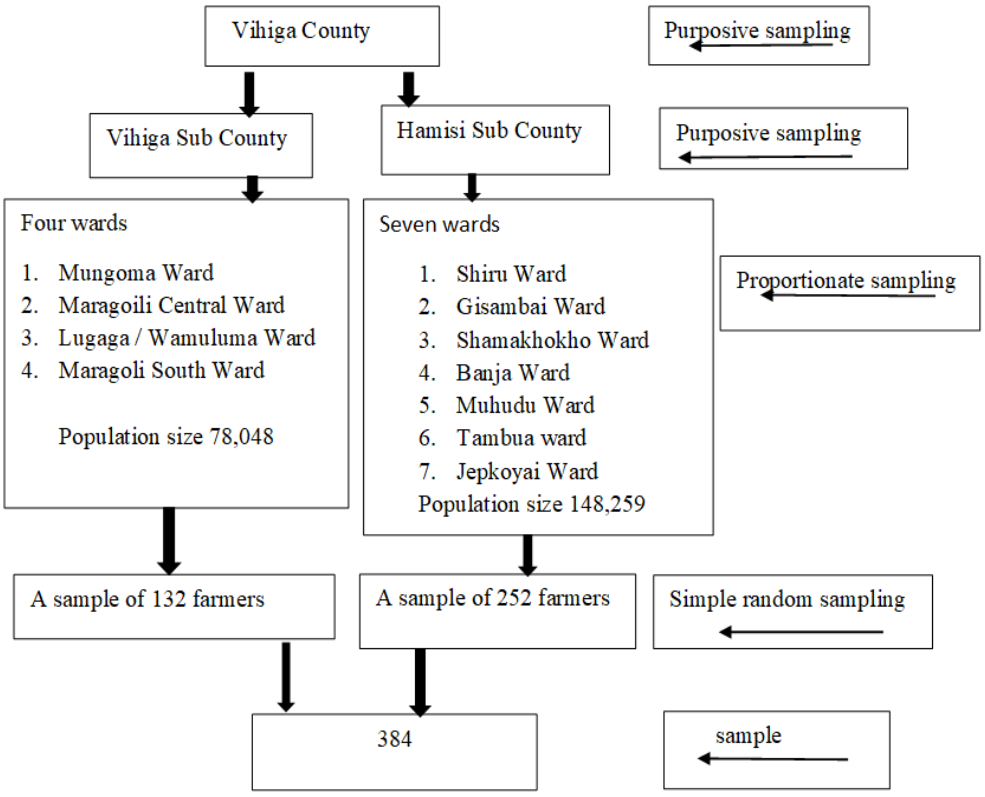
The study also purposively selected thirty (30) stakeholders to take part in Key Informant Interviews (KII) and Focus group discussion (FGD) since they give an in-depth understanding and lively experience of what goes on during the implementation of food security projects in the community.

**Table 3. 2 Sampling techniques for qualitative data**

| **Stakeholders** | **Type** | **Number of stakeholders interviewed** | **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 |

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 Sampling stratagies for quantitative data**




## 3.8. Data collection

### 3.8.1. KII and FGD

The key informant interview tool, which comprised a set of questions for each stakeholder, was used to interview the top-level stakeholders. Date and time were scheduled depending on the stakeholders' availability. The researchers targeted at least two daily interview sessions 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 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 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. The researcher typically merged the two data sets by combining the separate results in interpretation.

### 3.8.2. 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. A semi-structured questionnaire was used to gather data from the farmers supported by the specific stakeholders identified. The questionnaire was very useful in the collection of both qualitative and quantitative data. The questionnaire was structured into six (6) significant sections, as presented in the table below.

**Table 3. 3 Questionnaire major section**

| Section | Key Variable | Details of the Variable |
|---|---|---|
| Section 1 | Background Information | Sex, Age, Marital Status, Educational Level, Occupation Religion |
| Section 2 | Knowledge status | Existing Agricultural Programs, Program Supporters, Benefit Nature, Farmers Groups, Education level Extension Service Communication Channels, Training and Methods of Information Dissemination |
| Section 3 | Land size and ownership status | Land Size, Farming Land, Crops, Method of storage and preservation, Sufficient Food, Sources of Food, Food Importation, Cereals, Root and Tubers, Legumes, pulses and nuts, |

| | | |
|---|---|---|
| | | Vegetables, Fruits &Others Challenges, Food Shortage, Livestock, and products |
| Section 4: | Performance agriculture policy | Information and utilization of existing policies |

## 3.9. Pilot Study

A pilot study was carried out to test the validity of the tools and the clarity of the language, and the comments were put into consideration.

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

$$n = \frac{10}{100} x\ 384$$

$$n = 38.4$$

$$n = 38$$

Kakamega County was chosen because it has the same study environment characteristics as Vihiga County (stakeholders like farmers, agriculture officers, and agriculture projects). 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 the larger study.

Pilot interviews were done in the same area where different aspects of the interview (especially the interview guide, the interview site, and whether the interview can be audio-recorded) were tested with a small number of respondents (6), evaluated, and revised. This allowed the researcher to learn which wording or types of questions work

best and the best length of an interview with respondents who have trouble concentrating for an extended time or had limited time because of their nature of work. This method further assisted the researcher in knowing what challenges and issues were faced during the data collection process and in acquainting them with the settings of the actual field study. The tools and guides were revised accordingly before the main study, depending on the pilot testing results and interviews.

Ten research assistants were trained to guarantee their effectiveness in the data collection process. Two of them 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

Pilot study and Pilot interviews were conducted before the actual study to test the validity and reliability of the instrument. After the pilot study and pilot interviews, it was found that the validity and reliability were at a good level and accepted for use in the actual study. The instruments were given to experts in public health, nutrition, food science, and project management for validation. The experts were asked to evaluate the content of the instruments in terms of content validity. In this study, content validity measured the extent to which variables in the Likert scale measured what it was intended to measure, as was the right framing of questions.

### 3.11. Data Management, Analysis, and presentation

Thematic content analysis was used to analyze the qualitative data. This process involves analyzing transcripts, identifying themes within those data, and gathering together examples of those themes from the text. All transcripts and notes taken were scrutinized,

and results were validated by seeking alternative explanations from the participants to what appeared to be research results. The researcher further looked at common themes and sub-themes related to the study. These themes and sub-themes emerged as major findings from the qualitative data. Data from the questionnaires was cleaned, coded, and entered into the statistical package for social sciences (SPSS) version 26, and descriptive statistics were used for categorical Variables. Inferential statistics such as correlation and chi-square analysis were used to derive meaningful findings and conclusions.

