

**INFLUENCE OF AGRICULTURAL EXTENSION SERVICES UNDER  
DEVOLUTION ON MAIZE PRODUCTION IN KWANZA SUB COUNTY, KENYA**

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**A Thesis Submitted in Partial Fulfillment of the Requirements of the Award of the  
Degree of Master of Science in Agricultural Extension and Rural Development of  
Masinde Muliro University of Science and Technology**

**November, 2025**

**DECLARATION**

This thesis is my original work prepared with no other than the indicated sources and support and has not been presented elsewhere for a degree or any other award

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## **DEDICATION**

I dedicate this work to my family; beloved spouse Beverly, children and my Mum Ruth for their patience, love and overwhelming moral and material support. I also wish to pay my tribute to my late Father Julius Burudi Wekesa, may God rest his soul in eternal peace.

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## ABSTRACT

Devolution aims to increase efficiency in delivery and access to public service. Agriculture was one of the sectors in Kenya to devolve their service provision to the County Governments underscoring the importance of County Governments' role in ensuring food production and improving the rural economy. Despite the availability of modern and advanced farming technologies in food production, food security remains a big challenge in Kenya today. The influence of agricultural extension services under devolution and its effects on maize production in Trans Nzoia County have not been well studied, analyzed and documented since the start of devolution. The purpose of this study was to enhance food production by identifying solutions basing on the influence of agricultural extension services under devolution on maize farmers in Kwanza Sub County, Trans Nzoia County. The objectives of the study were to determine the current status of devolved agricultural extension service provision by the County Government of Trans Nzoia and other stakeholders, to assess the effect of devolved agricultural extension services on maize production in Kwanza Sub County and to identify the challenges of devolved agricultural extension service provision that affect maize production in Kwanza Sub County. The targeted population was the maize farmers in Kwanza Sub County, Trans Nzoia County. Descriptive survey research design was used in the study. This study employed purposive sampling to obtain the key informants from (8) eight public and private agricultural institutions and simple random sampling technique was used to obtain a sample of 379 farmers from a target population of 26767 (maize for food value chain) farmers. An interview guide, a structured and semi structured questionnaire was designed and used to collect information from the farmers and key informants. Descriptive statistics and inferential statistics were used to analyze the data with the aid of SPSS computer programme. Data collected was presented in various formats such as charts, graphs and tables. The study revealed that the current state of agricultural extension services in Kwanza Sub County reflects an established framework but resource constrained network of extension officers. Only 25% of farmers find these services adequate. Partnerships with stakeholders are positively viewed, but the study showed such partnerships are not very evident. The findings indicated a strong dissatisfaction among farmers regarding the effect of agricultural extension services on maize production in Kwanza Sub County. Most of the respondents (70 percent) were opposed to the fact that such services have increased production of maize. The delivery of agricultural extension services is faced by a number of challenges with inadequate funding and insufficient staffing being the two critical ones, 55% of the respondents mentioned that they do not have enough funding of the extension services and 60% of the respondents stated that they have a shortage of extension officers, which impacts the quality of services. There is also the problem of logistics like difficulty in transporting the extension officers and infrastructure gap which limit the availability of the extension officers especially in remote areas. The recommendations that the respondents made included life long learning of the extension officers, technology integration, building stronger partnerships, increasing funding as well as recruiting more extension officers to enhance the effectiveness and coverage of the extension services. The results will guide changes in policies; better extension work and make agricultural development more sustainable. Besides, the research will add to the overall discussion on devolution and rural development and can be used as a reference for future studies and policies that aim to enhance farming and food production in Kenya.

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## **LIST OF ABBREVIATIONS AND ACRONYMS**

<b>ADP</b>	Agricultural Development Programs
<b>ASDP</b>	Agriculture Sector Development Policy
<b>CBK</b>	Central Bank of Kenya
<b>CGIAR</b>	Consortium of International Agricultural Research Centres
<b>CIAT</b>	International Centre for Tropical Agriculture
<b>CIDP</b>	County Integrated Development Plan
<b>CoK</b>	Constitution of Kenya 2010
<b>DAES</b> (Uganda)	Directorate of Agriculture Development Extension Services (Uganda)
<b>GDP</b>	Gross Domestic product
<b>FFS</b>	Farmers' Field Schools
<b>GFSI</b>	Global Food Security Index
<b>KALRO</b>	Kenya Agricultural and Livestock Research Organization
<b>KASEP</b>	Kenya Agricultural Sector Extension Program

<b>KNBS</b>	Kenya National Bureau of Statistics
<b>MAAIF</b>	Ministry of Agriculture Animal Industry & Fisheries (Uganda)
<b>MMADA</b>	Metropolitan Municipal District assemblies (Ghana)
<b>MoA</b>	Ministry of Agriculture
<b>NAD</b>	National Agricultural Data Portal
<b>NAEP</b>	National Agriculture Extension Program
<b>NALEP</b>	National Agriculture Livestock Extension Program
<b>NGO</b>	Non-Governmental Organization
<b>NSA</b>	Non-State Actors
<b>PIM</b>	Policies, Institutions and Markets
<b>T&amp;V</b>	Training & Visit
<b>UN</b>	United Nations

## OPERATIONAL DEFINATION OF TERMS

**Agricultural Extension and Advisory Services:** is a system that facilitates access of farmers or their organizations to new knowledge, information and technologies and promotes interaction with research, education, agribusiness, and other relevant institutions to assist them in developing their own technical, organizational and management skills and practices.

**Devolution/ Decentralization:** transference (as of rights, powers, property, or responsibility) or the surrender of powers and rescaling of responsibilities to local authorities by a central government.

**Food production:** the inputs, process and outputs required to feed a defined population; in the context of this study, it was limited to maize production.

**Food security:** a situation in which all people at all times have physical, social and economic access to safe, sufficient and nutritious food which meets their dietary need and food preferences for active and healthy life.

**Global Food Security Index (GFSI):** Produced annually by Economic Impact and Panel of Experts, is a dynamic, quantitative and qualitative bench marking model that measures the drivers of food security across countries.

**Provision of Agricultural Extension Services:** offering farmers technical information, training and support to enhance their agricultural practices, targeted at enhancing productivity, sustainability and livelihoods within farming communities.

## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.0. Overview**

This chapter provides an overview of background information, statement of the problem, purpose of the study, research objectives, research questions, significance of the study, scope of the study and limitations of the study.

#### **1.1. Background of the Study**

The Kenyan Constitution (2010) made devolution official which means power and resources are now given to county governments. Extension services in agriculture have been assigned to regions. They greatly contribute to increasing the yield of crops and helping to provide food, mainly in regions with serious socio-economic problems (FAO, 2019). Because of devolution, the delivery of agricultural services in Kwana Sub County, Trans Nzoia County is now managed by the local government, who can provide customized support to local farmers. (Constitution of Kenya, 2010).

The area under maize crop in Kenya increased from 2.207 million hectares in 2019 to 2.430 million hectares in 2023. Production also increased from 3.96 million tons (4.40 million – 90 kg bags) in 2019 to 4.3 million tons (4.8 million – 90 kg bags) in 2023. The total value of the maize production increased from Ksh 121.3 billion (2019) to Ksh 180.8

billion (2023). This was attributed to favorable weather conditions, government fertilizer subsidies, and increased investments in the sector by the private sector. (KNBS, 2024).

Agricultural extension and advisory services refer to services and agencies that assist individuals in agriculture to acquire knowledge, skills and technologies to realize improved productivity, food and nutrition security as well-being. Danso-Abbeam et al. (2018) elaborate on the explanation. In most countries, agricultural extension forms a significant component of the developing and transforming agriculture that helps in alleviating poverty in rural areas and securing a higher food supply. When extension services are established and operated in an efficient manner, then farmers may use the information they receive to manage their resources and yield more crop (Evenson and Mwabu, 1998).

Mureithi and Gikonyo (2021) assessed the effect of agricultural extension services in food production and security in various counties. The findings of this study showed that there was a positive correlation between agricultural extension services and the maize production and it was observed that the farmers could achieve high yields and better management techniques due to the information and support they obtained. These findings indicate to us the relevance of useful extension services to increase food security at the national level.

The success of devolution is determined by the success with which the local governments furnish the agricultural extension services when they assume the role of the national government. It has various aspects of service presentation, e.g. the extent of accessibility,

the quality and the availability of extension services to the farmers. This indicates the success of the devolved system in addressing the community in the agricultural sector. The impact of the extension services can be measured by the number of extension officers that are present in all the counties, the way that farmers perceive the services, how frequently they receive the services and the level of co-operation among the stakeholders. The idea of strong devolution is supposed to lead to improved services that would contribute to the improvement of agricultural production of the country and a stable food supply (Mango et al. 2021).

According to the World Food Summit of 1996, Food security means that everyone, at all times, can get enough food that is safe, nutritious and matches their dietary needs and preferences for good health. It describes the general wellness of the farming population. The Global Food Security Index (GFSI) is a useful system that measures the factors affecting food security in different countries (The Economist, 2022). It looks at problems related to how much food costs, how available it is, its quality and safety and how sustainable it is. GFSI points out that farmers need access to resources such as extension services, to improve food security. In this study, food security depends on how well agricultural extension services help farmers produce more and access important resources (FAO, 2019). Looking at maize production and food security in Kwanza Sub County shows how farming and extension services affect the daily lives of farmers.

In September 2015, United Nations (UN) Member States gathered at the institution's headquarters in New York and agreed to take transformative steps to shift the world on to a

sustainable path (SDGs). The SDGs consists of about 169 targets and 17 goals that was approved by about 193 member's states under the umbrella of United Nations. Food security is already considered by the Sustainable Development Goals (SDGs), namely in the goal 2 for zero hunger (Brooks, 2016). It states that the zero hunger covers ways in which counties can end hunger, improve nutrition status of its locals, and develop sustainable agricultural practices. (Abel et al. 2016). County governments are expected to formulate suitable strategies that will fast track some of the SDGs. The institution of devolution was meant to solve local problems facing communities. Devolved governments are expected to develop policies (CoK, 2010), in line with international frameworks and expectations for example the implementation of SDGs. Similarly, Vision 2030 identified agriculture sector as one of the key drivers of the economy in order to sustainably achieve average economic growth rate of 10 percent, reduce poverty levels to 25 percent and boost food security to 30 percent by the year 2030 (Ministry of Agriculture and Livestock development, 2022).

Agricultural extension services challenges are the difficulties that prevent farmers from receiving proper agricultural support and information. Among the factors in this variable are not enough money, not enough extension workers, poor teamwork among partners and logistical problems that prevent people from getting services. Recognizing these problems is necessary to see what the current extension system lacks and to design ways to improve it (Mwamfupe et al. 2019). Solving these problems will help agricultural extension services improve which will result in better productivity and more food security.

It is on this basis that one would investigate the extent to which these services are assisting farmers in Kwanza Sub County and the importance of good policies and teamwork in enhancing agriculture. This study was aimed at enhancing food production through evidence-based pieces of advice that would be based on whether agricultural extension under devolution works with maize farmers in Kwanza Sub County Trans Nzoia County.

## **1.2. Statement of the Problem**

Although the bar of the federal government requires counties to be more food-secure (CoK, 2010), there are still some major barriers that inhibit their effectiveness in assisting farmers and ensuring that maize is produced. Farmers have suffered food insecurity since there are notable loopholes in the provision of services (Mbise, 2016), such as access to modern farming technologies, quality inputs, frequent training and good stakeholder coordination. Policies and strategies in favor of the extension services are in place but their execution lacks uniformity, resulting in the lack of trust towards farmers and the delivery of services in a non-coordinated way (Obare et al. 2021). The farmers of maize are not given the right training and practical advice on modern farming methods, thus food insecurity. According to food security reports, there is restricted access to information and technology that is important in agricultural productivity in remote places. (Gwademba, & Achieng, 2025). These issues highlight the necessity to focus on the intervention to enhance the quality, accessibility, and effectiveness of farming extension services to ensure they achieve their desired purpose of enhancing maize production and food security in Kwanza Subcounty.

### **1.3. Objectives of the study**

#### **1.3.1. General Objective**

This study sought to enhance food production by identifying evidence-based solutions basing on the influence of agricultural extension services under devolution on maize farmers in Kwanza Sub County, Trans Nzoia County.

#### **1.3.2. Specific Objectives**

This study aimed to address the following specific objectives;

- i. To determine the current status of devolved agricultural extension service provision by the County Government of Trans Nzoia and other stakeholders.
- ii. To assess the effect of devolved agricultural extension services on maize production in Kwanza Sub County.
- iii. To identify challenges of devolved agricultural extension service provision that affect maize production in Kwanza Sub County.

#### **1.4. Research questions**

- i. What is the current status of devolved agricultural extension service provision by the County Government of Trans Nzoia and other stakeholders?

- ii. What are the effects of devolved agricultural extension services on maize production in Kwanza Sub County?
- iii. What are the challenges of devolved extension service provision that affect maize production in Kwanza Sub County?

### **1.5. Justification of the study**

Even though agricultural extension services have been devolved under the Fourth Schedule of the Constitution of Kenya 2010, difficulties remain in providing services due to lack of funds, logistics and not enough trained extension officers. Because of this, farmers cannot use new farming technologies, receive financial help or sell their maize which affects maize productivity and food security.

