Assessing the awareness of Agro ecological Approaches and their impact on Food Security in Matale Village, Matale Sub-County, Kibaale District

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DECLARATION

I Acio Beatrice, hereby declare that the work presented in this research report is my own original work. I have adhered to all relevant academic and ethical guidelines in the preparation and presentation of this research. All sources of information and data have been acknowledged appropriately. I confirm that this research has not been submitted previously for a degree award of this university or elsewhere

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ACIO BEATRICE

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APPROVAL

This is to certify that this report on the effect of agro ecological approaches on food security has been written under my supervision and is now ready for submission for examination.

.....

Mr. Mwanika Byamukama (Faculty mentor)

Date 16/10/2025.

Signed.....

DEDICATION

This report is dedicated to my beloved family, my father Mr. Okocha Christopher, my mother Mrs. Dengo Jenifer, uncles Mr. Ocen Jolly Pope, Mr. Odongo Francis, my sisters Ayo Lydia, Achola Laura, Akello Jackline, Ajwang Sherry, my brother Ogwang Jolly Joe and my friends for their combined efforts throughout my stay in the field.

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In a special and heartfelt manner, I extend my gratitude to my parents, Mr. Okocha Christopher and Mrs. Jenifer Dengo, for their invaluable financial, emotional, and spiritual support. I also indebted to my fellow academic peers, with whom I continuously networked within the field.

I take great pleasure in acknowledging my academic benefactors, including my faculty supervisor, Mr. Mwanika Byamukama and my field mentor Dr. Richard Lubega. Their supervision, guidance, encouragement, and unwavering support were pivotal in enabling me to fulfil the expectations of this research.

I extend sincere thanks to Matale Village for their invaluable assistance in providing the necessary stationary during my one-month research study. May they be blessed abundantly.

I express my heartfelt gratitude to the staff of Busesa demonstration farm for their unwavering support during my internship experience. Above all, my deepest appreciation goes to the Almighty God, who bestowed upon me the strength and life to carry out this study. All honour praise unto you.

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LIST OF ACRONYMS/ ABBREVIATIONS

ARU	African Rural University
CAP	Community Action Planning
EM	Epicentre Manager
FGD	Focus Group Discussion
PAR	Participatory Action Research
URDT	Uganda Rural Development Training Programs
VA	Visionary Approach
A/C	Agriculture Office
CAP	Community Action Planning

ABSTRACT

This study assessed the efficacy of agro ecological approaches, including Integrated Pest Management (IPM), agroforestry, and organic farming practices, on enhancing food security in Matale Village, Matale Sub-County, Kibale District. A mixed-methods approach was employed, integrating data from 109 survey participants and 14 key informants through focus group discussions, interviews, and field observations. Data was collected using interviews, questionnaires, field observations, and document reviews. Quantitative data was analysed using descriptive and inferential statistics via SPSS (version 27), while qualitative data was thematically analysed to explore recurring patterns and community perspectives. The findings revealed significant roles for women (57%) and youth (51% aged 18–30 years) in agriculture, highlighting the need for inclusive strategies. IPM practices, such as crop rotation (78%), maintaining cleanliness in the garden (81%), selection of disease-resistant varieties (80%) and biological controls (57%), significantly enhance food security, though barriers like limited adoption of natural pesticides and companion planting remain a challenge. Agroforestry improves soil fertility, biodiversity, and income diversification, yet adoption of tree-row planting is limited due to resource competition and technical knowledge gaps. Organic farming practices, especially composting (66%), are widely adopted, but challenges like labour intensity and skepticism hinder broader implementation. Perceptions of food security reveal disparities: 43% view the region as food secure, while 57% face moderate to severe insecurity. Food access is easy for 51% but challenging for 49%, while 67% report food affordability, 33% face financial barriers. Nutritional quality and supply stability remain concerns, with 59% noting dietary inadequacies and 46% reporting food supply instability. These findings underscore the need for targeted interventions, including capacity-building programs, resource support, and policy frameworks, to enhance the adoption of agro ecological practices and strengthen food security in Matale Village

1.0 CHAPTER ONE INTRODUCTION

This chapter presents the introduction, background, visionary statement, purpose of the study, objectives of the study, research questions, and scope of the study and the significance of the study.

1.1Introduction of the study

The research was conducted to assess the effect of agro ecological practices on food security in Matale village through Community Action Planning (CAP) in Matale Village, The results indicate that despite the use of conventional agricultural practices, food security still remains a challenge because of climate change, land degradation, and unsustainable agricultural practices demanding innovative solutions. While conventional agriculture increased yields, concerns regarding environmental sustainability and equitable access persist.To address these challenges effectively, it is imperative to adopt agro-ecological approaches that emphasize the sustainable management of agricultural ecosystems. Integrating agro-ecological approaches through farmer's group dynamics presents a promising strategy to address these challenges and enhance food security in Mattale Village.

1.2 Background

Matale Village, like many rural communities, faces challenges related to food security due to various factors such as climate change, land degradation, and unsustainable agricultural practices. To address these challenges effectively, it is imperative to adopt agro-ecological approaches that emphasize the sustainable management of agricultural ecosystems. Integrating agro-ecological approaches through farmer's group dynamics presents a promising strategy to address these challenges and enhance food security in Matale Village.

1.2.1 Historical Background

Agro-ecological approaches have evolved from traditional methods to more conventional, input-intensive approaches. During the Green Revolution between the 1940s and the late 1960s, there was a significant push towards the adoption of high-yielding crop varieties, chemical fertilizers, and pesticides.(Warren, 1998) While these methods initially led to increased productivity, they also resulted in long-term negative impacts on soil health, biodiversity, and the environment (Ullah et al., 2024).

In recent years, there has been a growing recognition of the limitations of conventional agriculture and a shift towards more sustainable practices. Agro ecology, with its roots in traditional farming knowledge and modern ecological science, has emerged as a viable alternative. The historical shift from traditional to conventional and now to agro-ecological practices reflects an ongoing journey towards achieving sustainable food systems in Matale Sub-county (Rosset & Altieri, 2017).

1.2.2 Contextual Background

Food security defined as the availability, access, utilization, and stability of food, remains a critical global challenge. (Berry et al., 2015) According to recent reports by food and agriculture organization (FAO), over 800million people worldwide suffer from chronic hunger, with sub-Saharan Africa and south Asia being the most affected region (Wudil et al., 2022). Conventional agriculture have contributed significantly to environmental degradation however, agro-ecological approaches offer sustainable solutions to the environmental challenges posed by conventional agriculture.