**Table 3. 4 Data Analysis and Presentation**

| **Objective**<br>**Statistical Software Used** | **Data Presentation And Methods** | **Data Collection Tools** |
|---|---|---|
| 1. Thematic Content Analysis(Atlas.ti23) | • Quotation of expression verbatim and coding of common themes | • Key Informant Guide<br>• Focused Group Discussion guide |
| 2. SPSS Version 26 Thematic Content Analysis(Atlas.ti23) | • Descriptive analysis-Frequencies and percentages presented by tables, charts, and graphs<br>• Inferential statistic – chi-square<br>• Quotation of expression verbatim and coding of common themes | • Questionnaire<br>• Key Informant Guide<br>• Focused Group Discussion guide |
| 3. SPSS Version 26 Thematic Content Analysis (Atlas.ti23) | • Descriptive analysis-Frequencies and percentages presented by tables, charts, and graphs<br>• Inferential statistic – chi-square<br>• Quotation of expression verbatim and coding of common themes | • Questionnaire<br>• Key Informant Guide<br>• Focused Group Discussion guide |
| 4. SPSS Version 26 Thematic Content Analysis(Atlas.ti23) | • Descriptive analysis-– Likert scale<br>• Quotation of expression verbatim and coding of common themes | • Questionnaire<br>• Key Informant Guide<br>• Focused Group Discussion guide |

### 3.12. Ethical Consideration

Ethical clearance (MMUST/IERC/27/19) was granted by Masinde Muliro University Institutional Research and -ethics committee (MMUST-IREC). A research permit (No. NACOSTI/P/19/27395/31796) was obtained from the National Commission for Science, Technology, and Innovation (NACOSTI), Kenya. Permission to conduct the research was obtained from all the relevant administrative offices in Vihiga County.

The research aimed to benefit the county and general community by providing relevant information that will help in policy making, and that can be disseminated to them through workshops. The respondents were free to withdraw from the study at any stage and were not compensated for their willingness to participate. An informed consent process was carried out, and Privacy and Confidentiality was assured. The equitable selection of participants, benefits, and burdens of the study were distributed fairly. The researcher maximized benefits for the individual participant and society while minimizing the risk of harm to the individual and ensuring no intentional infliction of harm.

## CHAPTER FOUR:

# 4. PRESENTATION OF THE FINDINGS

## 4.1. Introduction

This section presents the findings of the study based on the objectives. Both the qualitative and quantitative results were integrated into the report.

## 4.2. Response rate of the Participants

The study targeted a sample size of 384 respondents, of which 273 responded to the questionnaires, making a total % response rate of 71%, as shown in Table 4.1. This was considered adequate because most farmers were not found in their households, and because of the remote nature of the areas, the researcher and the enumerators could not revisit the households in the selected wards. The targeted sample for the key informants was 10, but the researcher successfully interviewed 7 KII respondents while all the targeted samples on focused group discussion participated.

**Table 4. 1 Response Rate of the participants**

| **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 and 45, 5.1% were aged 46-55, and 33.7% were aged 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 primary source of income. Regarding their education, 26.4% of respondents were educated up to the primary level, 27.1% to the secondary level, and 24.9% to the college level. Christianity was the major religion among the respondents, 94.9%, 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. Existence and Distribution of Projects

Agriculture and nutrition projects are essential to improving 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 show that (n=182, 66.67%) were aware of the agriculture programs supporting food security in the county. Similarly, thematic analysis of qualitative data indicated that farmers are aware of the agricultural programs offered in the community. The farmers mentioned programs such as the Agricultural Rural Inclusive Growth Project (NARGIP) and Agriculture Sector Development Support Programs (ASDSP) that support agriculture and nutrition in their community.

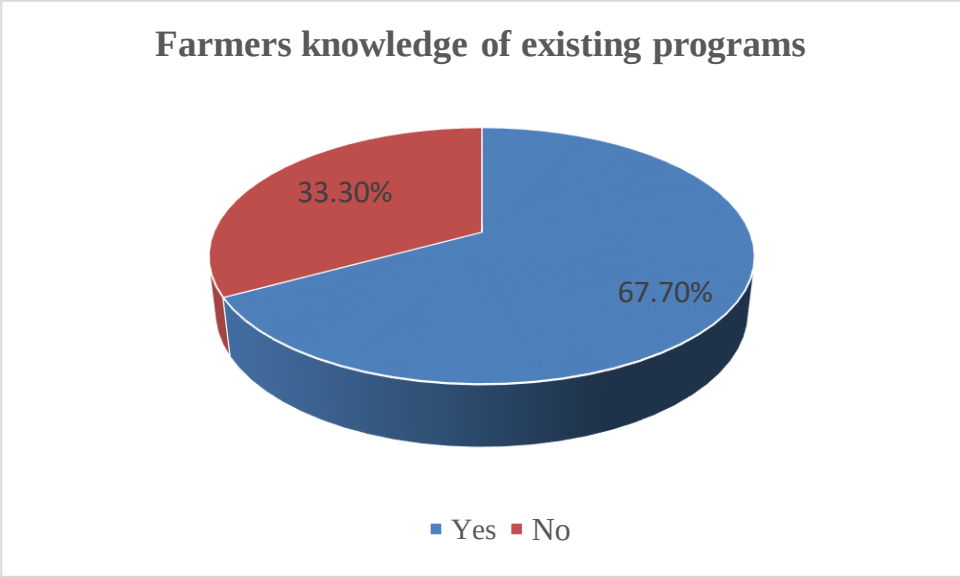



**Figure 4. 1 Farmers' Knowledge of existing programs**

### 4.4.1. Project Distribution and Beneficiaries.

The study found that program coverage was minimal, as a majority of the respondents, 55.7% (n=152), indicated that program coverage and distribution was just to a minimal extent. 35.5% (n=97) indicated that the distribution was moderate, while only 8.8%

(n=24) indicated that the program is distributed to a great extent. The focus group discussion results also revealed that these programs are poorly distributed, with minimal coverage. One of the farmers said, "*The program services are not equally distributed." (FGD, $F_7$)*

**Table 4. 3 Agriculture Project Distribution**

| | Frequency (N) | Percentage (%) |
|---|---|---|
| Minimal extent | 152 | 55.7 |
| Moderate extent | 97 | 35.5 |
| Great extent | 24 | 8.8 |

The study also looked at the program beneficiaries, and the results indicated that (n=205, 75.1%) were beneficiaries of these programs. The study also looked at the majority of the beneficiaries, whether they were just individual farmers or they belonged to a group or committee; from the findings, it is evident that the majority of the beneficiaries belonged to a farmers' group; however, few belonged to these groups but did not receive any support as a result of corruption and favouritism, this was highly evident during the focus group discussion. One farmer stated, "*Most of our farmers and households in this community are still very poor and never benefit from these programs. It's a matter of first come, first served, and a farmer's friendship with the distributors of the services, which for the fertilizers and seeds are mostly chiefs, then 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 miss the fertilizers and seeds." (FGD, $F_7$).*