Studies in the past have pointed out that devolution has brought both positive and negative results in agricultural service delivery. Muhumed and Minja (2019) reported that devolution made it easier for farmers in Wajir County to get extension help, farm supplies and financial support which improved their food productivity. In contrast, Mutuga (2018) noted that fish farming productivity went down in Laikipia County because of rising costs, the end of subsidies and fewer extension services. In the same way, Kyambo et al. (2020) found that factors such as gender, education and income levels affected how aware farmers were of devolved agricultural services in Kitui County. These research results suggest that devolution has different results in each county, so further county-specific studies are needed.

Since Trans Nzoia County is different from others in agriculture, climate and economy, this study fills a gap by exploring how devolution has influenced agricultural extension services and maize production in Kwanza Sub County. The results will guide changes in policies; better extension work and make agricultural development more sustainable. Besides, the research will add to the overall discussion on devolution and rural development and can be used as a reference for future studies and policies that aim to enhance farming and food production in Kenya.

#### **1.6. Scope of the study**

This study on the influence of agricultural extension services under devolution on maize production in Kwanza Sub County (consists of both large and small-scale farmers, mixed and cash crop farmers), was conducted between May 2024 and September 2024 (to cover the maize crop season and therefore to maximize on the availability of farmers in their farms), by using descriptive survey research design. The targeted population was the maize farmers in Kwanza Sub County, Trans Nzoia County. Data was collected using questionnaires, interviews and document analysis techniques. This study was limited to maize farmers and maize production in Kwanza Sub County.

#### **1.7. Limitations of the study**

Communication barriers – the Sub County is cosmopolitan hence communication with farmers from different linguistic backgrounds who do not understand English or Kiswahili

proved to be a challenge. However, this challenge was solved by use of interpreters where necessary. This ensured smooth flow of communication during the interviews.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1. Introduction**

This chapter discussed the scholarly contributions previously made so as to guide this study. It particularly focuses on, the role of extension and advisory services in the agricultural sector, an overview of the agricultural sector in Kenya, the concept of devolution and evolution of extension service in Kenya, theoretical literature review, empirical literature review and lastly the conceptual framework.

#### **2.2. Role of Extension and Advisory Services in the Agricultural Sector**

Extension and advisory services for agriculture make it possible for farmers or their organizations to learn new information, technologies and methods. They encourage contact with research, education and business in agriculture to improve skills and methods. It can make the language of technology clear to people in farming, fishing and ranching (Suvedi and Kaplowitz, 2016). The process of agricultural research and development relies heavily on extension and advisory services. They are significant for making changes and encouraging the growth of farming in rural, urban and peri-urban areas by means of small-scale farming. Agricultural extension is an important way for countries to develop their agriculture, lower rural poverty and ensure their people have enough food.

Extension and advisory services help producers and others in the value chain deal with important issues in the agriculture sector. Such changes involve quick changes in the global, regional and local food and agriculture systems, rising non-farm jobs in rural areas, reduced natural resources, climate changes and problems due to various health issues. Those who work in farming and producers are especially at risk from weather-related disasters which are also made worse by changes in the market, poor government, conflicts and diseases. Through extension and advisory services, rural and farming households may gain access to important agricultural knowledge and skills which can make them stronger. Also, agricultural extension helps find and examine the issues faced by small-scale farmers, so that suitable strategies and policies can be developed and implemented within the value chain. (Kenya Agricultural Sector Extension Policy, 2022).

The United States created the Cooperative Extension Service in 1914. A partnership exists between the county, state and federal governments. The extension service helps farmers, fishers, forest land owners and home makers by teaching them new or improved ways to do things that were discovered in the land-grant universities. (Agwu et al. 2023)

According to Agwu et al. (2023), The public extension organization in Nigeria started operating in 1968 which was supervised by the Ministry of Agriculture (MOA). Enclave arrangement was used to initiate the Agricultural Development Projects (ADPs) strategy in Funtua, Ayangba, Ekiti-koko, Gombe, Gusau and Lafi towns in 1975. This arrangement worked well, ADP strategy was introduced in all the states in Nigeria. Since the year 1989, public sector extension in Nigeria has mainly focused on the Agricultural Development

programs (ADPs). The ADP was created to make production and productivity better by giving farmers proven technologies, helping with their supplies and offering rural infrastructure. Consequently, the program makes use of the training and visit (T & V) system to offer complete agricultural extension help for crops, livestock and more under a single command.

Uganda's current extension and advisory service system includes both public and private actors according to MAAIF (2019) and NAEP (2016). Part of the MAAIF public sector are the DAES, local government public structures, technical directorates, agencies and non-state actors (NSAs). The DAES takes charge of leading, managing and coordinating all extension advisory services at the national level. DAES cooperates with the departments that look after animal resources, crop resources, fisheries resources and commodity agencies (for example, Uganda Coffee Development Authority, Cotton Development Authority and Dairy Development Authority). The departments and agencies provide technical details that are then organized and shared by the Directorate of Agricultural Extension Services to both extension workers and farmers. The formation of commodity value chains is the responsibility of the technical directorates. They plan what services are needed for producers at different stages of production; and partner with DAES to ensure these groups get the right services. In local areas, the staff at district and sub county levels are responsible for carrying out agricultural extension. Officers at the district level organize the different extension services and get technical guidance from the MAAIF DAES. In policy advocacy for extension services, resource gathering and capacity

building, non-state actors are very active. Besides, Uganda National Farmers' Federation, Ministry of Trade, Industry and Cooperatives, Ministry of Water and Environment and Ministry of Gender, Labor and Social Development are also important institutions in agricultural extension at the national level. Training and development for agricultural extension and research institutions is available at universities, colleges and training institutions. (Agwu et al. 2023)

### **2.3. Overview of the Agriculture Sector in Kenya**

Agriculture is very important to Kenya, as it makes up 23% of the country's GDP and another 27% indirectly through its links with manufacturing and service businesses (KNBS Economic Survey, 2021). Kenya's agricultural sector is important because it gives employment to over 40 per cent of the population and 70 per cent of rural residents and it ensures a livelihood for almost 80 per cent of the people (Agricultural Sector Transformation and Growth Strategy, 2019-2029). Both small, medium and large farms are part of Kenyan agriculture and more than three-quarters of the country's farm production comes from small farmers. Most of the farming is done through water fed by rain. It is estimated that 7 percent of the land is irrigated. Most of Kenya's high to medium potential areas which are watered by more than 1,200mm of rain each year, grow a broad variety of crops, for example, tea, coffee, sugarcane, maize, wheat, potatoes, fruits and vegetables (World Bank, 2018).

Kenya's agriculture is made up of a large number of small-scale producers such as farmers, fishers and herders and only a small number of large-scale producers. The census in 2019 counted 6.4 million farming households, including 1.7 million crop farmers, 3.9 million mixed farming, 760,000 Livestock farmers and about 30,000 fisher folks (Kenya Population and Housing Census, 2019). The small-scale sector makes up 75% of all agricultural production and about 70% of what is sold in the market. The main activities of big producers are cash crops, commercial livestock and commercial fish farming. Because they use more resources and better techniques, these producers achieve higher outcomes for their businesses. All these points about the agricultural sector guide the way both public and private extension services are created and structured.

According to the economic survey of 2022, there was a slowdown in the growth of the agriculture sector from 5.2% in 2020 to 0.1% in 2021 due to bad weather that reduced crop and livestock performance. Maize production went down from 42.1 million bags in 2020 to 36.7 million bags in 2021 mostly due to poor weather in 2021. Also, the production of beans dropped by 14.0 per cent, reaching 7.4 million bags in 2021 and the production of millet and sorghum went down by 58.8 per cent and 57.1 per cent respectively to 0.7 million bags and 1.5 million bags in 2021. Still, the production of potatoes rose by 10.5 per cent to reach 2.1 million tones. The industry shrank by 0.7 percent in the first quarter, by 1.4 percent in the second and by 0.6 percent in the third quarter of 2022 (Central Bank of Kenya, 2023).

All in all, the sales of produce from large and small farms went up by 3.4%, reaching KSh 527.0 billion in 2021. Marketed agricultural produce is largely contributed by the smallholder sector which is responsible for 73.1%. Sales for small farms went up by 3.1% from KSh 373.6 billion in 2020 to KSh 385.3 billion in 2021. There was a 4.2% increase in sales from large farms when compared to KSh 136.1 billion in 2020, reaching KSh 141.8 billion in 2021. The value of things purchased by companies went up from KSh 69.3 billion in 2020 to KSh 77.5 billion in 2021 which is an increase of 11.8 per cent. The amount of fertilizer purchased went up by 26.4 per cent to KSh 20.5 billion in 2021. Value of manufactured feeds grew by 24.5 per cent to reach KSh 12.3 billion during the year under review. The amount of fuel and power used in agriculture dropped by 3.4 per cent, reaching KSh 16.6 billion and certified seed value fell to KSh 4,170 million in the period studied. (KNBS Economic Survey, 2022).

#### **2.4. The Concept of Devolution and Evolution of Extension Service in Kenya**

In the year 2010, the new constitution was promulgated in Kenya which set up a system with one national government and forty-seven (47) County Governments. The main purpose of this change was to help people access public services and take part in making decisions and developing their communities through devolution (Constitution of Kenya, 2010).

Devolution happens when certain tasks, duties, resources and powers are handed over to local governments. This means that political, administrative and financial power is divided among different territories. Giving power to local regions can help states support their own

interests since local accountability is improved. It offers numerous ways to govern correctly since it follows what the locals consider most important. It is important to be responsible since this is where authorities and those, they govern work together closely. The people can use their voting power effectively on local governments which leads leaders to work harder since they are part of the local population. Ensuring food security and helping the rural economy by providing agricultural services was one of the first responsibilities given to county governments (Constitution of Kenya, 2010).

Kenya started working on agricultural extension in the early 1900s. At the time of colonization, the extension programs were made to support the farming businesses of settlers and were mostly focused on commodities. They consisted of combined extension services, loans and free inputs to help farmers produce for particular markets. The extension services offered to indigenous Africans were mostly forced which made them unpopular. In 1954, the Swynnerton plan suggested that African farmers should grow cash crops, raise dairy animals and receive more technical help as well as access to all marketing services.

The main achievements in extension were spreading hybrid maize technology, promoting artificial insemination and cooperative action, launching farmer and pastoralist training centers, using a whole farm extension method and implementing the integrated agricultural development approach. Between the 1980s and 1990s, the extension methods focused on farming systems, training and visits. Besides these, the ‘commodity specialized approach’ was mostly adopted in the large export commodity sector under the leadership of

commodity boards and private companies. The extension policy for the agricultural sector in Kenya was created in 2022. Less money and fewer extension staff had a negative influence on the public extension service. Public extension services require a lot of workforce, time and funds. People have thought that public extension is managed from above, does not adapt and relies on a single approach which makes it difficult to respond to new problems in farming. The Government and other stakeholders have in recent years started using more participatory and demand-driven methods for extension work (Kenya Agricultural Sector Extension Policy, 2022).

Because of these issues, the Ministry of Agriculture and Rural Development made the National Agricultural Extension Policy (NAEP) in 2001 to help improve extension services. The NAEP realized that making the extension system more diverse, decentralized and stronger would make it more sustainable and useful for farmers. The NAEP was set up to guide all government work in extension and its cooperation with other players in agricultural research and development. These were made to include farmers and private businesses in providing extension services. Among the ways the policy was put into practice was through the National Agriculture and Livestock Extension Programme (NALEP), the focal area approach, farmer field schools (FFS), value chain approach and demand-driven approach. These are some of the approaches that helped farmers take part in agriculture (Ministry of Agriculture and Rural Development, 2022).

Following NAEP, the National Agricultural Sector Extension Policy 2012 was put in place which changed the method for providing extension services to a sector-wide approach. It

helped service providers and other stakeholders understand the guidelines for behavior and teamwork and it showed all parties how to improve their coordination and teamwork. The policy led to the creation of the Agriculture Sector Development Support Programme (ASDSP) which took over from NALEP and started its work in 2013 when devolution began. The program mainly aims to turn crop, livestock and fisheries production into businesses that help achieve sustainable food and nutrition security by improving the skills of different actors along the priority value chains.

The new constitution in 2010, created a system where Government powers were shared and agriculture was included among those powers. In accordance with the Fourth schedule of the Constitution, the county governments carry out the national government's policies as they relate to the county and are especially responsible for crop and animal husbandry, livestock markets, abattoirs, diseases among plants and animals and fisheries. Both the national and county governments should establish and enforce policies and measures that boost and support agriculture in the country. According to Part 2 of Fourth Schedule, each county government was charged with issues concerning agriculture. In line with Part 1 of section 29 of the Fourth Schedule, the national government developed agricultural policies and helped the county governments with related matters. For the sake of consistency and national rules in the agricultural sector, every county government should carry out its legislations and administrative duties based on national policy guidelines (Constitution of Kenya, 2010)

Currently in Kenya there are three main sources of agricultural extension services, first is the public sector (The National and County Governments through Ministries, Departments and Research Centres). Secondly the private non-profit sector (local and international non-governmental organizations - NGOs, foundations, community boards and associations, bilateral and multilateral aid projects and other non-commercial associations). Lastly the private for profit sector (commercial companies e.g. input manufacturers and distributors, commercial farmer groups' enterprises where farmers are both users and providers of agricultural information, agro processing firms, trade associations and private consulting and media companies). (Ministry of Agriculture and Livestock Development, 2025).