1.3 Conceptual Framework

Agro ecology is a holistic approach to farming that integrates ecological principles with agricultural practices. It focuses on creating sustainable and resilient farming systems by promoting biodiversity, enhancing soil health, and utilizing local resources and knowledge. Agro-ecological practices include crop diversification, organic farming, agro forestry, integrated pest management, and the use of compost and green manures. These practices are designed to work in harmony with natural ecosystems, reducing the reliance on chemical inputs and fostering ecological balance. (Hutchings, 2003).

Crop Diversification in agriculture refers to the practice of growing a variety of crops or raising different types of livestock to reduce risk and improve resilience. This strategy helps farmers mitigate the impact of adverse conditions, such as pests, diseases, or market fluctuations, and can lead to more stable income and food security (Abdimomynova, 2019).

Crop rotation is the practice of growing different types of crops in the same area in sequential seasons. It aims to improve soil health, reduce soil erosion, and decrease the build-up of pests and diseases. For example, a farmer might plant legumes one year to fix nitrogen

in the soil, followed by cereals the next year to use the available nutrients efficiently (Heichel, 1987).

Agro Forestry is a land management system that integrates trees and shrubs into agricultural landscapes. This practice combines agriculture and forestry technologies to create more diverse, productive, profitable, healthy, and sustainable land-use systems. It includes practices like alley cropping, silvo pasture, and forest farming (Leakey, 1996).

Organic farming is an agricultural method that emphasizes the use of natural processes and inputs. It avoids synthetic chemicals such as pesticides, fertilizers, and genetically modified organisms (GMOs). Instead, organic farming relies on techniques like crop rotation, green manure, composting, and biological pest control to maintain soil fertility and ecological balance (Paull, 2014).

Food security, on the other hand, refers to the availability, accessibility, and affordability of food for all people at all times. It encompasses four dimensions: food availability, economic and physical access to food, food utilization, and stability over time. The intersection of agro ecology and food security lies in the ability of sustainable farming practices to enhance food production while maintaining the health of the environment and the well-being of farming communities (Westengen & Banik, 2024).

Food Availability refers to the existence of food within a community. This is closely linked to the efficacy of food production. Availability can become an issue when there is a lack of necessary resources, such as water for irrigation or when land being used for food production is damaged or degraded (Burchi & De Muro, 2016).

Simply having enough food in a community means very little if there is poor access to it. True food security means that individuals have the resources they need to obtain a sufficient quality of nutritious food. Access to food is affected by a myriad of physical, social and policy related factors. Factors such as pricing, household proximity to suppliers, and infrastructure all affect our access to food (Caswell et al., 2013).

Not all food is of equal or sufficient value. To be food secure, it is crucial that the food being accessed is of a good quality, nutritious, and healthy enough to provide the energy people need for their daily activities. It is also crucial that individuals have the necessary

knowledge and tools to properly "utilize" the food available to them. This includes having the utilities to properly select, prepare, and store foods that are available and accessible (Kristi et al., 2022).

Good food stability means that access, availability, and utilization of food remain relatively stable over time. It is important to try to minimise any threats to this stability. Threats to food stability include natural disasters, climate change, conflict, and economic factors such as volatile price fluctuations (Fahy, 2022).

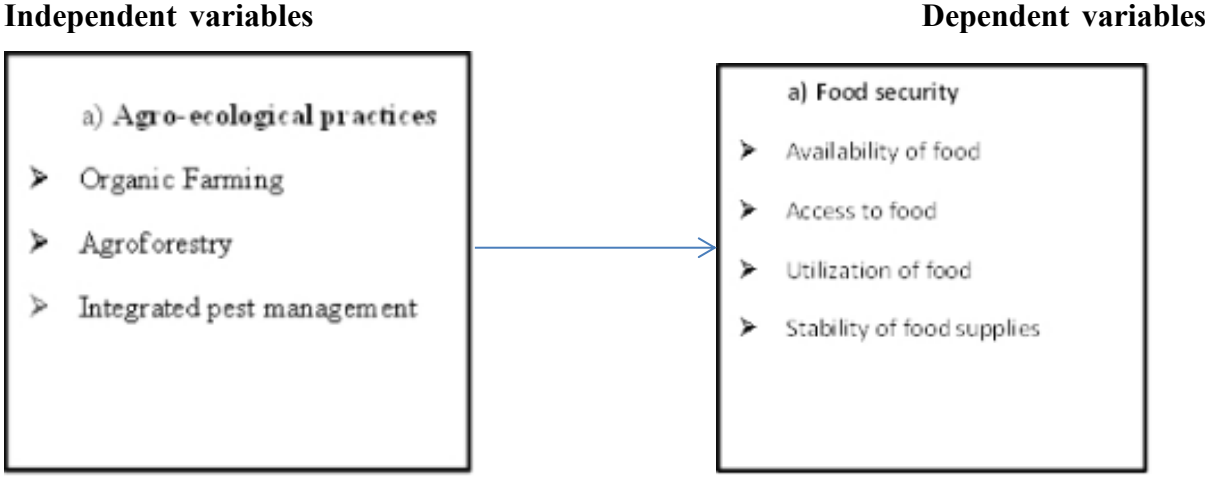


Figure 1. Shows the conceptual framework scheme

1.4 Theoretical Framework

The study is anchored on the Agro ecological theory developed by Stephen Gliessman in 1990. Gliessman and Miguel Altieri's work in the late 20th and early 21st centuries has been pivotal in defining agro-ecological principles and demonstrating their application in improving agricultural sustainability and food security. Gliessman further developed these ideas, emphasizing the importance of integrating scientific knowledge with traditional farming practices to create sustainable agricultural systems (Gliessman & Engles, 2014).

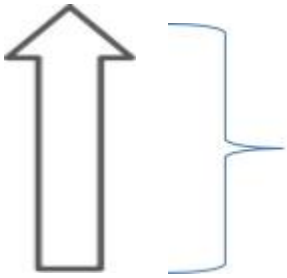
The theory was supported by the ecological theory developed by Elton in 1958. Ecological theory provides the principles of nutrient cycling, energy flow, and ecological balance, which are essential for sustainable agriculture. Charles Elton's work on the ecology of invasions and ecosystem dynamics in the mid-20th century laid the groundwork for understanding these processes.(Elton, 1927) Agro ecology applies these principles by

promoting practices like crop rotation, polycultures, and the use of natural predators for pest control, all of which enhance ecosystem services and sustainability (Gliessman, 2003).