**Table 4. 4 Agriculture Program Beneficiaries**

| | | Member of farmers' group. | | Total |
|---|---|---|---|---|
| | | Yes | No | |
| Beneficiaries of agricultural programs | Yes | 142 | 63 | 205 |
| | No | 40 | 28 | 68 |
| Total | | 182 | 91 | 273 |

However, some benefits require registration at a certain fee or waiting a long time before they enjoy the benefits as a group. One farmer stated, "*Not all farmers are engaged in this program. The benefit we mostly get from the county government is the supply of seeds and fertilizers, which is not always enough. First come, first served. They are not given for free, but a farmer has to register with ksh.500 even though one might end up missing" (FGD, $F_8$).* Another member stated, "I a*m a member of one farmers' group, and we have a dairy cow from the ASDSP. This cow is kept by one farmer who takes care of it on behave of the members. The farmers benefit from the cow's produce until it gives birth to a calf, then it's taken by the next farmer. It's a good program, but it takes time for all the farmers to benefit." (FGD, $F_4$).*

### 4.4.2. Project Value chains

Most of the agricultural programs identified in Vihiga County mainly supported Dairy farming, poultry farming, Banana farming, and the supply of seeds and fertilizers for 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. Most stakeholders also reported

that "*We have the National Agricultural Rural Inclusive Growth Project (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: Dairy, Poultry, and Banana Project (KII 1, 4, 6, 7)*. These were the results from the Key Informant Interviews conducted with stakeholders.

However, the Bananas project was not somewhat effective as the majority stated poor timing and delay of the seeds and fertilizer when it was time to plant and dress fertilizer. *We are delayed over weeks, interfering with our plans and farming seasons. We end up producing less. (f10).* For dairy farming, Farmers were to be in groups of five. A cow was given to one group member who cared for it and benefited from milk and manure till it bore a calf given to the next member. This project was ineffective for most farmers as it took ages before all members could benefit.

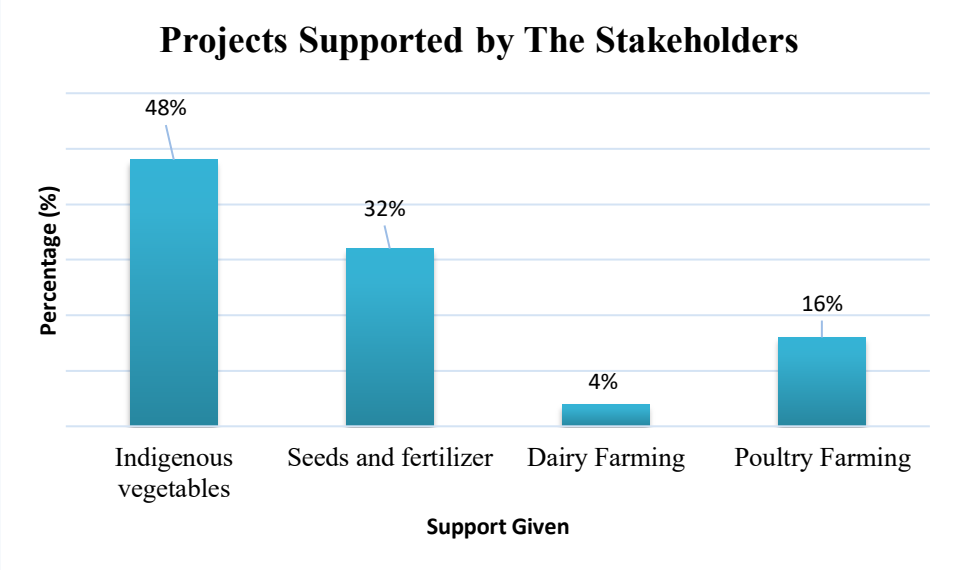



**Figure 4. 2 Project value chains**

### 4.4.3. Distribution of Agriculture Project.

The study also examined how well these projects are distributed within the community and whether they are accessible to everyone through KIIs and FGDs. The findings show that the programs are not well distributed in the community, with corruption and delays in supply being common, as reported by most of the stakeholders: Most of our farmers and households in this community are still very poor and *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, $F_{2,9}$)*

Another respondent reported *insufficient supply, and sometimes they delay the services past the appropriate time of planting the seeds and dressing the fertilizers. A farmer must receive 2 kg seeds, 10kg fertilizer for planting, and 10kg fertilizer for top dressing. If a farmer has bigger land, they must go to their pocket to add seeds and fertilizers. For those who use them appropriately, there are usually better yields than the rest. (FGD, $F_8$)*

Most programs target small-scale farmers, but these services rarely get to them. At the same time, there are delays by the top leaders responsible for overseeing the program distribution. A respondent noted that "*the programs target small-scale farmers, but that is not what necessarily happens at the grassroots level. Most of our small-scale farmers lack knowledge, skills, and information. Those trained do not train other people; some are paid to attend the workshops, seminars, and conferences" (FGD, $F_6$).*

Discussions with community health volunteers revealed the challenges in supporting their community, such as lack of resources, communication difficulties, and program

distribution issues. *"With the programs in place, the community is 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" ($CHV_5$)*

There exist biases where some farmers are involved in more than one project while others never get involved in any. *Few farmers are involved in different projects, and others are not involved in any project. Some are aggressive about joining groups, and our offices are biased toward some people, especially those who show interest and active participation when called upon (FGD, $F_3$)*

### 4.4.4. Program distribution and Farmer participation in agricultural projects

The chi-square test was done to identify the relationship between program distribution and farmer participation in agriculture in the community. The chi-square test gave $x^2$(2, n=273)>=0.042, with a p-value of 0.979, shows no significant relationship between program distribution and farmer participation in agriculture.

**Table 4. 5 Program distribution and Farmer participation**

| Independent variable | Chi-square value | Df | p-value |
|---|---|---|---|
| Program distribution | 0.042 | 2,n=273 | 0.979 |

Note: Dependent variable: Farmer participation in agricultural programs. Relationship significant at p>0.05

Correlation analysis was done to check the strength of association between the two variables. The results showed a weak association between program distribution and farmer participation in agricultural programs at (r=-0.012, P-value=0.060, P>0.05).

## 4.5. Education Level and food security projects

The researcher sought to understand if the farmers receive any agricultural extension services from the County Government of Vihiga as an initiative to promote food security. 81% (n=221) of the respondents reported receiving agricultural extension services from the County Government of Vihiga and Non-governmental organizations targeting agriculture. Most of these agricultural extension service providers (59.7%, n=163) communicate by word of mouth to the farmers, 15.4 % (n=42) use a radio or Television to pass information, while a few (7%, n=19) communicate by word of mouth.