#### **2.4.1 Maize Production in Trans Nzoia County and Kwanza Sub County under Devolution**

Agricultural extension services are devolved in various African countries to improve food security and rural livelihoods. In South Africa extension services have a significant impact on maize production particularly among smallholder farmers. Farmers who receive extension services are more likely to adopt climate smart agricultural practices, leading to improved yields and productivity. (Boakye, 2023). Although some farmers perceive public extension services as ineffective, citing issues with relevance, quality and accessibility. Extension services also face resource constraints including limited funding, inadequate infrastructure and insufficient personnel (Chimoyo et al. (2017). In Malawi maize farmers with access to extension services have an average technical efficiency of 63 percent, indicating potential for a 37 percent increase in maize output using the same level of

inputs. (Ragasa et al. 2018). However, extension services also face resources limitations affecting their effectiveness.

Maize is one of the major staple crops that could be cultivated as a result of subsistence and commercial harvesting in Trans Nzoia County. Maize is grown within all the agro ecological zones as well as the length and breadth of the county. In 2019, the maize production area was 106549 hectares which had a projected production of 426499 tons and in 2023 the production was 126065 hectares and projected production of 448011 tons. (Ministry of Agriculture, 2024). More than 80 percent of the population is occupied in the manufacturing of maize that adds to food security and nutrition. Traditionally, maize is planted once in a year, in the Trans Nzoia County, using the long rains, but as weather patterns change and become more erratic, the trend of planting maize twice in a year is becoming popular. (KNBS, 2024).

The climate risk profile of Trans Nzoia County report (Ministry of Agriculture, 2021) states that the Maize farmers in the Trans Nzoia County are categorized into large, medium, and small-scale farmers based on the extent of land under production. The participation of women and youths in the production activities on farm is high and that of the men is low There are organized markets in the maize value chain which include the millers and government agencies like the NCPB. These organized markets are unlike the local traders and markets that give farmers a market where they can dispose their produce at stable prices. Retail and wholesale traders selling maize in trading centers make up of the non-structured markets. The price takers are maize farmers in Trans Nzoia since they do not have a bargaining position. Market forces of supply and demand decide on the prices. Farmers have an identical planting and harvesting period, which makes them have gluts in the market hence low prices of their produce. Trans Nzoia County is the grain basket of Kenya and is subject to numerous challenges. It has also been facing decreasing land productivity over the years as a result of acidification due to its continuous use of basic fertilizers like the diammonium phosphate. This scenario has led to the low

production of the traditional crops that have been produced in the county like maize and beans. The extension services are under capacity and the institutional policies have made the extension services more demand oriented and this has eclipsed the services an extension service provides. In the past, extension officers used to visit farmers uninvited, however, farmers are today required to invite the extension agents to visit them, and this is not possible hence, the decline in productivity. Low adoption rates of technologies have been caused by weak extension linkages which has been further compounded by high cost of the technology and the shortage of financial resources that farmers have. High production costs have been as a result of high topography of technologies and high input costs. This has been worsened by the lack of access to cheap credit facilities which has made this issue become a vicious cycle since every planting season is marked with delays in seed supplies and shortage of fertilisers. The weather situation has been exacerbated by vagaries of the weather because seasonality change, increased dry spells, and excess rainfall have had negative impacts on agricultural production. The fact that there is poor road infrastructure has also contributed to high losses amongst farmers as they are unable to deliver their produce to the markets in time and the supplies of inputs cannot arrive in good time. This has compelled farmers to sell their raw produce due to little or no value addition to the produce, and the lack of storage and processing facilities. Produce that has undergone value addition will sell at high prices as compared to raw products. The situation has led to a reduction of prices paid to farmers because majority of their products have low shelf-life hence farmers are price takers. (CIAT, 2018).

Kwanza sub county is multicultural. It also has the greatest area of land that is being used in cash crop production in Trans Nzoia County. Moreover, the Sub County boasts of the greatest forest cover in the county that hosts Suam, Kimothon and Kiptogot Forests. Most of the inhabitants engage in both growing crops and rearing of animals. The Sub County is blessed with natural conditions that are favourable to the cultivation of various crops including food crops (maize, beans, potatoes, millet, bananas and wheat), industrial crops (coffee, tea) as well as a wide variety of horticultural crops such as tomatoes, cabbages, kales, avocados, oranges and mangoes. The percentage of land that is privately owned is significantly large in terms of leasehold and freehold ownership. In Freehold, one receives the absolute right to the land as long as one lives whereas in leasehold, the right is recognized over a certain duration after which a fee is paid. The mean size of farms is 4.7 hectares. The size of a farm is in the range of 0.8 hectares of a small scale farm to 22.6 hectares of a large scale farm. Trans Nzoia County Integrated Development Plan, 2018-2022.

The average amount of rainfall on Kwanza Sub County is 1,200 to 1,300mm/year. The yearly rainfall is divided into three large seasons, that is; long rainfall season- March, April, May (MAM), Intermediate Season- June-July-August (JJA); and short rainfall season- October-November-December (OND). Agricultural production in the long and intermediate seasons is more reliable than that of short rainfall season. It is situated at the altitudes of 1,700-2,000 metres above the sea level. The Sub County has a cool and temperate climatic condition with the mean maximum (day time) temperatures ranging

between 23.4 degrees Celsius and 28.4 degrees Celsius and the mean minimum (night time) temperatures ranging between 11.00 degrees Celsius and 13.5 degrees Celsius. The highest and lowest extreme temperature is recorded in February (approximately 34.2 degrees Celsius) and January (approximately 6.50 degrees Celsius) respectively. It is located between an altitude of 1, 700 and 2,000 metres above sea level. It is located between latitudes 00 52 -1 and 10 18 -1 north of the equator and an equal number of longitudes 340 -38 o and 350 -23 o west of the Great Meridian. The basement complex contains well drained deep red and brown clays as well as sandy clays that cover the Sub County. (Trans Nzoia County Integrated Development Plan, 2018-2022).

## **2.5 Theoretical Framework**

This study was guided by the Souffle Theory of Decentralization and the Four Pillars of Food Security Theory.

### **2.5.1 Souffle Theory of Decentralization**

The Souffle Theory of Decentralization, proposed by Parker (1995), serves as a foundational framework for understanding the dynamics of decentralization in the context of agricultural extension services. It is proposed that decentralization is mainly about how administration is handled and that each aspect of it can affect how well it works. He compares the progress of decentralization to making a souffle which requires just the right amount of milk, eggs and heat to work properly. In this example, the ingredients stand for the main parts of decentralization: political, fiscal and institutional elements. If

decentralization is to help rural areas, these elements have to be integrated well (Farooq et al. 2008; Laryea-Adjei, 2006).

The Souffle Theory stands out because it understands that decentralization has many aspects. By pointing out that decentralization works differently in every situation, the theory helps us see the many factors that can affect its outcomes. In agricultural extension services, the relationship between politics, budget and organizational ability can greatly shape the way services are offered. Moreover, the metaphor from cooking makes it easier for the theory to be understood by policymakers, practitioners and members of the community.

Still, there are some issues with the Souffle Theory. A disadvantage is that it may make the process of decentralization look simpler than it is. The example of a souffle is probably not enough to explain the many unexpected and multifaceted problems that can occur when putting decentralized policies into practice. For instance, political problems, cultural differences and different levels of community involvement can all cause decentralization to fail. The theory mainly deals with administrative matters of decentralization which might not consider important issues such as social fairness, citizen participation and the activities of non-governmental groups in providing services.

Within this study, the Souffle Theory gives useful information about the aspects of devolution that are being studied, especially with regard to agricultural extension services in Kwanza Sub County. The theory points out that matching political, fiscal and

institutional structures is important for better service delivery and food security. As an example, the study can use the theory to determine how the shift in agricultural services was affected by the decisions of county leaders, the amount of funding and the ability of local institutions to handle such policies.

The study employs the Souffle Theory to determine the weaknesses and strengths of the existing decentralization system in Trans Nzoia County, determine the level of effectiveness of agricultural extension services and recommend on the methods of improving them. It indicates that the decentralization approach that is well-organized must put into consideration the factors that are interrelated and that contribute to realizable improvements in agriculture and a more secure food supply.

### **2.5.2. The Four Pillars of Food Security Theory**

FAO of the United Nations has developed the Four Pillars of Food Security Theory that gives a detailed explanation of food security (FAO, 2020). It presents four major areas that are availability, access, utilization and stability. Each of the pillars helps to compute food security in a specific area and the associations must actualize the key influences on it (FAO et al. 2019). This theory may be used in the Kwanza Sub County that uses the maize as source of food security in the Trans Nzoia County.

The main strength of the Four Pillars of Food Security Theory lies in the fact that it considers a range of different factors. Availability is the physical access of food due to its production, its distribution and supply channel. Access refers to the money and material

assets of individuals and groups that is used to get food, their earnings and amenities they have. Utilization involves the food preparation, food habits and nutritional value whereas stability is the ability of the said variables to remain the same over time although an incidence of change of the economy or disaster may occur (Food Security Cluster Handbook). The major focusing on the cultivation of maize in the Kwanza Sub County demonstrates the importance of this theory in the analysis of the extension services and their contributions to the local food security.

Its key strength is that it has a detailed structure that assists in examining various forces that influence food security. Examining all the four angles, the theory provides an effective means of measuring the effectiveness of agricultural extension services. It also highlights the relation between the pillars, such that by improving on an area, other areas can also be improved. With markets being more accessible, individuals will be able to acquire more food and use it to better purposes which aids in maintaining things steady.

The theory is more useful because it can be used in the real life. Since it can be applicable in most cases, it should be used in testing food security in various areas like agricultural societies like Kwanza Sub County. The Four Pillars framework assists extension services to come up with programs and rules that can promote food security and raise the agricultural production.

Although it is of use, there are weaknesses in Four Pillars of Food Security Theory. It is a common experience to struggle to define the extent of influence of a given factor on food

security owing to the fact that the pillars are interwoven to a large extent. Such an emphasis on the fundamentals of such interactions may overlook such significant details of local agriculture and economic situation as would be required in a complete picture of food security. More so, the usefulness of the theory is determined by the extent of data provided. In order to be able to judge each of the pillars, the data should be reliable, though in certain developing areas, such data might not be easily accessible. Due to this, this theory is at times difficult to practice (Webb et al. 2006).

It is necessary to mention that food security is subject to change. The external factors that influence the food security are climate change, the transformation of the economy and political matters. The theory may not be in a position to explain how these factors change very fast hence the need to continuously update food security plans.

The Four Pillars Theory can be applied in real life in a variety of ways. First, it assists in assessing the Kwanza Sub County agricultural extension services by assessing their effectiveness regarding the promotion of the key points of food security. Through such analysis, it is possible to identify the issues with the delivery of the services and devise solutions such as educating farmers on new ways of farming or assisting them in going to the markets.

Second, the information that the study will reveal will inform policymakers in formulating measures that would ensure each of the four pillars is strengthened (World Bank, 2018).

Priorities on the areas which need implementation help in utilization of resources more efficiently and result in improved maize production and food security within the region.

Also, the theory provides an effective framework to test and quantify food security initiatives. Constant review of every pillar enables the stakeholders to observe the progress they have made thus, enable them to rectify their strategies when new hurdles emerge.

Finally, community involvement is significant in the Four Pillars model, and it demonstrates that local community participation in food security initiatives is necessary. When farmers are involved in decision making process, extension programs will become more effective and accomplish greater food security.

Finally, the Four Pillars of Food Security Theory is a good means of analyzing the food security in Kwanza Sub County. With the help of this theory to analyze the agricultural extension services, the study will be able to identify the strengths and weaknesses of the existing approaches. Once the key concepts of the theory and their implementation into reality are properly comprehended, it can significantly enhance the work of agricultural policies and programs, decrease hunger and increase maize production. This kind of review evidences that the Four Pillars are significant and such interventions can assist farmers and their communities considerably.

## **2.6 Empirical Literature Review**

### **2.6.1 The Current Status of Devolved Agricultural Extension Service Provision**

In a study that was conducted by Klerkx and Leeuwis (2008), it was researched how agricultural extension services in the Netherlands function. They indicated that effective relationship is enhanced between the public and the private parties and when there is good cooperation among the stakeholders which leads to success of agricultural extension services. The research discovered that amongst the most effective is the extension services which are locally endorsed and supported by information easily accessible to the farmers. Such services are enhanced and more receptive with the help of the local knowledge and addressing specific challenges in agriculture. Nevertheless, the paper has found that the spillover of the political structure to the delivery of the extension services in different settings has limited extension of attention. It is based on this that we cannot clearly state the influence of the structures of governance and policies on the success of the extension services.

Adebayo and Ngeve (2017) chose to use both quantitative and qualitative research to examine the topic of agricultural extension services in Nigeria. The researchers engaged in survey of farmers and interviewing of extension officers to have all the information required regarding service delivery. It was also found out that the agricultural extension services were not satisfactory because it lacked adequate funds besides being lacking in trained individuals. The farmers demanded to receive additional help that will solve their

particular problems, including crop disease, pest and biological-friendly farming. It implies that extension workers ought to be well trained and provided with the necessary resources to be effective. Nevertheless, the role played by local government arrangements in the provision of extension services is not well studied. With the knowledge of these variables, we might be able to develop better policies in order to help the extension system in Nigeria.