1.5 Visionary Statement

Food security paints a situation where everyone has consistent and reliable access to the food they need. This calls for imploring better farming methods that attract higher yields. Farmers have therefore employed conventional agricultural practices that improve productivity at the expense of heavily dependent on chemical inputs and monoculture, have proven unsustainable in the long term. They contribute to soil erosion, water contamination, and a decline in soil fertility, further exacerbating the food security crisis. Additionally, these methods often benefit wealthier farmers who can afford the necessary inputs, leaving smallholder farmers at a disadvantage and widening socio-economic disparities. (Kerr, 2021). Through conducting Community Action Planning (CAP) In Matale Village, I found out that despite the use of conventional agricultural practices, food security still remains a challenge demanding innovative solutions. While conventional agriculture has increased yields, concerns regarding environmental sustainability and equitable access persist. As a result of this, we formulated a vision which requires Agro-ecological approaches, emphasizing ecological principles in agricultural practices which offer a promising alternative. The vision this research seeks to achieve, enhanced food security in Matale village by 30th Dec 2028. And this research evaluated the effectiveness of agro-ecological approaches in enhancing food security in Matale Sub-county. It aims to identify the barriers to the adoption of these practices, assess their impact on agricultural productivity, environmental sustainability, and socio-economic resilience, and provide recommendations for scaling up agro-ecological practices in the region. Addressing these issues is crucial for developing sustainable agricultural strategies that can secure food supplies and improve livelihoods.

VISION



Structural tension.

ACTION STEPS

CURRENT REALITY

ACCOUNTABLES	Vision: **Enhanced food security by 30th Dec,2028 in Matale village**	DUE-DATES
Intern and the community members	ACTION ASTEPS 3. proper post-harvest handling. 2. Implementing Integrated Pest Management (IPM), organic farming and agro-forestry to provide food and also to maintain the fertility of the soil. 1. Providing training and on sustainable farming techniques, such as crop rotation, organic farming, agro-forestry, and conservation agriculture.	 29th Dec 2028 From Jan,2025 to Dec 2028 From Sep,2024 to Oct 2024

Intern and the community members	CURRENT REALITY ➢ No knowledge and skills ➢ Have labour ➢ Have materials ➢ Have the trainer ➢ Have land ➢ Have the ability	

Figure 2. Shows structural tension chart

1.6 Purpose of the study

The purpose of this study is to establish the effect of agro ecological approaches on food security in Matale Sub County.

1.7 Research Objectives

1. To identify how demographic factors, influence farmer's choice of the agro-ecological approaches
2. To identify the extent of which agro ecological approaches are used by farmers in Matale sub-county
3. To determine the influence of agro ecological approaches on food security in Matale Sub-county

1.8 Research Questions

1. Do demographic factors influence farmer's choice of agro ecological approaches?
2. To what extent are the agro ecological approaches used by the farmers in Matale Sub County?
3. Do agro ecological approaches have any influence on food security in Matale Sub County?

1.9 Significance of the Study

The findings of the study could be significantly useful in the following ways;

Agro-ecological approaches offer sustainable alternatives to conventional farming methods, promoting practices that enhance soil fertility, conserve water, and minimize environmental degradation. By studying the effectiveness of these approaches, the research contributes to the development of farming systems that can meet the food needs of present and future generations without compromising environmental integrity.

Agro-ecological approaches are inherently resilient to climate variability and change, as they emphasize diversification, adaptation, and the use of local resources. By studying their impact on food security, the research contributes to building resilience among farming communities, helping them cope with the challenges posed by climate change and extreme weather events.

The findings of the research will have direct implications for agricultural policy formulation, development planning, and investment strategies. By providing evidence-based recommendations, the research can guide policy makers and stakeholders in promoting the adoption of agro-ecological approaches and main-streaming sustainable agriculture into development (Andrieu, 2024).

1.10 Scope of the Study

This chapter presents the content, geographical, thematic scope and time scope of the research as shown below;

1.10.1 Content Scope

The study examined the impacts of agro-ecological approaches to enhance food security in Matale Village, Matale Sub-County Kibaale District.

1.10.2 Geographical Scope

The study conducted in Matale Village, which is located in Matale Sub-county, Kibaale District which is in the Mid-Western part of Uganda. The District is bordered by Kagadi District to the West and the North, Kakumiro District and Mubende District to the East, Kyegegwa District and Kyenjojo District to the South and it is approximately 215 Kms from Kampala, the Capital City of Uganda.

1.10.3 Thematic scope

Thematically, the study explored the relationship between agro-ecological approaches and food security within the context of Matale Sub-county. It examines how agro ecological practices are adopted and implemented by smallholder farmers in response to local socio-economic, environmental, and institutional factors. Additionally, the research investigates the implications of these practices for food availability, access, utilization, and stability within the community. The study took a period of 2 months from proposal generation to final report writing and submission

1.10.4 Time Scope

The study covered a period of one month, from September 2025 to October 2025. This time-frame allows for data collection and data analysis. In the first two weeks will be data collection, the third week data analysis and the fourth week will be report writing.

2.0 CHAPTER TWO: REVIEW OF LITERATURE

2.1 Introduction

This chapter reviews current literature in line with agro-ecological approaches and food security

2.1 Ago ecological practices

Agro-ecological approaches have garnered significant attention as sustainable solutions to enhance food security. These approaches integrate ecological principles into agricultural practices, promoting biodiversity, ecosystem services, and resilience to climate change. Numerous studies highlight the effectiveness of agro-ecological methods in improving food security by increasing agricultural productivity, enhancing soil fertility, and reducing dependency on external inputs.

For instance, Altieri et al. (2015) emphasize that agro-ecological practices such as crop diversification, intercropping, and the use of organic fertilizers can lead to higher crop yields and more stable food production systems. These practices contribute to food security by ensuring a consistent and diverse supply of food, particularly in smallholder farming communities (Altieri et al., 2015).

2.2 Integrated pest management

Integrated Pest Management (IPM) is a crucial component of agro ecological approaches, aiming to control pest populations through environmentally friendly methods. IPM reduces the reliance on chemical pesticides, thereby minimizing environmental and health risks while promoting sustainable agriculture. Studies indicate that IPM can significantly enhance food security by protecting crops from pests without compromising environmental integrity.