The agricultural support programs in Vihiga County regularly hold agricultural-related training, and out of the sampled study respondents, the majority (78.4%, n=214) participate in this training, while a few (n=59, 21.6%) do not. The KIIs and Focus group results indicate that they provide training and education to farmers in the community. One of the SOFDI stakeholders said, "*We provide training and education on agriculture*" *(KII$_4$)*. However, one of the farmers noted that most programs focus on training small-scale farmers who do not even train other members, thus leading to lack of knowledge and skills from most of these farmers. "*The programs target small-scale farmers, but that is not what necessarily happens at the grassroots level. Most of our small-scale farmers lack knowledge, skills, and information. Those trained do not train other people; some are paid to attend the workshops, seminars, and conferences*." *(FGD, F$_1$)*.

The researcher also looked at the content of this training, and 39.6% (n=108)of the respondents reported that they are trained on seeds and fertilizer, 23.8% (n=65) on methods of farming, and 18.3% (n=50) of the respondents on agriculture innovation and new farming technology options. Several methods are used to deliver the training. From

an analysis of farmer's responses on methods used by agricultural support programs, the researcher found out that 30.8% (n=84) of the support programs adopt a farmer field school to deliver information, 30.4% (n=83) train and visit and 17.6%, (n=48) use a participatory approach.

**Table 4. 6 Access to information, knowledge, and training**

| Variables | | n | % |
|---|---|---|---|
| **Receive agriculture extension services.** | Yes | 221 | 81 |
| | No | 52 | 19 |
| **Communication channels used by agriculture extension service providers** | Radio/TV | 42 | 15.4 |
| | 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 approach | 48 | 17.6 |
| | Farmer field school | 84 | 30.8 |
| | Commodity approach | 1 | 0.4 |
| | None | 57 | 20.9 |

### 4.5.1. Education level and Agriculture Projects Supporters

The relationship between demographic characteristics and farmers' knowledge of key agricultural program supporters was determined using the chi-square test. Pearson's chi-square test gave $x^2$(4, n=273)>=91.045, with a p-value of 0.000, less than 0.05. The

finding shows a relationship between education level and farmers' awareness of key agricultural program supporters in the community.

A correlation was done to check the strength of the association between education level and farmers' knowledge of key agricultural program supporters. The findings showed a strong association between the two variables at (r=0.177, P-value of 0.003, less than 0.05). It is evident from these findings that farmers' knowledge of the availability of agricultural program supporters in the community must have a certain level of education.

## 4.6. Land ownership and food security projects

The findings from the study show that 35.5% (n=97) of the respondents own less than 0.5 acres of land, 17.6% (n=48) own between 0.5-1.0 acres of land, and 21.6% (n=59) own more than 2 acres of land. Similarly, most farmers from the focus group discussion mentioned that they have less land for farming, leading to increased food insecurity in the area. One of the farmers said, "*There is less land for agriculture" (FGD, $F_9$)*. However, a discussion with the Community Health Volunteers proved otherwise, as two of them mentioned that; "*As much as some households do not have land and no good health, others have big land but prefer to sell and buy foods. They are not willing to plant." (FGD, $F_{5,6}$)*.

On land division, most respondents (41.4%) reported using half of the land for farming, 30.4% using a small portion, and 18.3% using three-quarters of the land for agriculture. Findings from the focused group discussion pointed out that land issues have always been challenging in Vihiga County. This has also contributed to the increasing population of household members and, thus, the high rate of land divisions; as one of the farmers reported, "*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 remaining part is where I plant maize and vegetables." (FGD $F_2$).* Another farmer also mentioned, "*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 $F_6$).* This clearly shows that the county has limited land for agricultural practices, making implementing agricultural projects in the community difficult.

**Table 4. 7 Land Ownership**

| 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** |

### 4.6.1. Land size and distribution of extension services

Analysis of variance was done to check whether there is a statistical significance between land size and the distribution of extension services in the community. The results show that mean land size was statistically significance to the methods used by agricultural programs to distribute extension services to farmers in the community ($F_{2,}$ 270=5.760, P<0.004). To determine which mean were different, a post hoc analysis was done, and

the results show a statistically significance difference between the distribution of extension services direct to households and those distributed through groups or committees P=0.003. However, there was no significance between the extension services distributed directly to households/individuals, those distributed in groups/committees, and those distributed through the local government/traditional leaders (P=0.275 and P=0.162), respectively.

**Table 4. 8 Land size and Distribution of extension services**

| | Sum of Squares | Df | F | Sig. |
|---|---|---|---|---|
| Between Groups | 114.875 | 2 | 5.760 | 0.004 |
| Within Groups | 2692.240 | 270 | | |

## 4.7. Agricultural Project 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. From the findings, it is evident that most farmers, 48.4% (n=132), were not familiar with the existing agricultural and nutrition policies, and 46.5% (n=127) believed that stakeholders were not following any policies geared towards implementing agricultural projects. However, most % of the farmers, 36.6% (n=100) and 24.9% (n=68), indicated that if the policies are well implemented, they could have better projects supporting food security and nutrition. 49.8% (n=136) agreed that the stakeholders in place are committed to implementing agriculture policies, while 30.0% (n=82) strongly agreed. The mean score of responses from this section was

2.97, indicating that most farmers were undecided on the community's policies governing agriculture and nutritional programs.

**Table 4. 9 Programs Policies Implementation**

| Statement | Strongly Agree (%) | Agree (%) | Undecided (%) | Disagree (%) | Strongly Disagree (%) | Mean |
|---|---|---|---|---|---|---|
| • Familiarity with the existing agricultural and nutrition policies. | 1.5 | 10.6 | 3.7 | 48.4 | 35.9 | 4.07 |
| • Agriculture is the main pillar towards the realization of Vision 2030 | 22.0 | 52.0 | 8.1 | 16.8 | 1.1 | 2.23 |
| • Stakeholders refer to existing policies during the project implementation process | 5.9 | 7.3 | 1.5 | 46.5 | 38.8 | 4.05 |
| • If existing policies were well implemented, we could have better project outcomes | 36.6 | 24.9 | 4.0 | 30.8 | 3.7 | 2.40 |
| • Stakeholders are committed to developing and implementing the policies to achieve better project outcomes in Vihiga County. | 30.0 | 49.8 | 4.8 | 13.2 | 2.2 | 2.08 |
| Mean | | | | | | 2.97 |

However, results from KIIs indicate that 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.) as one of the mentioned; "*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)*

Regarding nutrition programs and policies focusing on maternal health and growth monitoring, there is a positive response to implementation, as reported by a stakeholder from the Ministry of Health. "*We have iron and folic acid supplementation, a program for pregnant women free during their antenatal clinics. We also have vitamin A supplementation given to women after delivery and children above six 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 minimum coverage and are biased, targeting only one school in the whole county. The Ministry of Health and SOFDI supports it. "*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 support the school feeding program. Stakeholders from the Ministry of Health and the CHVs who work under the Ministry of Health show equal efforts to support nutrition and agriculture programs. This clearly shows their understanding of how the programs could work together to promote food security.