Mbilinyi and Mwamfupe (2019) carried out a research study in Tanzania at regional levels. In accordance with the results, the extension services of agriculture were offered in various areas, but their effectiveness was not the same as it was caused by the unequal distribution of resources and state support. The reason was that there were few regions which had access to good and consistent extension services and others could not. It shows that there is a necessity to have the balanced distribution of resources and focus on the areas which are far behind in terms of performance. The paper has not explicitly studied the links that exist between the cooperation of stakeholders and the delivery of the service in other regions. The studies on the ability of different stakeholders to cooperate and develop the state of agricultural extension services would help to improve the performance in this sphere.

Ngigi and Ndung'u (2020) studied how agricultural extension services were provided in various counties in Kenya. Many farmers were found to be able to use extension services, but the researchers discovered that their quality and reliability were often not good. Among the reasons for this inadequacy were not enough staff and money for extension programs. It was found that although there is a framework for agricultural extension, the way it is

applied is unstable which causes weaknesses in services. Because the support offered through extension services is not always reliable, farmers are less able to make good use of it. In addition, the research mainly looked at the availability of services, but it did not examine the part that various stakeholders play in delivering extension services. Understanding the contributions of various stakeholders, including local government, NGOs, and community organizations, could provide a more comprehensive view of how to strengthen agricultural extension services in Kenya. Therefore, it would be important to carry out similar studies in other counties; hence, the need for this study. These studies present a knowledge gap. The gap exists as devolution of any ministry/power to lower tiers of government allows the government representatives to tailor the devolved function to their specific needs. Hence how agriculture is devolved in other Counties and its effects, cannot be expounded and applied to any other county, since their findings cannot be generalized and applied to Trans Nzoia County due to differences in climate, culture, geology, economy, and policies and hence a need for this study.

### **2.6.2 The Effect of Devolved Agricultural Extension Services on Food Production**

Benin and Wodon (2018) published a significant study titled "The Role of Agricultural Extension Services in Food Security: A Review of Literature and Evidence." This research aimed to systematically analyze existing literature and empirical evidence regarding the impact of agricultural extension services on food security. The authors were able to use a meta-analysis approach to combine findings of numerous studies carried out in different areas, thereby comparing the qualitative and quantitative finding in-depth. The study

demonstrated that more food security and high productivity require strong agricultural extension services. Sharing knowledge, transferring and providing training to farmers were important aspects of this process. The authors discovered that locations that had good extension services tended to yield higher and have better food security meaning that farmers require a good support.

The research by Kamara and Savadogo (2020) was conducted in the West African region through focus group discussions with farmers and the extension officers. The strategy contributed to unveiling the perceptions and experiences of the stakeholders of the agricultural extension services. They discovered that extension services assisted individuals to become food secure as it made them learn and utilize the needed means and methods of farming effortlessly. Nevertheless, the paper has indicated that in cases where services are lacked in reliability, their performance is diminished implying that even available extension services may not be that effective as they can be due to logistical and coordination issues. It was discovered that little information exists regarding the precise effect additional services on various agricultural products have. Researching this topic may enhance our understanding of the real benefits that people receive due to agricultural extension services.

A time series study was employed in a study by Abate (2022) to examine the impact of agricultural extension services on the extent to which smallholders farmers in Ethiopia produce food. In this way, the author managed to follow the tendencies in time and to receive some valuable lessons concerning an impact of extension services on agriculture.

The experiment revealed that agricultural extension services result in increased food production, which is mainly in crops such as maize and beans. Farmers that engage extension services enjoyed improved food security that is an indicator that the services are relevant in enhancing and maintaining agriculture. Nevertheless, the research was predominantly focused on the aspect of crop production and was not on the impacts of markets and economy on food security. It demonstrates that the aspects of economics should be considered in future studies to provide a more comprehensive view of the food security issues of farmers.

Omamo and Collins (2023) gathered information by both gathering the statistics of agriculture and conducting the interviews with farmers scattered all across the globe in Tanzania. Within this research methodology, the researchers obtained the information about the impact of agricultural extension services on the food production and security in detail. It was found that the food production and security of the farmers was also improved when they received effective extension services. With the help of the extension officers, the farmers argued that they were able to do more and use resources in a more effective way in their farms. It demonstrates the importance of the existence of extension services, which are specific to the requirements of a community. Nevertheless, the study failed to explore the impact of various extension services to the local communities in other economic and social settings. This shows that more research is required to establish how the success of the agricultural extension projects can be different across the communities.

The research study conducted by Omamo and Collins (2023) in 2021 used the cross-sectional survey design to test a correlation between agricultural extension services and food production and security in part of Kenya. They found out that there existed a rise of improved maize production and farm management enhancement of their farms as a result of information and advice that farmers obtained as a consequence of farm extension. They underline the importance of food security serving in the nation by the extension services. However, despite the positive correlation in the research, it failed to elaborate on the actual perceptions that were held about the extension services of other groups of farmers. These views should be identified in an attempt to provide high quality services to farmers and in seeing to it that the overall farming society is offered value resources.

### **2.6.3 Challenges of Devolved Extension Service Provision**

Swanson and Rajalahti (2020) in their study, *Strengthening Agricultural Extension and Advisory Services*, reviewed agricultural extension systems in the world with a focus on the issues they face. The researchers collected data based on case study, surveys and interviews with the extension experts and farmers. It was determined that there are a number of issues with extension services which include lack of finances, inadequate access to information and technology, lack of enough training to employees and ineffective connection between research and extension work. The article identified that it is hard to assist disadvantaged populations, such as smallholder farmers and women. Another point that the authors made is that the information about the outcomes of the extension services

within every culture is insufficient which implies that the adaptation of approaches to the local circumstances is required.

The paper was titled *Assessing the Challenges of Agricultural Extension Services in Italy*, which was prepared by Mazzucato and Boccella (2018). They also used both the survey of the extension agents and the farmers and qualitative interviews to examine the effect of extension services in Italy. It was established that shortcomings were associated with slow bureaucracy, lack of collaboration between various agriculture departments and lack of assistance to small farmers. The report also indicated that increased population of older individuals in the agricultural extension decreased the quality of services. The authors mentioned that additional research, which should be conducted to determine the role of digital technologies in offering extension services and lack of data concerning how the needs of various agricultural stakeholders could be better addressed.

Kivuva (2017) used data of both extension workers and farms in Eastern and Southern Africa. The research involved both interviews and data analysis to identify the extent to which the extension services are effective and to uncover the primary problems of these services. The research indicated that the extension work lacks sufficient funds, the rate of employees who are leaving is too high, agents have limited opportunities to be trained and the infrastructure is inadequate. The authors also indicated that extension services do not always cater to the needs of the local farmers especially when the agriculture in these regions is rapidly changing. The results of Kivuva came in handy though they also

indicated that, additional research was necessary in order to learn the issues women and young people face in their efforts to access extension services.

In their article titled *Nudging Farmers to Use Fertilizer*, Duflo et al. (2021) have analyzed the hindrances to effective agricultural extension services. The researchers conducted the study in Kenya by conducting a randomized trial and gauging behaviour using surveys and observation to determine whether nudges enhanced the manner in which farmers applied fertilizers. The extension services were found to have big problems since there was mistrust between farmers and agents, insufficiency of resources and lack of knowledge regarding local farming. The easy behavior change, as per the findings, has the potential to make farmers more interested in extension services. Despite this, research on the use of fertilizers was the main focus of the authors who forgot other crucial issues on agricultural extension services particularly concerning other types of crops.

All these studies point to the myriads of issues that accompany the delivery of agricultural extension services in different contexts. Due to the insufficient financing, the absence of the proper collaboration with research and the absence of the special approaches to local conditions, there are numerous gaps. These challenges should be addressed to make the extension services effective and make farming in the world more productive and reliable.

#### **2.6.4 Influence of Devolved Extension Services on Food Production**

The devolution has had a significant impact on the manner in which agricultural extension services are delivered in various parts of the world. Anderson (2007) conducted a meta-analysis of extension services in decentralized form in India, China and Brazil in the

background paper of World Development Report 2008. He found that the devolution to a considerable extent made things more efficient and allowed farmers to play a role in the decision making process. However, the program had such problems as insufficiency of finances, insufficient coordination and monitoring which reduced its effectiveness. The other finding in the study was that partnering with the private companies may increase the quality of services. However, the paper failed to exhaustively touch the effects of various political and economic environment on the devolved agricultural services as well as fail to scrutinize the rural regions separately.

Kassa (2020) studied how decentralization affects agricultural service delivery in Ethiopia and conducted interviews on agricultural extension workers and the local government using the interviews. The study showed that where the agricultural programs were coordinated by the local governments, the programs were well placed to address the needs of farmers in respective geographical areas. But scarcity of resources of local governments, low training of the extension officers and the political influence played a significant role in reducing the effectiveness of services delivery. This information was largely derived using the extension workers and the real farmers who actually consume the services were not factored in. Moreover, it did not evaluate the decentralization impact on food security in the long-term and productivity.

Msuya and Nandonde (2020) had both surveys and interviews with extension officers and farmers as their research methods in an attempt to find out the effect of decentralization in Tanzania. Their data was observed to show that decentralization contributed to the ease of

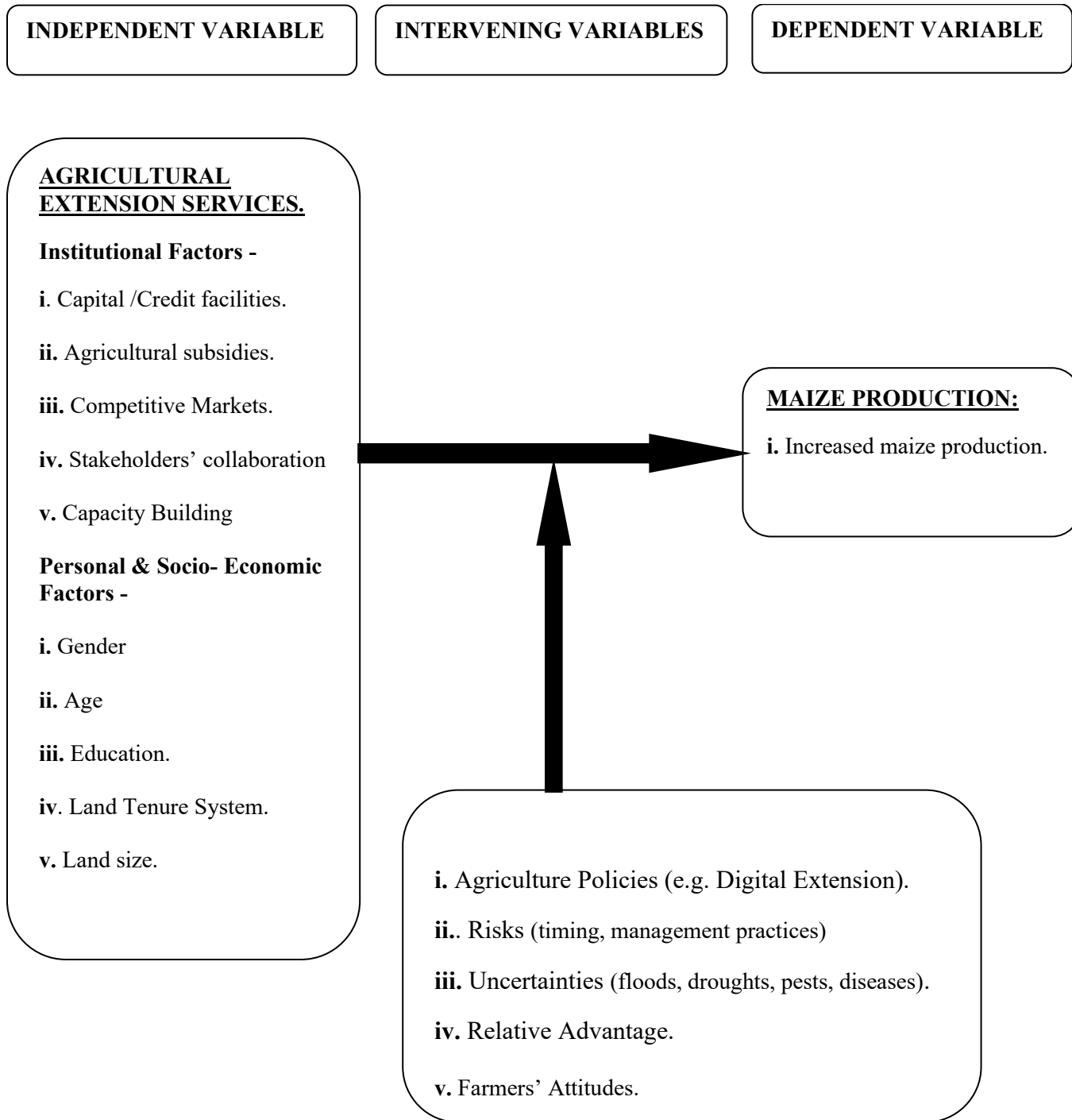
providing extension services to well-resourced areas. However, even in the marginalized locations, lack of good infrastructure, lack of enough money and extension workers who are not well trained rendered the provision of services hard. It was also determined that when there was a non existence of coordination between central and local governments, service delivery usually became ineffective. Even though the findings were meaningful, the study did not discuss how digital platforms might address service delivery issues. Also, the report failed to compare the results of different districts after the decentralization was put in place.