A study by Parsa et al. (2014) found that IPM practices, including biological control, habitat manipulation, and the use of resistant crop varieties, lead to reduced pest infestations and increased crop yields. This, in turn, contributes to improved food availability and stability for farming households in regions practising IPM (Parsa et al., 2014).

2.3 Agroforestry

Agro forestry, the integration of trees and shrubs into agricultural landscapes, offers multiple benefits for food security. Trees in agro forestry systems provide fruits, nuts, and other edible products, contributing directly to food availability. Additionally, agro forestry practices improve soil health, water retention, and biodiversity, which are essential for sustainable agricultural productivity.

A study by Mbow et al. (2014) highlights the positive impact of agroforestry on food security in Sub-Saharan Africa. The research demonstrates that agroforestry systems enhance soil fertility through nitrogen fixation, organic matter addition, and erosion control. These improvements lead to higher crop yields and more resilient farming systems, ultimately contributing to food security in the region (Mbow et al., 2014).

2.4 Organic farming

Organic farming, characterized by the use of natural inputs and ecological processes, is a cornerstone of agro ecological approaches. Organic farming practices, such as composting, crop rotation, and the use of organic pest control methods, promote soil health and biodiversity. Studies show that organic farming can significantly improve food security by enhancing soil fertility, increasing crop yields, and reducing dependency on chemical inputs.

Research by Reganold and Wachter (2016) indicates that organic farming systems often yield comparable or even higher outputs than conventional systems, particularly in drought-prone areas. The study also notes that organic farming improves food quality and safety, providing nutritious and chemical-free food to consumers. These benefits contribute to food security by ensuring a reliable and healthy food supply (Reganold & Wachter, 2016).

2.5 Food Security

Food security, defined as the state in which all individuals have physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary needs and preferences for an active and healthy life, remains a critical global concern. Despite advancements in agricultural productivity, achieving universal food security is challenged by factors such as climate change, economic disparities, and political instability.

The concept of food security has evolved over time, expanding from a focus solely on food availability to encompass access, utilization, and stability. This multidimensional perspective acknowledges that sufficient food production does not automatically translate to equitable distribution or proper nutrition. For instance, a systematic literature review highlighted the complexity of measuring food security, emphasizing the need for comprehensive indicators that reflect its various dimensions and components (Elliott, 2017).

Governance plays a pivotal role in addressing food security challenges. Effective policies and institutional frameworks are essential for ensuring food availability and access. A systematic review on food security governance underscored the importance of coordinated efforts among governments, international organizations, and civil society to develop and implement strategies that enhance food security at all levels (Reis-Dennis, 2020).

Recent studies have also examined the impact of global crises, such as pandemics, on food security. A systematic literature review focusing on coping mechanisms during pandemics identified various strategies employed by individuals and households to maintain food security, as well as the policies needed to support these efforts. The review called for more research to understand the effectiveness of these strategies and to inform policy development (Erfanmanesh et al., 2019).

Furthermore, the relationship between food security and environmental sustainability has gained attention. A review exploring food security challenges emphasized the need for policies that not only address immediate food needs but also ensure the sustainability of future food production. This includes adopting practices that protect natural resources and reduce environmental degradation (Wahbeh et al., 2022).

In conclusion, achieving food security is a multifaceted challenge that requires a holistic approach, integrating considerations of availability, access, utilization, and stability. It necessitates effective governance, adaptive coping mechanisms during crises, and sustainable practices to ensure that all individuals can maintain a healthy and active life.

CHAPTER THREE: RESEARCH METHODOLOGY

3.0 Introduction

This chapter details the methodology adopted to study the efficacy of agro-ecological approaches on food security in Matale Village, Matale Sub-county, Kibaale District, Uganda. It presents discussion on the research design, Target population, Sample size, Sampling techniques, Data types and Sources, Data collection methods, Data collection instruments, Procedure, Data Analysis, interpretation and presentation

3.1 Research Design

The study involved mixed-methods research design that allows integration of qualitative and quantitative data to provide a comprehensive understanding of the efficacy of agro-ecological approaches on food security. This approach enables triangulation of data from different sources, enhancing the validity and reliability of the study findings.

Four methods of data collection were used: documentary review, questionnaire administration, in-depth interviews, and participant's observation and focus group discussions. Data was collected from three categories of participants namely; Agricultural Officers, local men, and women Focus group discussions were conducted including 47 men, and 62 women. The interviewer based on the observations made during the interviews jotted down field notes

3.2 Target population

A population is defined as a group of individuals of the same species living and interbreeding within. a given area.(Wells & Richmond, 1995) Members of a population often rely on the same resources, are subject to similar. Environmental constraints, and depend on the availability of other members to persist over time. (Tuff, 2012).The target population of 109 members including 47 men and 62 women

3.3 Sample size

According to (Hossan, 2023) sample size is defined as the number of observations used for determining the estimations of a given population. The size of the sample has been drawn from the population. Sampling is the process of selection of a subset of individuals

from the population to estimate the characteristics of the whole population. Using Solvens formula (Adebisi, 2018), the sample size of 109 participants was calculated as given below.

n= N 1+N·e2Where: n = sample size, N = total population size, e = margin of error (as a decimal) Given: N=150N = 150N=150Assume a margin of error 0.05(5%)n= 1501+150·(0.05)2

n= 150 1+150.0.0025

n= 150 1.375

n=109

Table 1. Shows categories of study population and sample size

Categories	Study population	Percentage (%)
Men	47	43
Women	62	57
Total	109	100

SOURCE: Survey 2024

3.5 Selection of sample

To ensure a balanced and representative sample, the study employed a combination of Simple Random Sampling and Purposive Sampling techniques in selecting 109 participants from Matale Village. This approach allowed for the inclusion of both general community members and key informants with specialized knowledge on agro ecological practices and food security.

Purposive Sampling refers to a group of_non-probability sampling techniques in which units are selected because they have characteristics that you need in your sample. In other words, units are selected “on purpose” in purposive sampling (Nikolopoulou, 2022). It was used to select key informants, such as agricultural extension officers, local experts, and experienced farmers, who possessed valuable insights into agro ecological approaches. The

selection process began with consultations with local leaders to identify individuals actively engaged in sustainable farming and food security initiatives. These key informants were chosen based on their expertise, experience, and direct involvement in agriculture, ensuring that the study captured detailed information on agro ecological trends, challenges, and best practices. A total of 14 key informants were selected, providing crucial qualitative data to complement the broader community responses.