# CHAPTER FIVE

## 5. DISCUSSION OF THE RESULTS

### 5.1. Introduction

This study aimed to determine factors that influence the implementation of food security projects in Vihiga County. The specific objectives of the study were to identify the distribution of agricultural projects supporting food security projects, to find out farmers' knowledge and its influence on food security projects, to find out how land ownership influences food security projects, and to examine the performance of agriculture and nutrition policy and how they influence the implementation of food security projects. This chapter summarizes the findings and provides a detailed discussion of the study objectives.

### 5.2. Discussion of the Findings.

The study aimed to determine the factors influencing the implementation of food security projects in Vihiga County. The study found that most respondents were aware of various agricultural projects supporting food security in Vihiga County 66.67%. Farmers mentioned projects such as the Agricultural Rural Inclusive Growth Project (NARGIP) and Agriculture Sector Development Support Programs (ASDSP) that support agriculture and nutrition in their community. In terms of distribution, most farmers 55.7% indicated that the distribution was to a minimal extent. The relationship between program distribution and farmer participation in food security programs was insignificant at $p=0.979$, with a weak association between the variables. Most of those who benefitted from the extension services provided by these projects belonged to a farmers group, 75.1%.

Other factors include farmers' knowledge and food security projects, revealing that most farmers had access to extension services. The relation between education level and farmers' knowledge of key food security programs was also significant (p=0.001). Only a few farmers owned more than 2 acres of land, with a majority having less than 0.5 acres. The relationship between land size and distribution of extension services was found to be significant at P-0.004. The study also assessed the existing program policies. The mean score from the responses indicated that most farmers were undecided on the current policies governing food security project implementation.

### 5.3. Distribution of Food Security Projects.

Agriculture and nutrition projects can improve food security in many communities, especially in developing countries like Kenya. Agriculture projects focusing on increasing food production and improving crop quality and diversity can help 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.

The study sought to find out about the existing projects and their distribution in Vihiga County. Several projects were mentioned, but a few appeared to be more familiar to all stakeholders. They included the National Agricultural Rural Inclusive Growth Project (NARIGP) and Local Vegetables and Agriculture Sector Development Support Programs (ASDSP). The findings about these projects were similar to the report from (KCCR, Vihiga County, 2020). These programs focused on four value chains: African indigenous vegetables (AIVs), indigenous chickens, dairy, and bananas. This is contrary to other projects from agricultural institutions such as (KALRO) which has more interventions,

including research and extension, capacity building, enhancing market linkages, offering financial and credit services, disease surveillance, 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 major challenge observed during KII and FGDs was inadequate human resources and poor stakeholder coordination. These findings are similar to a study carried out by KCCR in Vihiga County (KCCR, Vihiga County, 2020)

Distribution and coverage of these programs was also a significant challenge as 55.7% (n=152) reported that program distribution was just to a minimal extent. Some areas are within the interior, and the roads are impassable. This makes it difficult to access such areas. Anderson observed similar findings in his study, where he found out that most developing countries that practice small-scale farming are topographically dispersed; hence, the coverage and distribution of programs become tedious and costly when travelling to reach farmers (McDermott et al., 2015).

Further findings from the FGD confirmed that the distribution of program services in the community is unequal. Some farmers and households receive services, while others do not. There is often corruption and favouritism in the distribution process. Additionally, there was an inadequate supply of services such as seeds and fertilizers, from which 32% of the population benefitted. Services are sometimes delayed, causing farmers to miss the appropriate planting or dressing season. However, there are fewer findings about program distribution and coverage, and this study concludes this challenge exists in Vihiga County, especially in programs dealing with agriculture.

The Chi-square test was done to check the relationship between program distribution and farmer participation in food security projects. However, findings showed no relationship between program distribution and the participation of farmers in these projects. The researcher further checked the association between the two variables, and the results showed a weak association between the variables.

## 5.4. Education level and Food security projects

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 farming trends and 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 and nutrient intake. The above finding is also supported in another study by Sawicka & Hameed, 2015 that training and proper education play a significant role in influencing the nutrition and agriculture programs to improve food security.

Findings from this study show that most farmers have been educated and trained in different ways to improve agriculture. 78% of the farmers in this study had undergone training on agriculture innovation, new farming technologies, farming methods, seeds,

and fertilizer options. Amao & Amaechi, 2008a said that an individual's education level affects their income.

The farmer who is educated is likely to be rich. This is confirmed in another study that People get skills from education that help them in problem-solving (Hodge et al., 2015). Sokoya et al., 2014 further say that education helps one acquire information through reading or listening. Hameed & Sawicka, 2016 noted 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 extension service officers. 17% used a participatory approach to train them.

The researcher also examined the relationship between farmers' education level, knowledge of key agricultural program supporters, and understanding of agricultural information. The significant relationship indicated 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, most (76%) consumer stakeholders belong to a farmer group. Former researchers did not mention farmers 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 for the farmer. This form does not have a two-way flow of

information, and the offers do not separate information according to the agro system. (Lawrence & Omuse, 2021).

The greatest focus of extension service is just the information and communication aspect, but the flow is not connected to policies and strategies. (FAO, 2014). This situation creates a big communication gap that mainly affects production. It slows down the farmers' potential for 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 access to agricultural information.

In the current study, 221 respondents (81%) reported receiving agricultural extension services from the County Government of Vihiga and Non-governmental organizations targeting agriculture. Most of these farm 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.

Previous studies found several agricultural extension services were not functioning: lack of accountability and motivation has been the major challenge because they work in different geographical areas far apart. When all the support is given, agriculture productivity will improve, and none or less of this will prove vice versa.

## 5.5. Land Ownership and Food Security Projects.

Land security is essential when conceptualizing successful solutions for food security and projects, as there is a clear association between land security and food security. People and communities with extensive land rights always have better opportunities to support sustainable livelihoods than those without limited rights (Fuente, 2016). The findings in this study show that most farmers had limited access to land as they owned less than 0.5 acres of land; only a few owned more than 2 acres. In addition, most of this land is allocated for setting up a home and compound; thus, less land is allocated for agriculture. These findings align with a study by the Economic Commission for Africa (ECA), which found that constrained access to land reduces agricultural production and, as a result, increases food insecurity in the community (ECA, 2018).