In Kenya, Muhumed and Minja (2019) reported that devolution made it easier for farmers in Wajir County to get extension help, farm supplies and financial support which improved their food productivity. In contrast, Mutuga (2018) noted that fish farming productivity went down in Laikipia County because of rising costs, the end of subsidies and fewer extension services. In the same way, Kyambo et al. (2021) found that factors such as gender, education and income levels affected how aware farmers were of devolved agricultural services in Kitui County.

Overall, these studies highlight both the benefits and challenges of devolution in agricultural extension service provision. While decentralization has improved accessibility and responsiveness to farmers' needs, persistent financial constraints, inadequate staffing, and weak institutional coordination continue to limit its effectiveness.

## 2.7 Conceptual Framework

This study's conceptual framework was as follows – **Figure 2.1**



## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter presents the study site, research design, target and study population, the sampling strategy, sample size determination and distribution, validity and reliability of the data collection instruments, data collection methods, data analysis and presentation and ethical considerations.

#### **3.2 The Study Site**

This study was carried out in Kwanza Sub County of Trans Nzoia County. Kwanza Sub County is situated between Kitale town to the South, Endebess constituency to the West and Kapenguria town to the East. The administrative centre of the Constituency is found in Kwanza market. It covers an area of 465.3 square kilometers. The Sub County is divided into four administrative wards, namely Kwanza, Bidii, Keiyo and Kapomboi. The Sub County has a population of 203,821 persons (KNBS population census, 2019).

#### **3.3 Research Design**

This study was conducted using descriptive survey research design. The study is concerned with establishing the nature of relationship between devolution and provision of extension

services and its overall impact on food production and food security (Siedlecki, 2020). It specifically intended to investigate the relationship between devolution of extension services and food production and food security by farmers. Such issues are best investigated through a descriptive survey. The design enabled the researcher to collect, organize and evaluate data from by engaging the respondents who are at the centre of the study in their natural environment for honesty.

### **3.4 Study Population**

The targeted population is the maize farmers in Kwanza Sub County, Trans Nzoia County. These are 26,767 (91.2%) farmers registered in the maize for food value chain out of the 29,348 total number of farmers registered in Kwanza Sub County in all crop production value chains (KALRO-NAD portal, 2023/24 National Farmers Registration).

### **3.5 Sampling Strategy**

Purposive sampling was employed to obtain the key informants, by handpicking those that satisfy the characteristics of this study. These were from the various public and private agricultural institutions which will include Ministry of Agriculture, Research institutions, non-governmental organizations, and farmers' representatives.

#### **3.5.1 Sample Size Determination**

Kwanza Sub County has 26,767 (91.2%) farmers registered in the maize for food value chain out of the 29,348 total number of farmers registered in crops value chains in the Sub

County. To determine the appropriate sample size, Krejcie & Morgan (1970) provide a formula for sample size determination in a finite population:

$$n = \frac{X^2NP(1-P)}{e^2(N-1) + X^2P(1-P)}$$

Where:

- $n$  = Required sample size
- $N$  = Population size (26,767)
- $e$  = Acceptable sampling error
- $X^2$  = Chi-square of degree of freedom 1 and confidence 95% = 3.841
- $P$  = Proportion of population (if unknown, 0.5)

Using this formula, Krejcie & Morgan (1970) recommend a sample size of 379 for populations up to 30,000. This study adopted a sample size of 379 respondents, selected using a cluster sampling technique where respondents were grouped in clusters of five farmers apart to ensure adequate representation across the sub-county (Vaghela, 2024).

### **3.5.2 Sample Size Distribution**

The KALRO-NAD portal (2023/24 National Farmers Registration), gives 26,767 as farmers registered in the maize for food value chain out of the 29,348 total number of farmers registered in all crops value chains in Kwanza Sub County. The proportion for each ward was calculated by dividing the sample size (379) by the target population (26767), giving a proportion of 0.014159. From the data in the KALRO-NAD portal, Bidii ward has 2499 maize farmers, Kapomboi ward has 8597 maize farmers, Keiyo ward has 5728 maize farmers and Kwanza ward has 9943 maize farmers. Using the proportionate

sampling, the sample sizes were Bidii Ward 35 maize farmers, Kapomboi ward 128 maize farmers, Keiyo Ward 84 maize farmers and Kwanza Ward 151 maize farmers. Within the wards small holder farmers are generally homogenous therefore simple random sampling was used to obtain farmers to be interviewed. This ensured every farmer in each of the four wards has an equal chance of being included in the study. Several key informants were interviewed including but not limited to officers from Ministry of Agriculture, Research institutions, non-governmental organizations, and farmers' representatives.

### **3.6 Data Collection Instruments**

Primary data collection was by use of interviews, document analysis and questionnaires which were close and open ended. Close ended questionnaires are useful in quantifying the data that was obtained while open ended are useful in obtaining views, perceptions and opinions of the respondents. The researcher administered interviews to the key informants to obtain true information. The primary data was collected with the help of research assistants who was trained to undertake the administration of questionnaires to the respondents (Kuphanga, 2024).

#### **3.6.1 Validity and Reliability of the Research Instruments**

The questionnaires which are the primary data collection tool was modified to suit the study objectives and submitted to research experts (lecturers and research officers) who modified and improved on it. A pilot study on a small sample of respondents was also conducted before the main research is done in the neighboring sub county of Kiminini as

the two sub counties have similar ecological characteristics (O’Leary, 2011) to find out any weaknesses and a correction was done. The sampled respondents were excluded in the main study (Anderson et al. 2024).

### **3.7 Data Collection**

Both primary and secondary data was collected by use of interviews, document analysis and questionnaires. Primary data was collected from the sample population of farmers in the study area. This contributed to the understanding on how extension services have impacted on food production. Interview guides with open ended discussion questions was used to collect data from selected key informants. Secondary data was obtained by reviewing county annual agricultural reports, county integrated development plans as well as reports from other agricultural institutions.

### **3.8 Data Analysis and Presentation**

Data was cleaned by reviewing all questionnaires and interview guides for completeness and consistency. The data was then captured, coded, analyzed by a statistical package (SPSS) and summarized using mean, median and mode and measures of dispersion such as range, quartile deviation, standard deviation and variance to describe a group of subjects. Analyzed data was presented in tables, graphs and charts. Correlation and regression analysis was done to show causal effect and for understanding the relationship between variables.

### **3.9 Ethical Considerations**

Prior arrangements and authorization were made with the relevant local leaders and authorities before proceeding for the study. Formal permission was also sought from the Post graduate school of Masinde Muliro University of Science and Technology. Each respondent was also informed of the purpose of the study, expected duration of the study, any risks or discomforts to the respondents, any benefits and extent of privacy and confidentiality before beginning any interviews. They were also assured of that any sensitive and personal information was not shared in any other forum except for purposes of the study. The respondents were treated with respect and dignity. Age, culture, religion and social class of the respondents were respected. The privacy and confidentiality of the respondents which involves gaining access to some lists and files to obtain samples for study was respected since all information obtained was in strict confidence. The respondents had the right to remain anonymous as well as freedom to ignore items that they do not wish to respond to and participate in the study voluntarily (Mirza et al. 2023).

## CHAPTER FOUR

### RESULTS AND DISCUSSION

#### 4.1. Introduction

This chapter presents the results of the analysis, findings and discussions based on the research objectives of the study.

#### 4.2. Response Rate

*Table 4.1: Questionnaire Return Rate*

<b>Questionnaire</b>	<b>Number</b>	<b>Percentage</b>
<b>Delivered</b>	379	100
<b>Returned</b>	374	99
<b>Not returned</b>	5	1

#### 4.3. The Current Status of Devolved Agricultural Extension Service Provision by The County Government of Trans Nzoia and Other Stakeholders

Descriptive analysis included description of frequencies, percentages, mode and median. The findings were presented in tables as below. The statements (indicators of extension service) were anchored on a five-point Likert-type scale ranging 5= Strongly Agree (SA), 4= Agree (A), 3= Undecided (U), 2=Disagree (D), 1=Strongly Disagree (SD) and respondents were asked to indicate the extent to which they agreed to the questionnaire statements during data collection.

**Table 4.2: The Current Status of Devolved Agricultural Extension Service Provision by The County Government of Trans Nzoia and Other Stakeholders:**

<b>Statement</b>	<b>1.SD</b>	<b>2.D</b>	<b>3. U</b>	<b>4.A</b>	<b>5.SA</b>	<b>Mode</b>	<b>Median</b>
The County Government of Trans Nzoia provides adequate agricultural extension services to farmers.	45%	25%	10%	15%	5%	1	2
The extension officers are easily accessible to farmers in Kwanza Sub County.	30%	35%	10%	20%	5%	2	2
Agricultural extension services are regularly provided by the County Government.	35%	30%	5%	25%	5%	2	2
The County Government collaborates effectively with other stakeholders in providing extension services.	50%	30%	10%	5%	5%	1	1
Farmers are satisfied with the quality of extension services provided by the County Government.	30%	30%	15%	20%	5%	2	2
The training provided through extension services is relevant to the current agricultural needs.	45%	20%	10%	15%	5%	1	2
Extension services by stakeholders complement those provided by the County Government.	40%	25%	10%	5%	15%	1	2

The findings from Table 4.2 indicate that the majority of respondents (70%) disagree that the County Government of Trans Nzoia provides adequate agricultural extension services to farmers, while a mere 20% agreed. Mode score 1 and the median of 2 indicates a

feeling of dissatisfaction in general among farmers with the responses being relatively scattered but are still in the negative perception. Such discontent might be determined by socioeconomic conditions like the economic constraint of smallholder farmers that cannot afford to obtain alternative extension services, and literacy rates that influence their capability to enjoy the available programs.

A considerable number of the respondents (65percent) were in opposition to the notion that the presence of extension officers to farmers is readily available to farmers in the Kwanza Sub County. Only 25% of respondents agreed. The mode score of 2 with a median 2 implies that the availability of extension officers is a significant issue, and majority of the respondents are feeling that they are not easily accessible. This problem is further compounded by the lack of infrastructure in the rural localities which have substandard transport services and road systems that make it difficult to access extension agents as well as to participate in training programs by farmers.

Most of the respondents (65%), refuted that the County Government offers the services of agricultural extension on a regular basis. Only 30% of respondents agreed. The mode score 2 with median of 2 also corroborates the opinion that these services are irregular or uncommon to the farmers. These irregularities may be assisted by limited government financing and logistical aspects since lack of resources may make it hard to organize and hold regular trainings to farmers.

Many respondents (80% of the respondents) did not agree that the County Government works successfully with other stakeholders in the provision of the extension services. Only 10% agreed. All the mode score of 1 and median of 1 shows that there is a general

perception that there is a poor or ineffective collaboration between the County Government and other stakeholders. This non-cooperation can be due to institutional inefficiencies, financial limitations, and a lack of formal cooperation with the players of the private sector that can improve the provision of the extension services.

The answers indicate that the majority of farmers are not satisfied with quality of the extension services. Approximately 60% did not agree that they are happy with the services offered and only one-fourth of the respondents said they are happy with the services. Mode of 1 with a median of 2 is indicative that, although dissatisfaction is the most dominant mode, the responses are more varied than when the other aspects are used. Better experiences with extension services might exist between higher education farmers and agricultural cooperatives and isolated smallholder farmers having no other source of agricultural knowledge.

Most of the respondents (65% of them) rejected the idea that the training offered under the extension services is what is relevant to the contemporary agricultural demands. Only 20% agreed. The mode score of 1 with median of 2 indicates high dissatisfaction, farmers find the training to be somehow old or not in tandem with their needs. This could be owed to the reluctance to embrace modern farming practices and technologies which are usually costly in terms of finances, which small-scale farmers are unable to afford..

The results indicate that two-thirds did not agree that other stakeholders offered the same services the County Government offers, which are effective in the process. A small proportion (20%) agreed. The median of 2 with mode score of 1 portrays that farmers feel there is no synergy between the County Government and other stakeholders in the

provision of extension services. The poor cooperation between government, non-governmental organizations, and other players in the private sector can be a constraint to farmers to access diversified sources of agricultural information and therefore strengthening the problem of farmers in enhancing productivity and adopting modern techniques.

According to the results of the interviews (Sub County agricultural Officer), the present situation with the agricultural extension services in Kwanza Sub County can be characterized as the already established system of the resource-constrained network of the extension officers. It has a County Executive Committee Member, Agriculture, a Chief Officer, Agriculture, a Director, Agriculture, a Sub County Agricultural Officer, a few of them a subject matter specialist and a Ward Agricultural Officer. Nevertheless, in spite of this structure, one of the drawbacks is lack of adequate staffing. The farmers like the fact that there are extension officers, but as they acknowledge, the small population of the officers means that there are no frequent and convenient consultations with the farmers. According to one of the respondents, The county government has a system of extension officers in every ward, the only restriction is the limited numbers to meet and speak to the farmers regularly (Interviewee 1). The issue of staffing shortage is a direct result of devolution because the counties have small funds to hire and keep extension officers.

The other stakeholders like the NGOs and the private industry have a complementary role as they provide innovation, research and technology by way of exhibitions and platforms that aid in the spread of agricultural information. Agricultural Society of Kenya (ASK) is another college partner that will assist in introducing new market and marketing channels.