On the other hand, Simple Random Sampling is a randomly selected subset of a population. In this sampling method, each member of the population has an exactly equal chance of being selected.(Thomas, 2020) was employed to select 95 general participants from the village population, ensuring that every eligible individual had an equal chance of being chosen. The process began with compiling a list of all interested community members, including farmers, youth, and household heads engaged in agriculture. Each individual was assigned a unique number, and a lottery method was used to select participants randomly. This involved placing the numbered slips into a container, thoroughly mixing them, and drawing numbers one by one until the required sample size was achieved. In some cases, a random number generator was also used to ensure fairness in selection. This method eliminated bias and ensured the study had diverse representation across different demographics, including age groups, gender categories, and economic backgrounds.

By integrating Purposive Sampling for expert insights and Simple Random Sampling for community representation, the study successfully selected 109 participants in an inclusive and systematic manner. This approach enhanced the credibility of the research findings, ensuring a comprehensive understanding of how agro ecological approaches impact food security in Matale Village.

A simple Random and purposive sampling Technique was used whereby Purposive Sampling was used to select Key informants, such as agricultural extension officers and local experts, will be selected based on their knowledge and experience with agro ecological practices.

While simple Random Sampling will be used to select a subset, of participants from a population (Golzar 2022) . This technique favours every member of the community to have a chance of being selected with no bias.

3.6 Data types and Sources

3.6.1 Primary Data

The primary data source was collected directly from the field from the sources like focus group discussions, observation, resource mapping and interviews. Here, a semi structured interview guide and an observation checklist were made according to the research objectives.

3.6.2 Secondary Data

Secondary Data was extracted from existing literature like, reports, internet and journals. With this data, document analysis was done to answer the research questions.

3.7 Data collection methods

Data collection is the process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer stated research questions, test hypotheses, and evaluate outcomes. In order to ensure reliability of the study findings, several data collection methods were used to collect data for all the objectives and they include the following;

3.6.1 Interview methods

An interview is qualitative research method of data collection that involves two or more people exchanging a series of questions and answers in order to collect data. This is a method that involved conservation between the researcher and the respondents. Easwaramoorthy & Zarinpoush, 2006) asserted that interview method is a conversation for gathering information. A research interview involves an interviewer, who coordinates the process of the conversation and asks questions and an interviewee, who responds to those questions. Unstructured interview in relation to the research questions was administered to collect information from the participants.

3.6.2 Questionnaire survey

A questionnaire survey is research method featuring a series of questions used to collect useful information from the participants. They included both written and oral questions. In this method, questionnaires were designed together with the community and

issued to the participants. They consisted of a series of questions and each question providing a number of alternative answers from which participants chose in relation to the research questions.

3.6.4 Focus Group Discussion

A focus group discussion is a qualitative research method and data collection technique in which a selected group of people discuss a given topic or issue in depth facilitated by a moderator. The focus group discussions were used to explore the efficacy of agro-ecological approaches on food security in Matale Village by bringing together a diverse group of farmers. These discussions encourage participants to share experiences, challenges, and insights on Agroforestry, integrated pest management and organic farming. The interactive format enabled to uncover a range of perspectives, providing in-depth qualitative data that complements other research methods, offering a deeper understanding of the issues affecting agro-ecology. We divided the population of 109 farmers into strata (small: 14, medium: 30, large: 65) and randomly we selected participants for FGDs for production discussion, challenges, record insights and analyse themes to understand common issues and differences across strata affecting agro ecological approaches. We used this method to gather data from different groups of farmers since this creates a deeper understanding through six focus group discussions with various stakeholders

3.6.5 Field observation

Field observation is qualitative research methodology where the researcher is immersed in the day-to-day activities so as to study the participants. Furthermore, engaging in field observations to assess soil quality, crop health, pest infestations and farming techniques first-hand was complement survey and interview data, providing context-specific observations and identifying potential discrepancies between reported and observed practices.

As research team we created time to go and interact with the farmers. This gave us insights of what was happening on the ground. At some times we stepped in the garden and observed how farming is carried out. We chose this method because it enabled us to see if farmers are doing something different from what they say that they do. It also gave us first-hand information.

3.8 Data collection instruments

The following are the instruments that we used to collect data for all the objectives;

3.8.1 Questionnaire Tool

A questionnaire research tool featuring a series of questions used to collect useful information from the respondents. This tool of data collection was used to generate and collect vast information from respondents. The tool included closed end sets of questions that were distributed to all respondents and this gave respondents convenient time to answer the questions by making choice of their own.

3.8.2 Interview Guide

According to Howlet (2024), Interview guides are the roadmap to ensure every interview conducted for a particular position is consistent and focused. It goes beyond outlining the interview questions; it should cover rules and policies, evaluation, and much more. Interview guides also document the process and give interviewers something to stay accountable to. We used unstructured interview as the tool for data collection, because it provides participants with the opportunity to fully describe their experiences. This method of data collection was chosen to allow the participants to share their own stories in their own words, rather than being forced by pre-established lines of thinking developed by the research team. The respondents included 1 agricultural officer, 11 local leaders and 2 farmer group leaders.

3.8.3 Seasonal Calendars

Seasonal calendars are visual tool used to document and represent seasonal patterns, activities, and events within a community. They create calendars that depict the timing and significance of various events, activities and natural occurrences throughout the year.

3.9 Procedure

The study commenced with formulating a topic derived from field attachment one experience using Participatory Action Research and was followed by writing a research proposal that was submitted for approval to the supervisor. Questionnaires and an interview guide were prepared, and an introductory letter was obtained from African Rural University

to introduce the researcher to Matale Village. Additionally, permission was sought from the Local Council 1 (LC1) Chairperson of Matale, who provided a letter authorizing the research team to conduct the study. With these approvals, the research team was permitted to gather data from participants. The data collected was then sorted, edited, interpreted, and analysed to derive meaning.

3.10 Data Analysis, interpretation and presentation

3.10.1 Data processing

Once the data was gathered, intern and researcher team used a computer to enter data and arrange it to come up with information.

3.10.2 Data analysis

Data analysis refers *to* a process of collecting, transforming, cleaning and modelling data with the goal of discovering the required information. (Dibekulu, 2020).The data collected was presented in tables. The data was analysed using Statistical Package for Social Scientists (SPSS) with IBM SPSS Statistics version 27

3.11 Data presentation

We presented the data by using qualitative approach that presented the data related to description form using tables. This method enabled us to summarize the results on the efficacy of agro-ecological approaches on food security in Matale Village

3.11.1 Quantitative Analysis

Analysing survey data using descriptive statistics, such as frequencies, percentages, and means quantified the prevalence and distribution of biophysical and socio-economic factors affecting agro-ecological approaches. Inferential statistics, such as correlation and regression analysis, examined relationships between variables and identify significant predictors of agro ecological approaches.