Kehinde et al. (2021) studied the effect of the land tenure system on rice farmers in Northern Nigeria and its impact on food security. They discovered that most rice farmers had limited land to practice rice farming, while others had to rent land to farm their rice. However, production was still low, and they still experienced food security. From the focus group discussions and KIIs, one of the CHVs stated that despite other community members having large pieces of land, they preferred buying food to planting it. This result aligns with the ECA report as one of the major factors affecting food security, especially in most developing countries (ECA, 2018).

The study also revealed that there are various land conflicts among the members of the community. This has highly affected land division, resulting in less land for farming. This was evident during focus group discussions and key informant interviews. The relationship between land size and the project stakeholders' distribution of extension

services was significant at p=0.004. This shows that most programs consider the availability of enough land to support agriculture and maximize production.

## 5.6. 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.

From the findings, it is evident that most farmers, 48.4% (n=132), were not familiar with the existing agricultural and nutrition policies, and 46.5% (n=127) believed that stakeholders were not following any policies geared towards implementing agricultural projects. However, 36.6% agreed that if the policies are well implemented, they could have better project implementation outcomes. Most of the farmers were undecided on the policies that govern food security projects in the community, as the mean score of responses from this section was 2.97.

Most 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 improve food security at large (KII Inter; 1, 2) Table 4.3.* These findings are similar to those of the agricultural policy in Kenya, which focuses on increasing productivity and income growth. It mainly focuses on enhancing 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.

Studies have found that the food security crisis is mostly connected to 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. In this study, 49.8% (n=136) agreed that the stakeholders in place are committed to implementing agriculture policies, while 30.0% (n=82) strongly agreed.

The priorities of agriculture and nutrition programs are misaligned, even though they should be complementary. Although several institutions have been involved in agricultural financing over time, actual investment and agricultural improvement have been insignificant (Alpha & Gebreselassié, 2015). Policies have been established to achieve 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 central economic pillar towards realizing this vision. (Mohamed, 2018).

The Government does not take the implementation of policies seriously. For example, the Maputo Declaration in Mozambique in 2003 stated that all African states should 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. 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 allocated 378.4 million USD to the sector, a decrease from 564.9 million USD in 2021-2022. (Deloitte, 2022)

# CHAPTER SIX

## 6. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS OF THE STUDY

### 6.1. Summary

The chapter focused on the summary of findings analyzed in chapter four. Regarding the study findings, recommendations were made for how these findings would be used to bring up more information about Agriculture and Nutrition Projects, particularly regarding the land size and ownership and education and how they can influence food security projects, proper distribution, and coverage of programs to promote equal and fair support.

### 6.2. Conclusion

Based on the objectives and the findings of the study, the following conclusions can be made: an unlimited size of land was found to be the driver of food security implementation projects in Vihiga County. This finding is consistent with other scholars' support, highlighting the intensity of land size and ownership in securing food problems. 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, an increasing household population led to a high land division. Unequal project distribution was statistically significant in explaining food security project implementation. The respondents overwhelmingly reported that project distribution was just to a minimal extent within the two sub-counties. It can, therefore, be concluded that the farmers were not sufficiently receiving the distributed seeds, fertilizers, and other

value chains because of the bias in how the services were covered. Education was found to be effective in driving food security project implementation. However, education level is not a determinant of farm output as long as the farmers exercise good farming practices in their small lands and benefit from the extension services from extension officers who reach out to them and train them to enhance their farming techniques. Most farmers were unfamiliar with policies supporting food security, but a majority agreed that project outcomes would be better if existing policies were well implemented.

## 6.3. Recommendations

### 6.3.1 Project distribution and coverage.

Through the ministries, the government of Vihiga County should work with the NGOs, farmers, and CHVs to harmonize the distribution and coverage of nutrition and agriculture projects 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 key stakeholders in supporting the achievements of agriculture and nutrition projects within the community.

### 6.3.2. Improve agriculture produce on small land size

The Ministry of Agriculture should support farmers in producing more from their small plots through training in intensive agriculture technology. It should expand markets and market access for farmers, community members, and other vulnerable groups, particularly for marketing nutrient-rich foods obtained through agricultural produce. Moreover, farmers should be educated on how to practice farming more nutritious food

options. Importing food crops is more expensive, and Vihiga County relies on other regions like Nandi for food.

Food security can be improved by increasing production. This will require several measures, such as revamping and improving extension services in the county. Additionally, the study recommends focusing more on agricultural and nutrition-related research. Technology should be used to increase yields on small land.

### 6.3.3. 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 and existing policies

### 6.3.4. Areas of further studies

Based on the findings and the gaps in the study, a replica study is recommended in other sub-counties to test whether this study's conclusions will hold. Another study could be carried out to include other factors that influence the implementation of food security projects, like politics, governance, and cultural factors, which would help improve the project implementation process.

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**APPENDIX I: RESPONDENTS' CONSENT**

Consent form

I……. consent/don't consent to participation in the study being conducted by Elizabeth Sisianoi Kilelo, a post-graduate student pursuing a master's degree in the Department of Nutritional Sciences at Masinde Muliro University of Science and Technology. 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.

**I understand that:**

I. Participation in the study is voluntary and will involve participating in a key informant interview, focus group discussion, and filling questionnaire, which will take less than 15 minutes.

II. The researcher does not foresee any risks to him/her in participating in this study, and it is expected that he/she will experience minimal discomfort or stress from the questions asked.

III. He/she does not have to respond to every question or provide the information he/she does not want to provide, and I understand he/she can withdraw from participating at any time.

IV. Information given will be kept confidential.

V. The researcher will answer any other questions about the research either before or after. If I have any other questions or concerns, I can address them to the researcher by email or phone.

Signature_____ Witness_____

**Researchers Name**: Elizabeth Sisianoi Kilelo **Phone No:** 0706949001

## APPENDIX II: KEY INFORMANT GUIDES

My name is Elizabeth Sisianoi. I am a student from Masinde Muliro University of Science and Technology. I am 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 participating 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 take notes. Any notes, videos, or records taken here will be kept confidential and used only for this study. We will take a maximum of 1 hour. Would you like to participate? Yes: Proceed

| | | |
|---|---|---|
| Stakeholders from (MOA) | I. | What is your general opinion about agriculture, Nutrition, and food security in this country? |
| | II. | Does the county work with other stakeholders at both the government and non-governmental levels 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. | What are some of the food security projects |
| | II. | Which of these programs depends directly or indirectly on agriculture? |
| | III. | What are some of the nutrition program policies |
| | IV. | Do you think agriculture is a solution to improve nutrition? |
| | V. | Do you collaborate with the Ministry of Agriculture, e.g., the agri-nutrition department? |
| | VI. | Are you closely involved in several agricultural programs to add nutrition ideas? |
| | VII. | What are the challenges encountered while implementing the programs in the 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 supported by nutrition at any point? |

| | |
|---|---|
| | VI. Is the Ministry of Health involved in this program ( Nutrition Department)<br>VII. What benefit does the project have to the farmers?<br>VIII. What are the challenges of implementing the project? |
| Stakeholders from civil society | I. Do you have any agricultural projects in this sub-county?<br>II. What are the objectives of the project?<br>III. Is there a link of the project with others from the Agriculture County offices?<br>IV. Do you have specific farmers you work with who can implement the projects?<br>V. How do you select farmers to work with?<br>VI. How does this project support farmers in this sub-county?<br>VII. What are the implementation challenges encountered?<br>VIII. What is your recommendation concerning agriculture in this sub-county? |
| THANK YOU FOR YOUR RESPONSE | |