According to one farmer, ASK, in particular, goes hand in hand with the stakeholders to adopt innovation, research and technology through exhibitions that are aimed at bestowing dissemination of farming and trade technology and a platform to market and trade in agriculture (Interviewee 2).

Cooperation between the County Government and the stakeholders is deemed to be ineffective, and the challenges are still present. One of the respondents responded, yes, collaboration entails work with all stakeholders in the agriculture sector to the common good of farmers in the different value chains (Interviewee 3). Nonetheless, extension services have not always been available as a result of staffing shortages, and some farmers have a problem accessing services routinely. As far as the applicability of the training offered is concerned, the farmers utilizing the provided services (20 percent of them, on average) tend to find it useful because it focuses on the current needs of the farmers in agricultural production, with one of them commenting, in turn, that the trainings are relevant to the needs of the farmers, so the agricultural production is bound to increase (Interviewee 4).

Such results do not contradict the study by Muriuki and Kimani (2022), who in their study entitled *The Role of Agricultural Extension Services in Food Security in Kenya*, analyzed the issue of the role of agricultural extension services in the food security of Kenya. It looked at the relationship between agricultural extension services and food security as well as agricultural productivity. As shown in their results, well-organized extension services are very effective in facilitating accessibility of the farmers to information, resources and training that eventually translate to high agricultural outputs. Nevertheless, the paper fails

to clearly examine the impact that devolution has on the development of these services which creates a vacuum that this paper would fill.

On the same note, the results can also be compared to those of Karanja and Mulu-Moore (2022), as in their work *Agricultural Extension Services and Their Impact on Farm Productivity in Kenya* they examined the efficiency of such services in raising the productivity of farms. The researchers discovered that timely guidance and assistance of extension officers are very important to enhance farming practices and output. Nonetheless, their paper fails to determine whether the county governments have become better in service delivery due to their devolution or they remain inefficient in structure, which is another gap in the research.

To conclude, farmers typically have a positive attitude towards agricultural extension services, although the issues of staffing, the quality of offered services, and the lack of funds remain. Devolution was meant to enhance these services to make them more accessible to the people, but its effect is both positive and negative. Strengthening county-level capacity, increasing funding for extension services, and improving collaboration between counties and stakeholders will be essential for maximizing the benefits of devolved agricultural extension services in Kwanza Sub County.

#### **4.4. Effect of Devolved Agricultural Extension Services on Food Production:**

Descriptive analysis included description of frequencies, percentages, mode and median and the findings were presented in tables as below. The statements (enablers of maize production) were anchored on a five-point Likert-type scale ranging 5= Strongly Agree (SA), 4= Agree (A), 3= Undecided (U), 2=Disagree (D), 1=Strongly Disagree

(SD) and respondents were asked to indicate the extent to which they agreed to the questionnaire statements during data collection.

**Table 4.3: Effect of Devolved Agricultural Extension Services on Food Production:**

<b>Statement</b>	<b>1.SD</b>	<b>2.D</b>	<b>3.U</b>	<b>4.A</b>	<b>5.SA</b>	<b>Mode</b>	<b>Median</b>
Agricultural extension services have led to an increase in maize production in Kwanza Sub County.	50%	15%	10%	10%	15%	1	1
Credit facilities are easily accessible to farmers and have improved food security in Kwanza Sub County.	50%	30%	10%	5%	5%	1	1
Farmers have adopted better farming practices due to the extension services provided.	40%	25%	5%	25%	5%	1	2
The information provided by extension services is practical and easy to implement.	50%	10%	5%	30%	5%	1	1
Farmers believe that access to agricultural subsidies has enhanced maize production in Kwanza Sub County.	45%	15%	25%	10%	5%	1	2
The devolved system of government has made agricultural extension services more accessible to farmers.	40%	25%	10%	15%	10%	1	1
Farmers feel that their input is considered in the planning and provision of extension services under the devolved system.	50%	30%	15%	3%	2%	1	1

According to the results of Table 4.3, there is a high level of dissatisfaction among farmers on whether agricultural extension services can affect the maize production in Kwanza Sub County. Most of the respondents (65 percent) did not agree that these services have contributed to an increment in the production of maize, mode of 1 and the median of 1. This implies that farmers are unable to see much productivity improvement as a result of extension services, which explains why more effective agricultural support programs are needed to suit local farming conditions.

On the same note, farmers do not have easy access to credit facilities, and they do not seem to contribute towards the enhancement of food security. Farmers only get formal agricultural financing in small proportions, most of them are dependent on informal lenders or do it themselves with savings and this restricts their capacity to grow or enhance productivity. Over half of the respondents (80%), disagreed with this statement and it gave a mode score of 1 and a median of 1. These findings imply that farmers are not able to invest in their farming operations to make the necessary changes due to financial constraints and this is why more affordable and accessible credit sources should be used to augment food security.

The statistics also show that extension services have not resulted in farmers adopting better farming practices in a large scale. A big percentage of 65% of the respondents did not agree to this assertion giving a mode of 1 and a median of 1. There were complaints among farmers that training and advice given by extension officers is not practical, relevant and interesting enough to make people adopt better methods.

Moreover, the knowledge base of the extension services is viewed as unrealistic and challenging to apply. Over fifty percent of the respondents (60 percent) did not agree to this statement, and the other one resulted in a leading mode of 1 and median of 1. It highlights the importance of training methods that can be easily understood and that focus on learning by practice and solutions that are localized.

The farmers also fail to see how the agricultural subsidies have greatly enhanced the production of maize in Kwanza Sub County. Most people (60 percent) did not agree with this statement, which gave the mode of 1 and the median of 2. Farmers reported that they were faced with difficulties in accessing the subsidies, bureaucracy or lack of adequate subsidies in terms of value that would not significantly change the level of production. Likewise, farmers propose that subsidies not be restricted to the fertilizers alone but also to certified seeds, farm machineries, pesticides, herbicides etc.

In the case of the devolved system of government, there is a general feeling that it has failed to make agriculture extension services more accessible. A significant proportion of 85% of the respondents expressed the opposite, mode of 1 and a median of 1. This implies that even with decentralization, there are still bottlenecks and inefficiencies in service delivery and this limits effectiveness of county-level agricultural support.

Finally, the farmers are of the view that their input is not well taken into account in the planning and delivery of extension services in the devolved system. Fourths of the respondents (80%) were in agreement which resulted in mode of 1 and a median of 1. This

is an indication that agricultural extension programs are not participatory as far as, farmers participation in the decision-making processes should be increased so that the services that are given can be tailored to their actual needs.

The results create a worrying outlook of the provision of agricultural extension services in Kwanza Sub County. Accessibility, effectiveness, and impact of extension services, credit facilities, and subsidies are much disliked by farmers. Practicality of training and relevance of the training would have enhanced the effectiveness of the extension programs, which is further weakened by the perceived exclusion of farmers in the decision making processes. To resolve these questions, the policy makers ought to consider participatory solutions, make credit and subsidies more accessible, and make extension training more relevant and of superior quality to achieve improved agricultural performance.

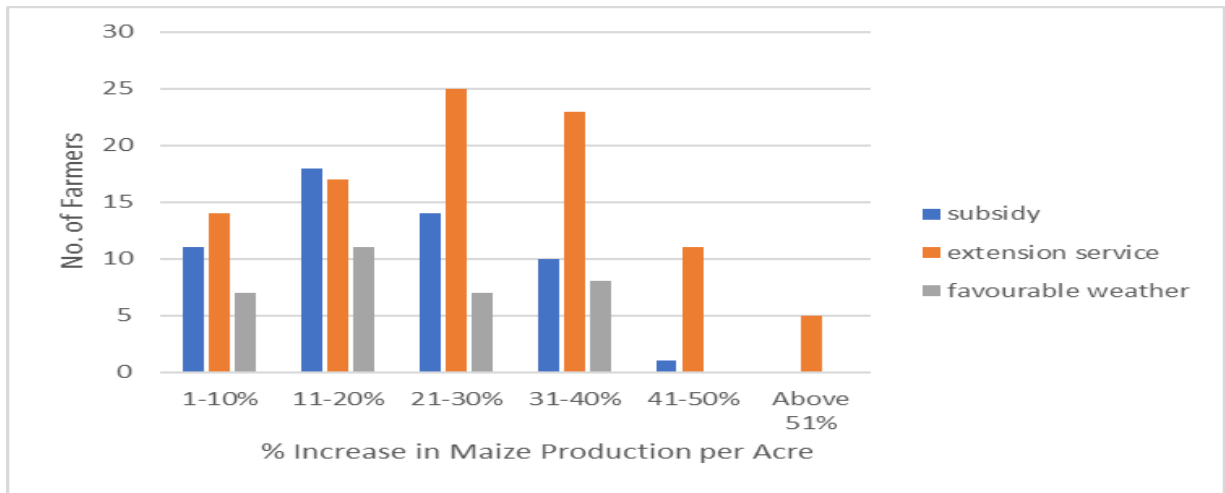
The same year, interview results of farmers who answered the question of positive influence of agricultural extension services on maize production in Kwanza Sub County found a contrasting opinion, 20% of the farmers claim that there are observable increase in yields. These farmers are happy with the contribution that these services have made to improving food security in the region. One of the respondents declared that, *Yes, there is an increment in the production of maize (Interviewee 5). This growth has also led to the increase in food supply whereby maize is easily available in the local markets at reasonable prices. The other farmer said that the region is also seen to be food secure due to an increment in production. Maize is easily found in the local markets and at reasonable*

*prices*" (Interviewee 6). Nevertheless, the same findings are explained by fertilizer subsidy which has caused a rise in the area of maize.

It has been contributed by the introduction of better farming practices and farmers who have implemented recommended agronomic practices like early land preparation, timely planting on the onset of rainfall, and the use of certified seeds and fertilizers as one farmer described it, "Few farmers who have adopted recommended agronomic practices like early land preparation, timely planting on the onset of rainfall, and the use of certified seeds and fertilizers and with the support of extension services have enhanced the maize yields and quality" (Interviewee 7).

They were requested to add the fact whether they could see some growth of maize production per acre, (comparing the seasons 2022 and 2023). Out of 374 interviewed farmers only 182 (49) out of the therein agreed that there should be an increase in the production of maize per acre and cited the primary cause(s) that could have caused the increase. The chart below captures the responses.

**Figure 4.1: Estimated Percentage Increase in Maize Production/Acre and reasons for increase (2022 versus 2023 seasons).**



The findings presented in the graph (Figure 4.1) illustrate that extension services to farmers leads to better farming practices hence an increase in maize production. At least 52% attributed the increase to access to extension services, another 30% believed it was through the fertilizer subsidy program and only 18% attributed it to favorable weather. Further more as a result of extension the farmers realized a higher percentage increase per acre of between 21% to above 51% as compared to reasons of subsidies and favorable weather.

**Table 4.4: Correlation matrix for Agricultural Extension Services and Food Production**

Variable	Maize Production Impact	Credit Access Impact	Adoption of Better Practices	Practical Information
Maize Production Impact	1.000	0.988	0.999	0.930

<b>Credit Access Impact</b>	0.988	1.000	0.985	0.975
<b>Adoption of Better Practices</b>	0.999	0.985	1.000	0.923
<b>Practical Information</b>	0.930	0.975	0.923	1.000

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The findings from Table 4.4 indicate that the adoption of better farming practices is the most significant factor influencing maize production in Kwanza Sub County, with a near-perfect correlation of 0.999. This is in line with field reports that report that farmers who weighed the recommended practices like planting on time and correct use of fertilizer usually recorded good harvests. This strengthens the notion that behavior change in farmers like better methods of planting, soil protection and pest control is important in increasing yields. Even the most good intentions of agricultural interventions could not yield any significant outcomes without the process of popularizing best practices.

Also, access to credit (0.988) and practical information (0.930) have a high impact on maize production, emphasizing the role of finances and appropriate agricultural knowledge. Access to credit by farmers gives them more opportunities to invest in quality inputs like purchasing better seeds, fertilizers, and equipment which translate into increased yields. In the meantime, viable and implementable farming knowledge would help farmers with the adoption of current practice in order to maximize the productivity.

The correlations are high, but they cannot be viewed as evidence of the direct causality, but as evidence of strong associations between the variables. These results imply that agricultural policies must be taken in a balance approach through the combination of

training initiatives, accessibility of funds, and extension services as strategies to enhance sustainable changes in the production of maize. Considering that an investment in one area like providing more access to credit without proper training could not produce the necessary effect. An integrated approach involving augmentation of the understanding of farmers, availing financial assistance as well as accessible expansion services will be vital in bettering agricultural results in the area.

**Table 4.5: Regression Analysis for Agricultural Extension Services and Food Production**

<b>Variable</b>	<b>Coefficient (<math>\beta</math>)</b>	<b>Standard Error</b>	<b>t-value</b>	<b>p-value</b>
<b>Constant</b>	2.7	0.45	6.0	0.08
<b>Credit Access Impact</b>	0.50	0.09	5.56	0.11
<b>Better Practices</b>	0.85	0.07	12.1	<b>0.03</b>
<b>Practical Information</b>	0.30	0.06	5.0	0.13

According to the results of Table 4.5, better farming practices ( $p = 0.03$ ) are that which provides the best predictors of maize production in Kwanza Sub County. This explains the need to translate agricultural knowledge to practice because it is not that important to just give information to farmers unless they take steps to adopt better methods. Good extension services must thus center on closing the knowledge versus practice to make major changes in crop yields.