3.11.2 Qualitative Analysis

The interview transcripts and field notes were used to thematically identify recurring themes, patterns, and insights related to institutional factors, policy implications, and community perspectives on agro-ecological approaches. Coding and categorizing qualitative

data facilitated the interpretation of qualitative findings and the generation of rich descriptions.

3.12 Ethical Considerations in research

Ethics refers to the quality of research procedures, with regard to their adherence to professional, legal and social obligations to the research participants.(Rogelberg, 2004) As this research involves human participants, it was therefore necessary that the following ethical principles be adhered to;

3.12.1 Informed Consent

Prior to data collection, obtaining informed consent from participants ensured voluntary participation and respect for their autonomy.

3.12.2 Confidentiality

Ensuring the confidentiality of participants' responses and anonymizing data during analysis protected their privacy and uphold ethical standards. The purpose of the research was for academic interests and was helpful in explaining the importance of the study to the respondents.

3.12.3 Minimization of Harm

During the data collection process on the effect of agro ecological approaches on food security in Matale District, the researchers took deliberate ethical measures to ensure that participants were protected from any form of harm, whether physical, psychological, social, or emotional. To ensure anonymity and confidentiality, participants were assured that their responses would remain anonymous and that no personal identifiers would be recorded in reports or publications. Before conducting interviews or administering questionnaires, the research team provided a detailed explanation of the study’s objectives, procedures, and potential risks or benefits, ensuring participants gave informed consent voluntarily. To avoid psychological or emotional stress, the researchers framed questions respectfully and culturally sensitively, allowing participants to skip any question they were uncomfortable with. Additionally, participants experiencing distress due to discussing food insecurity challenges were referred to local support structures such as community leaders or extension officers for assistance. Lastly, the research team respected local customs and norms by

dressing appropriately, using respectful language, and providing translation services to ensure respondents felt comfortable and included in the study.

3.12.4 Discipline

The research team maintained discipline and professionalism throughout the study by collaborating with key stakeholders, respecting schedules, and adhering to research ethics. They worked closely with the Local Council 1 (LC1) Chairperson, village research teams, and technical staff to gain community trust and facilitate smooth data collection, ensuring that farmers, men, and women involved in agro ecological practices had their voices heard. Interviews and focus group discussions were scheduled at convenient times to avoid disrupting participants' daily farm or household activities, with researchers arriving on time and following agreed-upon schedules. To uphold research ethics, the team avoided bias, ensuring all viewpoints both positive and negative were recorded without manipulation, and no incentives were used to influence responses. Transparency and accountability were prioritized, as the researchers openly shared the study's purpose and addressed any concerns raised by participants while also documenting and communicating field challenges to supervisors. Lastly, professional conduct was maintained by treating all participants with respect, ensuring cultural norms were upheld, and handling any disputes calmly with the involvement of local leaders where necessary, ensuring a smooth and ethical research process.

3.13 Dissemination of findings

3.13.1 Research Report

The research findings were compiled into a comprehensive report that documented the methodology, results, and implications of the study for stakeholders, policymakers, and the academic community. The report provided a clear overview of the research process, including the study background, objectives, data collection methods, and ethical considerations. The results were systematically presented, highlighting key insights into the effect of agro ecological approaches on food security in Matale District. The implications of the findings were discussed in relation to improving agricultural practices, informing policy decisions, and guiding future research. The report served as a valuable resource for

stakeholders, including local farmers, extension officers, government agencies, and development organizations, offering practical recommendations for enhancing food security through agro ecological methods.

3.13.2 Presentations and Workshops

Organizing presentations and workshops to disseminate key findings to local communities, agricultural stakeholders, and relevant government agencies will facilitate knowledge exchange, promote dialogue, and inform evidence-based decision-making in agro-ecological approaches to improve food security and agricultural development in Matale village.

CHAPTER FOUR: PRESENTATION AND DISCUSSION OF RESULTS.

4.0 Introduction

This chapter presents response rate, presentation of findings, interpretation and discussion of the research findings in relation to the research objectives.

4.1 Demographic information of Respondents

Data on the demographic information of the respondents was collected and results were evidenced as follows;

4.1.1 Gender information

From figure 3, the majority of participants were female, making up 57% of the total sample, while males accounted for 43%. This distribution highlights a notable gender representation in the study sample, with females being more represented in the study population.

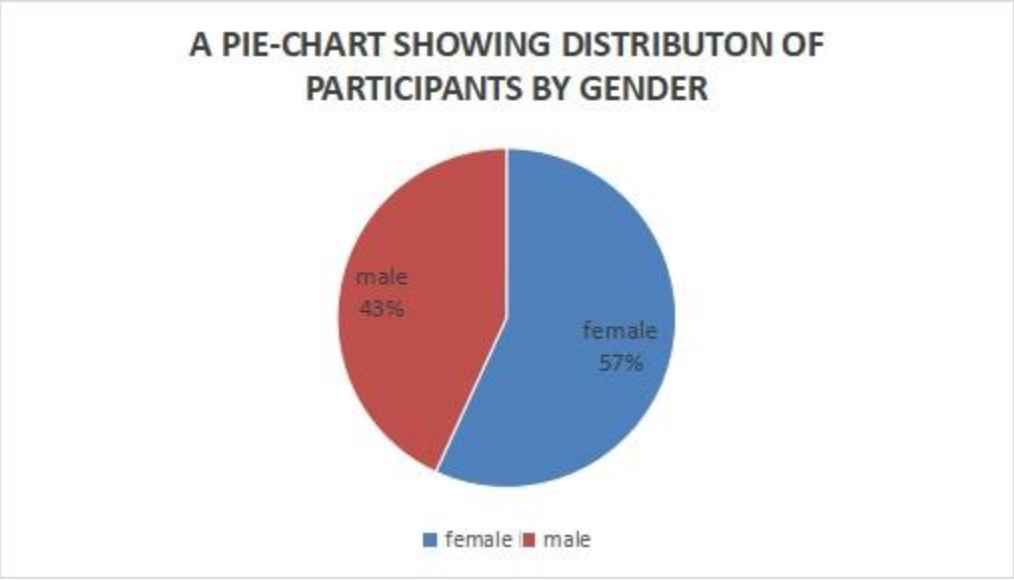


Figure 3. Shows distribution of participants by gender

The higher participation of females is significant, particularly in the context of agroecology and food security, where women often play pivotal roles. In many rural settings, women are the backbone of agricultural activities, responsible for planting, harvesting, food preparation, and resource management (Jamila, 2022). Their intimate knowledge of the land,

crops, and traditional agricultural practices makes their contributions invaluable to discussions on sustainable farming methods and food systems resilience.