**APPENDIX III: FOCUSED GROUP DISCUSSION GUIDE (CHVs)**

My name is Elizabeth Sisianoi. I am a student from Masinde Muliro University of Science and Technology. I am 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 participating 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 take notes. Any notes, videos, or records taken here will be kept confidential and used only for this study. We will take a maximum of 1 hour. Would you like to participate? Yes: Proceed

1. How familiar are you with **projects** that support food security in Vihiga County? Mention them
2. How is your community participating in the projects? Probe for more in each program
3. Are the projects' services well **distributed** to the people in your community?
4. What are some of the project's **policies** that you know about?
5. What foods can be produced through agriculture to support food diversity?
6. What challenges do you encounter while supporting your community in Nutrition and health?
7. What can you recommend concerning food security project **distribution, coverage,** and **implementation**?

**Thank you**

## APPENDIX VI: FOCUSED GROUP DISCUSSION GUIDE (FARMERS)

My name is Elizabeth Sisianoi. I am a student from Masinde Muliro University of Science and Technology. I am 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 participating 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 take notes. Any notes, videos, or records taken here will be kept confidential and used only for this study. We will take a maximum of 1 hour. Would you like to participate? Yes: Proceed

1. How familiar are you with **food security projects** that support agriculture? Mention them
2. How is your community participating in the projects?
3. Mention the support in terms of the **value chain** you get from the projects
4. Are the program's services well **distributed** in your community?
5. What are the contributing factors to the status of distribution?
6. How are the food security **policies** being implemented?
7. Do farmers in your community practice **diversified** farming (explain if it is unclear), and probe for more.
8. What are the **challenges** you encounter in the practice of agriculture?
9. What can you recommend concerning agriculture program **distribution, coverage,** and **implementation**?

**THANK YOU**

**APPENDIX V: QUESTIONNAIRE**

I am Elizabeth Sisianoi, studying for a Master's degree at Masinde Muliro University. I am studying Stakeholders' Influence on Food and Nutrition Security projects 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 names. Your participation and cooperation during this vital endeavour are highly appreciated. If you 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 | Which sub-county are you from? | 1. Vihiga Sub County2. Hamisi Sub County |
| Q2 | Record the sex of the respondent | 1=Male<br>2=Female |
| Q3 | Age of the respondent | 1. 18-35 years<br>2. 36-45 years<br>3. 46-55years<br>4. 56 years and above |
| Q4 | What is your marital status? | 1. Married<br>2. Divorced<br>3. Widowed<br>4. Single<br>5. Others |
| Q5 | Occupation | 1. Farmer<br>2. Housewife<br>3. Formal employment<br>4. Casual worker<br>5. Business<br>6. Others specify _____ |
| Q6 | Religion | 1 Christian<br>2. Muslim<br>3. Traditional<br>4. Others |
| **Section 2. Projects Distribution** | | |

| | | |
|---|---|---|
| Q7 | Do you know of any existing agricultural programs? | 1. Yes<br>2. No |
| Q8 | If yes, who supports the program? | Specify …….. |
| Q9 | Are you a beneficiary of any of the programs? | 1. Yes<br>2. No |
| Q10 | If yes, what benefits do you get from the program? | 1. Training<br>2. Fertilizer<br>3. Seeds<br>4. None<br>5. Others specify |
| Q11 | Do you currently belong to a farmers' group? | 1. Yes<br>2. No |
| Q12 | How would you rate the extent of distribution of these projects in the community? | 1. Minimal extent<br>2. Moderate extent<br>3. Great extent |
| **Section 3:Education Level** | | |
| Q13 | | 1. None<br>2. Primary incomplete<br>3. Primary complete<br>4. Vocational (secondary)<br>5. Secondary incomplete<br>6. College (certificate or diploma)<br>7. University<br>8. Others |
| Q14 | Did you study agriculture in either primary or secondary schools are better farmers | 1. Yes<br>2. No |
| Q16 | If yes, did that information make you a better farmer? | 1. Yes<br>2. No |
| Q17 | Do you receive any agricultural extension services? | 1. Yes<br>2. No |
| Q18 | What are the channels of communication used by the extension service providers? | 1. Radio<br>2. Tv<br>3. Mobile text message<br>4. Posters<br>5. Word of mouth<br>6. Others specify |
| Q19 | Have you participated in any agricultural-related training? | 1. Yes<br>2. No |
| Q20 | If yes, what was the training about? | 1. Methods of farming<br>2. Agriculture innovations<br>3. Seeds and fertilizers options<br>4.Others, specify_____ |

| | | |
|---|---|---|
| Q21 | Have you ever received any agricultural information? | 1. Yes<br>2. No |
| Q22 | What method is used in the dissemination of agricultural information? | 1. Train and visit<br>2. Participatory approach<br>3. Farmer field school<br>4. Commodity approach |
| **Section 4: Land Ownership** | | |
| Q23 | What is the size of the land? | 1. ___acres (owned)<br>2. ___ acres (rented)<br>3. ___acres (others)<br>4. None |
| Q24 | What total land acreage is used for farming? _ | _____ Acres |
| Q25 | What crop did you grow in the last one year | Food crops _____ _____ _____<br>Cash crops _____ _____ _____ |
| Q26 | Did you store any food after harvest last year? | 1. yes<br>2. No |
| Q27 | Methods of storage | 1 Granary<br>2 House<br>3. Fridge<br>4. Others, specify |
| Q28 | Methods of preservation | 1. Chemical<br>2. Ash<br>3. Smoking<br>4. None<br>5. Others specify |
| Q29 | Do you always have food for all the members of your household? | 1. Yes<br>2. No |
| Q30 | How long does the harvested food last? | _____ Months |
| Q31 | What are the sources of food in your household (can select more than 1 | 1. Food relief<br>2. Supplies from relatives/friends<br>3. Own farm production<br>4. Buying<br>5. Others specify _____ |
| Q32 | Which one do you consider the most important of the abovementioned ones? _____ | _____ |
| Q33 | Do you have a kitchen garden? | 1. Yes<br>2. No |
| Q34 | . If yes, what are the main types of crops grown? | List them _____ _____ _____ |
| Q35 | Is there importation of food from other regions | 1. Yes |