Although there is a positive relationship between credit access and practical information and maize production, the insignificance of the statistics indicates that financial assistance does not necessarily translate into an increase in yields. The farmers should also be

provided with the skills which would make them utilize credit well indeed so that money should be channelized towards the productivity enhancing inputs like better seeds, fertilizers, and modern ways of farming. This is due to the fact that the availability of financial resources without the right direction may not affect the performance of agriculture in a very significant way.

Agricultural policies need to be used to embrace best practices through emphasizing practical learning methods. It is possible to do so by using farmer mentorship programs, real life demonstrations and creation of model farms where farmers get to observe, practice and refine new techniques in real life. Policymakers can transform the agricultural extension system to be more effective and sustainable by incorporating experiential learning and using financial and technical assistance to stimulate an increase in productivity in the long term.

The results are consistent with the article named *The Impact of Agricultural Extension on Food Security in Sub-Saharan Africa*, (Omamo and Collins, 2023). They determined the effectiveness of agricultural extension services in promoting food security in various countries in the region. According to their findings, effective extension services result in enhanced production of staple crops like maize thus enhancing food security among the farming households. This underscores the importance of the extension services which are not only beneficial in assisting the individual farmers but also in augmenting the food security programs at large. Besides, the results are comparable to Abate (2022), in their article *Assessing the Impact of Agricultural Extension Services on Food Production in Kenya*. They research the impact of these services on the level of food production. Their

findings revealed that there was a positive relationship between agricultural extension access and food production, especially in maize. Although these studies support the importance of extension services, they fail to precisely explain how devolution has affected service delivery, funding and sustainability an element that needs to be explored further in the Kwanza Sub County.

The connection between agricultural extension services and maize production is also studied in the paper *The Influence of Agricultural Extension Services on Maize Production in Rural Areas of Kenya* by Wanyonyi and Limo (2021). Their study showed that farmers who use the services of extension realize good yields and better farming practices. This highlights the importance of such services in boosting production of maize, and the concrete gains that accrue as a result of a successful extension service. Last but not least, the results are also consistent with Mwangi and Kariuki (2020) who conducted a study on the effect of agricultural extension services on the production of maize in the study, *Impact of Agricultural Extension Services on Maize Production: Evidence from Eastern Kenya*. Their results showed that the availability of extension services correlates with higher yields of maize and the use of modern methods of farming. This highlights the importance of agricultural extension services in enhancing the general agricultural performance especially in production of staple crops.

#### **4.5. Challenges of Devolved Extension Service Provision**

Descriptive analysis included description of frequencies, percentages, mode and median and the findings were presented in tables as below. The statements were anchored on a five-point Likert-type scale ranging 5= Strongly Agree (SA), 4= Agree (A), 3= Undecided

(U), 2=Disagree (D), 1=Strongly Disagree (SD) and respondents were asked to indicate the extent to which they agreed to the questionnaire statements during data collection.

**Table 4.6: Challenges of Devolved Extension Service Provision:**

<b>Statement</b>	<b>1.SD</b>	<b>2.D</b>	<b>3.U</b>	<b>4.A</b>	<b>5.SA</b>	<b>Mode</b>	<b>Median</b>
Lack of sufficient funding is a major challenge in the provision of agricultural extension services.	2%	3%	10%	30%	55%	5	5
Inadequate staffing of extension officers affects the quality of services provided.	2%	3%	10%	25%	60%	5	5
Poor coordination among stakeholders is a challenge in the provision of extension services.	2%	3%	15%	30%	50%	5	5
Farmers face difficulties in accessing extension services due to logistical challenges.	2%	3%	15%	25%	55%	5	5
There is a need for more frequent and updated training for extension officers to improve service delivery.	2%	3%	10%	25%	60%	5	5
More innovative approaches are required to improve the delivery of agricultural extension services.	2%	3%	10%	30%	55%	5	5

The findings from Table 4.6 indicated that there are an array of problems which have hampered the relevance of agricultural extension services in Kwanza Sub County. Another significant finding is that the majority, 85 percent of the farmers expressed their concern

over inadequacy of funding as a major limitation hindering access to agricultural extension services with mode being 5 and median being 5. In fact, it would come to mean that expansion is constrained by economic conditions and therefore unable to be comprehensive and uniform enough in order to not create gaps. Lack of funds is a challenge to investment for higher skills training, extension services and the necessary agro-inputs among farmers.

Similarly, the appointment of extension officers is considered to be a very important issue where 85 percent of the respondents perceive it in this status. The mode is 5, and the median is 5, indicating a very high level of consensus on this matter. Absence of extension officers' mean that farmers have limited access to expert services, trainings does not take place, farmer follow-ups are not done and this result in a general reduction on agricultural extension services effectiveness food productivity and modern agricultural uses. Solving this issue requires strategic decision making regarding the investment in human resource, and to determine appropriate incentives for attracting and holding to qualified personnel.

Absence of collaboration among shareholders was not left behind as a hot topic since 80 percent gave Oui as an answer. Mode score of 5 and median score of 5 shows that service delivery is not coordinated, that is the government agencies/rescue organizations do not operate as a single organization to save people. Effective stakeholder collaborations are also significant to pool resources, eliminate overlaps of services and enhance the effectiveness of extension programs.

The delivery of extension services to farmers is also a logistical challenge to farmers with 80% of the respondents admitting to this. The mode score of 5 and a median of 5 bring into perspective the fact that geographical constraints, bad road networks, and absence of transport infrastructure are some of the impediments to effective agricultural knowledge dissemination. To close this divide, it should consider the mobile extension service and digital solutions to access the farmers in remote places.

The other important conclusion is that the extension officers should be trained more often and more updated, and 85 percent of the respondents confirmed and strongly supported it. A mode score of 5 and a median of 5 indicates the high appreciation of the fact that old knowledge and skills of extension officers diminishes the impact of training programs. The improvement of the current level of professionalism and introducing the new technologies into the sphere of agriculture is the key to guaranteeing that the extension officers offer the farmers the high level of the quality of assistance.

Finally, there is a call of greater innovation on how agricultural extension services can be better provided, with 85% of the respondents strongly agreeing or agreeing. Mode score of 5 and median of 5 shows that the conventional practice of extension services provision might not be adequate any more. Educational technologies, demonstration farms, farmer field schools, and participatory methods need to be adopted to become more responsive to the needs of farmers in agricultural extension.

All of this brings out the fact that there is a need to take a multidimensional approach in order to improve agricultural extension services. The need to close the funding gaps,

enhance the staffing, coordinate the stakeholders, overcome the logistical hurdles, invest in the ongoing training, and implement the innovative approaches are all essential to the sustainability and efficacy of the extension programs.

Though, agricultural extension services have a positive influence on the county, County Government has a number of challenges in offering services within the devolved system. Devolution has also handed over the burden of providing agricultural extension services to the county governments and theoretically this is seen to put the services nearer to the people. Nevertheless, the counties may have a great limitation of capacity in funding, staffing, and coordination that influence service delivery.

The problem of staffing is also one of the most important, as there are not enough extension officers to cover all the farmers. According to one respondent, the extension staff might not be available to the farmers at the required time (Interviewee 1). The availability of the few officers coupled with logistical factors like poor transportation limits the capacity of the extension staff to access the farmers in the remote locations. There are also the issues of funding that make things even more challenging, as there is a lack of funds to pay the fieldwork and support personnel. According to one interviewee, there was a deficiency of perpetual training and low capacity of directing farmers to new innovations (Interviewee 2). Skill and limited training experienced by the extension officers especially in innovation adoption, monitoring and evaluation also influence the quality of service delivery.

The results also indicate that agricultural extension services are more efficient in some counties than others based on budgetary allocations and priorities of governance. Some

counties have invested on digital platforms and new extension models, but those with little resources have a hard time sustaining basic services. Political influence in the allocation of funds and decision making has also been cited as one of the problems as some of the county governments are focusing on the short term projects when compared to the long term agricultural support program.

In order to overcome these problems, farmers propose to recruit more extension officers and to offer them on-going professional growth. According to one of the respondents, the County government must invest more in continuous professional development and skills training to the extension staff (Interviewee 3). Good working relationships with the stakeholders and collaboration with technology providers may also aid in modernizing agricultural extension services and fill the existing gaps.

The result is consistent with that of Bebe (2020) who discussed the numerous problems the agricultural extension services in Kenya face in their article, "Challenges Facing Agricultural Extension Services in Kenya." The main problems they point out include lack of finances, understaffing, and lack of coordination among the stakeholders. The paper has highlighted the need to consider such issues in order to enhance the efficiency of extension services that are essential in helping farmers. It is also observed that the devolution has its opportunities as well as its challenges since the counties governments are different in terms of the capacity to maintain good extension services.

In the same vein, the results are also congruent with Kilelu (2019) who considered the agricultural extension service situation in their study titled the Evaluating the Effectiveness of Agricultural Extension in Kenya: Challenges and Opportunities. They brought out the

challenges encountered in these services including lack of resources and training of the extension officers. According to their study, it is important to overcome these challenges in order to increase service delivery and adequately support the agricultural community. Besides, they state that counties must come up with new ways of extension, using technology and alliances to address the gaps that exist.

The results depicted that agricultural extension services are crucial in enhancing agricultural production, but there are a number of challenges that do not favour the effectiveness of the activities especially in the devolved system of governance. Such problems as insufficient financing, lack of staff, logistical issues, and poor coordination are still important obstacles. Although the agricultural extension services are now much nearer to the farmers through the process of devolution, County governments need to fill the gap of capacity, allocate enough resources, and explore new ways of offering services so as to enhance service delivery. To improve the agricultural extension services and to make sure that the agricultural development will be long-term, the improved training, staffing, and better coordination among the stakeholders will be necessary.

## **CHAPTER FIVE**

### **SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1. Introduction**

This section presents the summary of findings of the study, conclusions and recommendation of the study as well as suggestions for further study.

#### **5.2. Summary of Findings**

##### **5.2.1. The Current Status of Devolved Agricultural Extension Service Provision by The County Government of Trans Nzoia and Other Stakeholders**

According to the findings, most of the respondents do not concur with the fact that the County Government of Trans Nzoia offers proper agricultural extension services to the farmers. This shows that service delivery should be improved in order to serve the needs of all farmers. As to the accessibility of the extension officers, there was a considerable percentage of people who differed with the idea that the extension officers are readily available to the farmers in Kwanza Sub County. It is one of the significant worries, as the majority of the respondents exit them as a hard-to-access pointing to a possible dislocation in communication and accessibility. This implies that there must be a campaign to secure the uniform access to all farmers. Regarding the regularity of the extension services, most of the respondents did not agree with the fact that the County Government offers regularly extension services in the field of agriculture. These services are viewed as irregular or

infrequent by the farmers. These reactions show that there is a certain discrepancy in service provision, and this may have an impact on accessing support in a timely manner. More than fifty percent of the sampled people did not agree that the County Government works well with the other stakeholders in provision of extension services. This implies that there is an overall perception that the County Government and other stakeholders lack cooperation or work together. Such cooperation is critical to share the resources and transfer knowledge, but it can be improved. There is a challenge of satisfaction with the quality of the extension services. According to the responses, the majority of farmers are not satisfied with the quality of the extension services. This is an indication that there is a higher degree of dissatisfaction but a small degree more variation in responses than that of other factors. This problem can demotivate the use of the extension services which means that the quality of the services is crucial to increase the participation and results of the farmers. Most of the respondents opposed the fact that the training given through the extension services is not relevant to the present agricultural requirements. This implies dissatisfaction and the farmers feel that the training is obsolete or does not suit their needs thus requires constant evaluation in order to keep it in touch with the changing demands in agriculture. Further, the results show that the majority of respondents rejected the fact that extension services offered by other stakeholders are effective to complement those of the County Government. This shows that farmers do not feel that there is synergy between the County Government and other stakeholders in terms of extension service provision. Other stakeholders such as NGOs and the private sector are complementary because they can provide innovation and technology through one way such as exhibitions. According to one

of the respondents, collaboration entails cooperating with all the stakeholders in the agriculture sector towards the common good of farmers in the different value chains (Interviewee 3). These results show that although there is a strong base on the agricultural extension services in the Kwanza Sub County, the challenges that lie on how to manage the staffing, service quality, and accessibility are important in improving the overall delivery and effectiveness of the services..

### **5.2.2. Effect of Devolved Agricultural Extension Services on Maize Production in Kwanza Sub County**

The research evaluated the impact of agricultural extension services on the maize production in Kwanza Sub-County. Results show that such services have not contributed much towards maize yields improvements since majority of farmers did not find any substantial returns. Most of the respondents did not agree that extension services had led to a high production of maize. This implies that the present extension interventions are not suitably responding to some of the major agricultural productivity issues.

The other significant obstacle that has been found is that there is very little access to credit facilities that is necessary in the acquisition of superior inputs and technology. The greatest number of farmers complained of the lack of access to credit. This underscores the need to further develop financial support systems so that farmers could invest in new farming systems. Even with the best farming techniques, the absence of sufficient funding makes the effective implementation of the methods impossible.