4.1.2 Marital Status

From figure 4, the highest percentage of participants were **married (50%)**, highlighting the significant role of marital status in agroecology and food security, as married individuals often collaborate in farming and household activities.

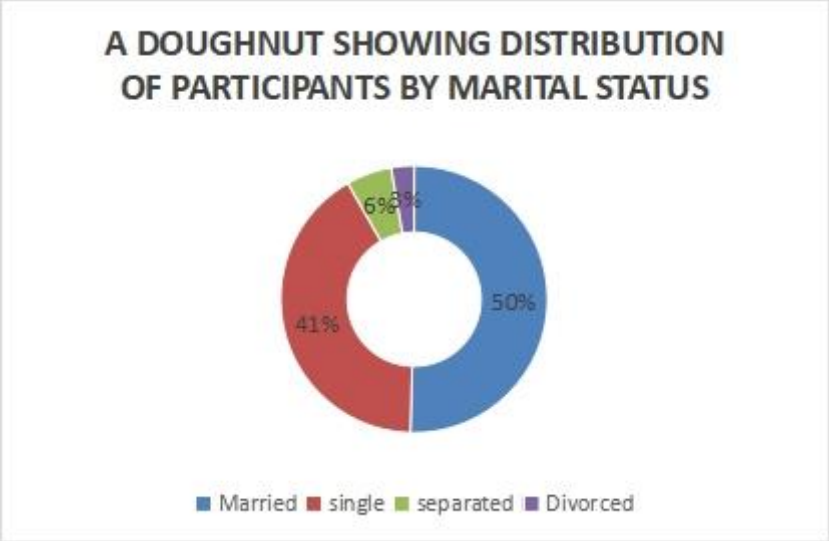


Figure 4. Shows distribution of participants by marital status

On the other hand, the **smallest percentage (3%)** comprised divorced participants, who may face unique challenges such as limited access to resources and social support, affecting their participation in agro ecological practices (Lone, 2024). Understanding these variations is essential for designing inclusive agricultural strategies that cater to different household structures.

4.1.3. Age

From figure 5, the **highest age group (51%)** comprised participants aged **18–30 years**, indicating their significant role in agricultural activities.

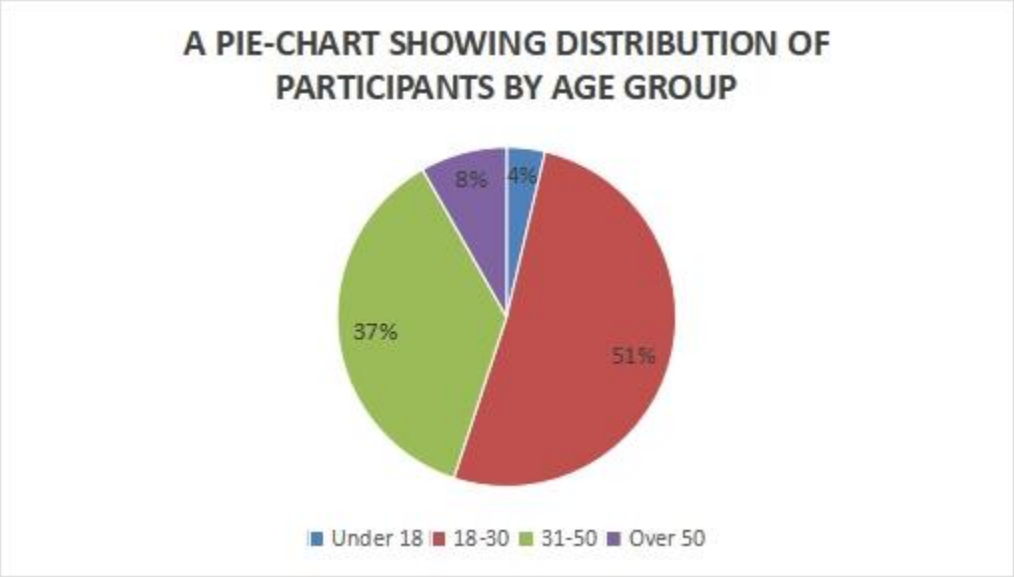


Figure 5. Shows distribution of participants by age group

This group is characterized by high energy levels, adaptability, and a willingness to embrace innovative farming techniques, contributing to both traditional and modern agricultural practices **(Eyitayo, 2025)**. In contrast, the **smallest age group (4%)** consisted of participants under 18 years, with minimal involvement in agriculture. However, this category represents the future workforce, highlighting the importance of early agricultural education and exposure. Understanding the distribution of age groups among participants is essential for developing targeted strategies that enhance productivity and ensure sustainability in the agricultural sector.

4.1.4. Education level

From figure 6, the **highest educational level attained (37%)** was O-Level, as secondary education is the most accessible form of formal education in Matale Village. However, financial constraints and household responsibilities often prevent individuals from advancing further. In contrast, the **lowest educational level (8%)** was A-Level, as many participants face difficulties transitioning from secondary school to university due to high tuition costs, limited access to higher education institutions, and the need to support their families through agricultural and household work (Israel Creleanor, 2024)