| | | |
|---|---|---|
| | | 2. No |
| Q36 | What is the most challenging thing in practising agriculture in the country? | 1. Low rainfall<br>2. Reduced land<br>3. Excess rainfall<br>4. poor technology<br>5. Others specify. |
| Q37 | 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<br>3. Increases in food prices<br>4. Others specify |
| Q38 | Do you own livestock? | 1. Yes<br>2. No |
| Q39 | If yes, tick the types ( You can select more than one) | 1. Cattle<br>2. Goats<br>3. Chicken<br>4. Rabbit<br>5. Sheep<br>6. Fish<br>7. Beekeeping<br>8. Others specify_____ |
| Q40 | What products do you often obtain from the livestock? | 1. Milk<br>2. Meat<br>3. Eggs<br>4. Honey<br>5. Others specify _____ |
| Q4 | What are the challenges you have encountered while keeping livestock?<br>_____ | 1. Lack of food<br>2. Diseases and death of livestock<br>3. Time consuming<br>4. Difficulties in doing crop and livestock farming<br>5. Others specify |
| **Observe what is on 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 | |

**Section: 5. Agricultural Program Policies**

| | **Statement** | **Strongly Agree** | **Agree** | **Undecided** | **Disagree** | **Strongly Disagree** |
|---|---|---|---|---|---|---|
| 1 | Familiarity with the existing agricultural and nutrition policies. | | | | | |
| 2 | Agriculture is the main pillar towards the realization of Vision 2030 | | | | | |
| 3 | Stakeholders refer to existing policies during the project implementation process. | | | | | |
| 4 | If existing policies were well implemented, we could have better project outcomes. | | | | | |
| 5 | Stakeholders are committed to developing and implementing the policies to achieve better project outcomes in Vihiga County. | | | | | |

THANK YOU FOR YOUR TIME AND RESPONSE!!!!!!!

## 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 Sisianoi
Masinde Muliro University of Science and Technology
P.O. Box 190-50100
**KAKAMEGA**

Dear Ms. Sisianoi

**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.

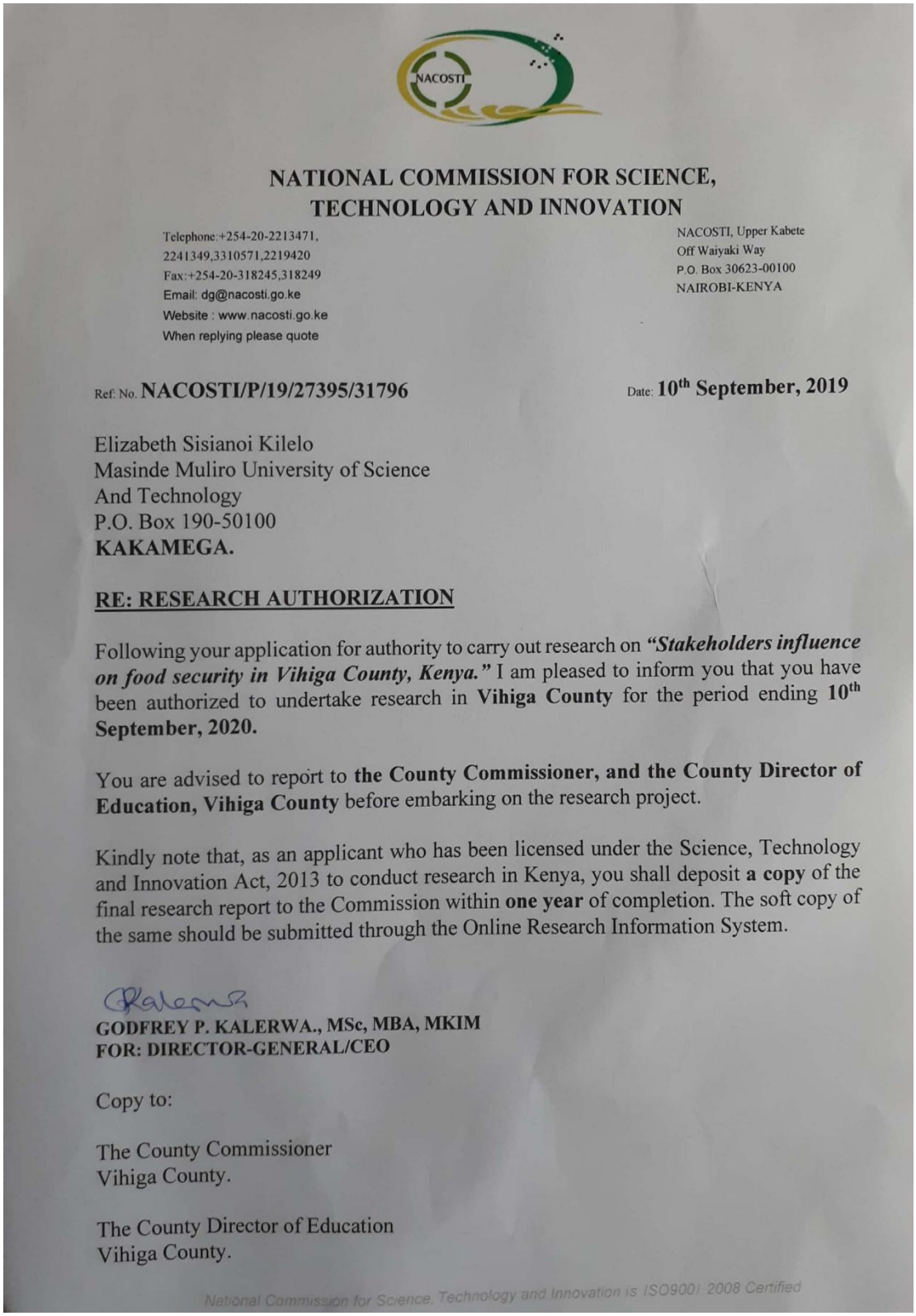
Please note that any unanticipated problems or adverse effects/events resulting from the conduct of this study must be reported to MMUST IERC. Also note that you are required to seek for research permit from **NACOSTI** prior to the initiation of the study.

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**

Telephone:+254-20-2213471,
2241349,3310571,2219420
Fax:+254-20-318245,318249
Email: dg@nacosti.go.ke
Website : www.nacosti.go.ke
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 Sisianoi 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***

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

.....
***Applicant's Signature***

.....
***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 Sisianoi 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

DEPT OF AGRICULTURE, LIVESTOCK, FISHERIES & CO-OPERATIVE
CHIEF OFFICER
20 JUN 2019
P.O. BOX 237-50300
MARAGOLI
VIHIGA COUNTY

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