Improved farming practices are also not greatly adopted, even where the extension services are present. Most of the respondents reported that they had not become better farmers. This implies that the training programs might not be practical and specific to the needs of the farmers. Most of the farmers find it difficult to apply what they learn to practical purposes and hence do not improve on the productivity aspect.

Moreover, such a problem as absence of practical information is easy to implement also prevents the effectiveness of the extension services. The knowledge offered by extension officers was practical only to very few farmers who agreed on the same. This shows an inconsistency between the advisory services and practice and as such, farmers find it hard to make use of the kind of training that they undergo. The accessibility, effectiveness, and influence of extension services are much disliked by farmers.

The government subsidies have also failed to bring about the desired change. The overwhelming majority of farmers did not agree that agricultural subsidies had helped to boost the production of maize. It is an indication that subsidy programs are not necessarily good-targeted or well-implemented to address farmers. Also, the devolved form of government has failed to make a big difference in the ease of access of the extension services. Most of the interviewees indicated that there was no service availability change with devolution.

Farmers consider that the way they are used in planning and offering extension services under the devolved system is not given enough attention. More than 50 percent of the interviewees did not agree. This indicates poor participatory planning in the programs of

agricultural extension, and there should be more involvement of farmers in decision making so that services are provided in accordance to the actual needs of farmers.

### **5.2.3. Challenges of Devolved Extension Service Provision that affect Maize Production in Kwanza Sub County**

The objective Three was to study the major issues influencing the delivery of agricultural extension services and its influences on the production of maize in Kwanza Sub-County. The results have shown that the biggest obstacles to successful delivery of extension services are the staffing shortage, lack of coordination among stakeholders, and insufficient funding which ultimately impact on the production of maize.

The issue of shortage of extension officers is one of the most serious challenges to be identified. The few extension officers available also lowers the availability of timely and viable agricultural advice to the farmers in order to promote application of better farming methods. The personnel deficit implies that either a significant portion of the farmers is not assisted or at least is not assisted properly as it impacts their productivity considerably. The solution to this issue would involve hiring and training more extension officers that would improve service delivery and contribute positively towards maize production.

The other egregious problem is lack of good coordination among the stakeholders which also impacts negatively on production of maize. There is poor coordination between the government agencies, non-governmental organizations, players in the private sector and farmers resulting in inefficiency in delivery of services. Farmers cannot get coherent and

good agricultural support as there are inconsistencies in the message, redundancy, and absence of streamlined policies. The inability to integrate different actors in the system of the extension leads to discontinuous services, which complicates the farmers to obtain required inputs, credit, and technical support. Improvement of efficiency of the extension services requires strengthening of the coordination mechanisms between the key players.

Further, the issue of funding came out as a significant problem that influenced agricultural extension services. The increment in funding would tend to improve the delivery of the extension services. Financial resources are limited functions of which the extension officers are unable to visit the fields, arrange farmer training, and supply the required agricultural inputs. Most of the extension programs face the problem of poor operational budgets and therefore it is hard to maintain outreach operations and provide effective interventions. By making agricultural extension services adequately funded, accessibility and effectiveness will be enhanced thus benefiting the maize farmers.

All these difficulties combined together such as lack of adequacy in staffing, lack of coordination, and financial limits pose major hurdles to the delivery of agricultural extension services to the communities, which consequently impacts on production of maize. Without access to properly designed and well-financed extension programs, farmers do not have an opportunity to apply the best farming practices, improve access to better seeds and farm inputs, and be able to adopt the use of climate-sensitive agricultural methods. This supports the idea that specific policy interventions are necessary to overcome such structural weaknesses..

### **5.3. Conclusion**

It is found that the present situation with agricultural extension services in the area of Kwanza Sub County demonstrates a resource-limited established mesh of extension officers. The research report shows absence of synergy between the County Government and other stakeholders in the process of providing the extension services.

The results reveal that farmers are highly dissatisfied with the impact of agricultural extension services on the production of maize in Kwanza Sub County. The positive outcome of agricultural extension services in maize production in Kwanza Sub County is attested only by few farmers who have undergone the extension services with observable changes in yields. This category of farmers values the assistance that these services have accorded them as far as food security in the area is concerned.

A number of challenges are related to the delivery of agricultural extension services and the most important is the lack of funds and staffing. There are also logistical problems like transportation challenges and the absence of appropriate infrastructure that limits the supply of extension officers, especially in the remote locations. The farmers also acknowledge that the extension officers have to be constantly trained in order to update them on the current farming ideas and innovations, which would enhance service delivery. More creative solutions are also required to address the changing needs of the farmers, including the application of technology in the delivery of services.

#### **5.4. Recommendations:**

Based on the findings of this study, the following recommendations are proposed:

- i. The County government of Trans Nzoia has prioritized agriculture in its CIDPs; however, it must address barriers to extension service by digitization and developing integrated and comprehensive digital platforms that connect maize farmers to extension services, access to financial services and real time market information. There is an urgent need for a multi-stakeholder approach in enhancing service delivery, as collaborative efforts ensure better resource allocation, knowledge sharing, and overall service efficiency.
- ii. The County Government should prioritize hiring additional extension officers to ensure adequate coverage across all wards. This enables more consistent and timely support for farmers, enhancing the overall effectiveness of extension services.
- iii. Advocate for increased funding from National Government and private sources to support agricultural extension programs. This ensures the provision of essential resources and training needed for effective service delivery.

#### **5.5. Suggestions for Further Study**

- i. Impact Assessment of Agricultural Innovations: Future research could focus on assessing the impact of specific agricultural innovations introduced through extension services. This could involve evaluating the adoption rates, effectiveness,

and sustainability of new farming techniques, technologies, and practices among different farmer demographics.

- ii. Gender Dynamics in Agriculture: A deeper exploration into the gender dynamics within agricultural practices and extension service utilization in Kwanza Sub county could provide valuable insights. Understanding the barriers faced by female farmers and how their needs differ from male farmers could inform more inclusive extension programs.
- iii. Longitudinal Studies on Food Security: Conducting longitudinal studies that track changes in food security levels in Kwanza Sub County over time would provide a clearer understanding of the relationship between agricultural extension services, production practices, and food security. Such studies could also assess the resilience of farming households to economic and environmental changes.
- iv. Effectiveness of Collaborative Approaches: Investigating the effectiveness of collaborative approaches between the County Government, NGOs, and private sectors in providing agricultural extension services could yield insights into best practices for resource sharing, knowledge transfer, and service delivery.

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**APPENDICES**

**APPENDIX 1: RESEARCH QUESTIONNAIRE FOR FARMERS**

**Influence of Agricultural Extension Services under Devolution on Maize Production in Kwanza Sub County, Kenya.**

The aim of this research is to determine the nature of relationship between agricultural extension services under devolution and its overall impact on maize production. It will create awareness among stakeholders on the contribution of extension services under devolution in enhancing maize production (food security and incomes) to farmers. The information given is for academic purposes only and was treated with utmost confidentiality.

**Date** ..... **Questionnaire**

**No.**.....

**Name of Farmer (Optional)**.....

**Ward**.....

**Mobile Phone No. (Optional)** .....

**PART 1: RESPONDENTS DEMOGRAPHIC CHARACTERISTICS**

*Please answer all the questions as best as you can. Please Tick as appropriate.*



**10. What was the approximate % increase (bags) per acre? (Compare years 2022 & 2023)**

- a) Nil [ ]                      b) Between 1-10 [ ]                      c) Between 11-20 [ ]  
 d) Between 21-30 [ ]                      e) Between 31-40 [ ]                      f) 41 and above [ ]

**11. What is the main reason for the increase in maize production?**

- a) Fertilizer subsidy [ ]    b) Extension services    c) Favorable weather [ ]

**PART THREE: STRUCTURED QUESTIONS BASED ON STUDY OBJECTIVES**

This is a structured questionnaire based on the study objectives, using a Likert scale of 1-5, where 5= Strongly Agree (SA), 4= Agree (A), 3= Undecided, (U) 2=Disagree (D), 1=Strongly Disagree (SD). Each objective is represented by seven statements.

**Objective 1: To Determine the Current Status of Devolved Agricultural Extension Service Provision by the County Government of Trans Nzoia and other Stakeholders:**

Statement	1.SD	2.D	3.U	4.A	5.SA
1. The County Government of Trans Nzoia provides adequate agricultural extension services to farmers.					
2. The extension officers are easily accessible to farmers in Kwanza Sub County.					
3. Agricultural extension services are regularly provided by the County Government.					

4. The County Government collaborates effectively with other stakeholders in providing extension services.					
5. Farmers are satisfied with the quality of extension services provided by the County Government.					
6. The training provided through extension services is relevant to the current agricultural needs.					
7. Extension services by other stakeholders complement those provided by the County Government.					

**Objective 2: To Assess the Effect of Devolved Agricultural Extension Services on Maize Production in Kwanza Sub County:**

Statement	1.SD	2.D	3.U	4.A	5SA
1. Agricultural extension services have led to an increase in maize production in Kwanza Sub County. (If you agree, by approximately what % has your maize production/acre increased?)					
2. The credit facilities provided have improved food security in Kwanza Sub County.					
3. Farmers have adopted better farming practices due to the extension services provided.					
4. The information provided by extension services is practical and easy to implement.					
5. Farmers believe that access to agricultural subsidies has					

enhanced maize production in the sub county.					
6. The devolved system of government has made agricultural extension services more accessible to farmers.					
7. Farmers feel that their input is considered in the planning and provision of extension services under the devolved system.					

**Objective 3: To identify challenges of devolved agricultural extension service provision that affect maize production in Kwanza Sub County:**

Statement	1.SD	2.D	3.U	4A	5.SA
1. Lack of sufficient funding is a major challenge in the provision of agricultural extension services.					
2. Inadequate staffing of extension officers affects the quality of services provided.					
3. The training and skills of extension officers are not sufficient to address farmers' needs.					
4. Poor coordination among stakeholders is a challenge in the provision of extension services.					
5. Farmers face difficulties in accessing extension services due to logistical challenges.					
6. There is a need for more frequent and updated training for extension officers to improve service delivery.					
7. More innovative approaches are required to improve the					

delivery of agricultural extension services.					
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**THANK YOU FOR YOUR TIME AND PARTICIPATION**

## APPENDIX 2: INTERVIEW GUIDE FOR KEY INFORMANTS

### **Influence of Agricultural Extension Services under Devolution on Maize Production in Kwanza Sub County, Kenya.**

The aim of this research is to determine the nature of relationship between agricultural extension services under devolution and its overall impact on maize production. It will create awareness among stakeholders on the contribution of extension services under devolution in enhancing maize production (food security and incomes) to farmers. The information given is for academic purposes only and was treated with utmost confidentiality.

**Date** ..... **Interview No.**.....

**Name of Respondent** (optional).....

**Organization/Institution name** .....

**Mobile** ..... **Phone** ..... **No.**  
(Optional).....

### **PART 1: Respondents Demographic characteristics**

Please answer all the questions as best as you can. Please Tick as appropriate.

#### **1. Gender**

a) Male [ ]

b) Female [ ]

**2. Highest academic qualification**

a) Diploma level [ ]

b) Degree level [ ]

c) Masters Level [ ]

(d) Others (specify).....

3. What is your Position in the organization/Institution?

4. Is your organization/Institution a public or private entity?

**PART 2:**

**Objective 1: To Determine the Current Status of Devolved Agricultural Extension Service Provision by the County Government of Trans Nzoia and other Stakeholders:**

1. How would you describe the current state of agricultural extension services provided by the County Government of Trans Nzoia?
2. What role do other stakeholders (e.g., NGOs, private sector) play in providing extension services in this area?
3. Do you believe that the County Government collaborates effectively with these stakeholders? If so, how? If not, what are the challenges?
4. In your opinion, are the extension services regularly available and accessible to all farmers?
5. How do you rate the relevance and quality of the training provided through these services?

6. What improvements, if any, have you noticed in the provision of these services under the devolved system of government?

**Objective 2: To Assess the Effect of Devolved Agricultural Extension Services on Maize Production in Kwanza Sub County:**

1. How have agricultural extension services impacted maize production in Kwanza Sub County?
2. Can you provide specific examples of how these services have influenced food security in the region?
3. What changes in farming practices have been adopted as a result of these services?
4. How do farmers perceive the effectiveness of extension services under the devolved system of government?
5. Do you believe that these services have been instrumental in improving maize yields and quality? Please explain.
6. Have there been any notable improvements in food security due to enhanced maize production supported by extension services?

**Objective 3: To identify challenges of devolved agricultural extension service provision that affect maize production in Kwanza Sub County:**

1. What are the main challenges faced by the County Government in providing agricultural extension services?

2. Are there any challenges related to funding, staffing, or coordination among stakeholders?
3. What specific difficulties do farmers face in accessing these services?
4. How do logistical issues, such as transportation, affect the delivery of extension services?
5. What gaps exist in the training and skills of extension officers, and how do this impact service delivery?
6. What strategies do you suggest to overcome these challenges and improve the effectiveness of extension services?

### **PART 3:**

#### **Recommendations and Conclusion**

1. Based on your experience, what recommendations would you give to improve the provision of agricultural extension services in Kwanza Sub County?
2. What additional support or resources do you think are necessary to enhance maize production and food security?
3. How do you envision the future of agricultural extension services in this area?

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**THANK YOU FOR YOUR TIME AND PARTICIPATION**