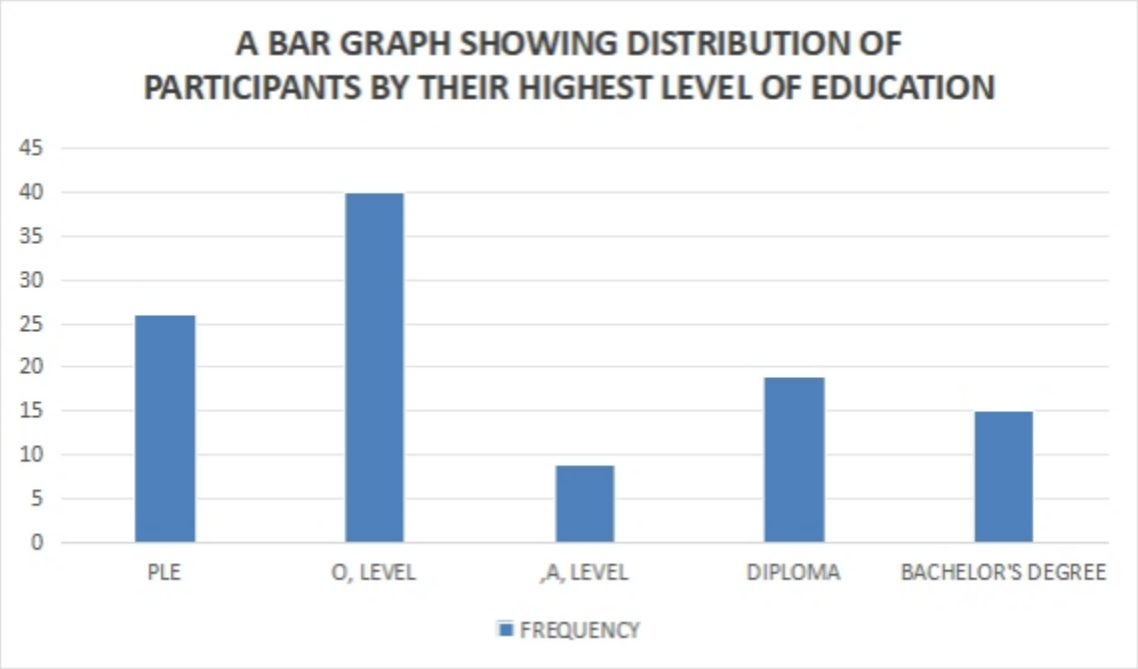


Figure 6. Shows distribution of participants by highest level of education

This disparity highlights the need for targeted educational programs that address financial and logistical barriers, ensuring greater access to higher education and skill development opportunities within the community

4.2. The extent to which agroecological approaches are used by farmers in Matale sub county

4.2.1 Integrated pest management

Table 2. Farmer's responses to use of various integrated pest management practices

IPM Practices	Agree/ strongly agree	Percentage (%)	Neutral/ undecided	Percentage (%)	Disagree /strongly disagree	Percentage (%)
Use of biological control agents	**62**	**57%**	**12**	**11%**	**35**	**32%**
Crop rotation	**85**	**78%**	**7**	**6%**	**17**	**16%**
Physical barriers (e.g., row covers)	**66**	**60%**	**15**	**14%**	**28**	**26%**

Companion planting	**55**	**50%**	**13**	**12%**	**41**	**38%**
Use of natural pesticides	**45**	**41%**	**6**	**6%**	**58**	**53%**
Natural repellents for pest deterrence	**63**	**58%**	**4**	**4%**	**42**	**38%**
Composting, green manure, organic fertilizers	**74**	**68%**	**9**	**8%**	**26**	**24%**
Selection of disease-resistant varieties	**87**	**80%**	**6**	**5%**	**16**	**15%**
maintain cleanliness in the growing area	**88**	**81%**	**4**	**4%**	**17**	**15%**

SOURCE: Survey 2024

From the table 2, Integrated Pest Management (IPM) plays a crucial role in enhancing food security by improving crop resilience, reducing pest damage, and boosting agricultural productivity. High adoption rates of practices such as field cleanliness (81%), disease-resistant varieties (80%) and crop rotation (78%) indicate their effectiveness in increasing food accessibility, while low adoption of natural pesticides reflects challenges like limited awareness and resource access. The affordability of IPM methods like crop rotation and field cleanliness aligns with food affordability for 63% of respondents, but financial constraints hinder the use of natural pesticides, contributing to food affordability issues for 37% of farmers. The moderate adoption of practices like physical barriers and natural repellents, along with gaps in access to IPM resources, mirrors the food insecurity challenges faced by 57% of respondents. Addressing these gaps through training, affordable resources, and improved distribution systems can enhance IPM adoption, improving food availability, affordability, and security. In conclusion, strengthening IPM adoption is essential to ensure sustainable agricultural practices that contribute to consistent access to nutritious food for all.

4.2.2. Agroforestry practices

Table 3. Distribution of participants who practice agroforestry on their farm

Practices	**Agree/ strongly agree**	**Percentage (%)**	**Neutral/ undecided**	**Percentage (%)**	**Disagree/ strongly disagree**	**Percentage (%)**
Integrate agroforestry practices on the farm	**81**	**74%**	**5**	**5%**	**23**	**21%**
Combine trees with pastures and livestock (silvopasture)	**75**	**69%**	**11**	**10%**	**23**	**21%**
Plant trees in rows with crops	**60**	**55%**	**10**	**9%**	**39**	**36%**

SOURCE: Survey 2024

From the table 3 above, Agroforestry (74% adoption) and silvopasture(69%) significantly enhance food security by improving accessibility, affordability, stability, and utilization. These practices boost soil fertility, conserve water, enhance biodiversity, and provide outputs like fruits, fodder, and firewood, reducing household expenses. Silvopasture integrates trees with pastures and livestock, improving pasture quality, nutrient recycling, and year-round food availability, supporting stability and affordability. However, adoption of practices like planting trees with crops remains moderate (55%), with barriers such as perceived resource competition (36%), short-term economic priorities, land constraints, and lack of technical support. Addressing these challenges through education, technical assistance, and better resource allocation can maximize the benefits of agroforestry and silvopasture in promoting sustainable food systems.

4.2.3 Organic farming

Table 4. Distribution of participants who practice organic farming on their farm

Organic farming practices	**Agree/strongly agree**	**Percentage (%)**	**Neutral/undecided**	**Percentage (%)**	**Disagree/strongly disagree**	**Percentage (%)**
Use compost manure	**72**	**66%**	**13**	**12%**	**24**	**22%**
Practice crop rotation	**86**	**79%**	**6**	**6%**	**17**	**15%**
Use of organic pesticides	**51**	**14%**	**10**	**9%**	**84**	**77%**
Green manuring	**63**	**58%**	**18**	**16%**	**28**	**26%**

SOURCE: Survey 2024

From table 4 above, Organic farming practices in Matale village, evidenced by field data, show significant contributions to food security. High adoption rates of compost manure (66%) and crop rotation (79%) enhance soil fertility, water retention, and pest resilience, ensuring stable and sustainable food production. These methods promote accessibility and affordability by reducing reliance on chemical inputs and ensuring consistent yields. Additionally, 58% of farmers recognize the environmental benefits, such as reduced pollution and improved biodiversity, which contribute to long-term stability and the availability of safe, nutritious food. However, organic pesticides adoption is low (14%) due to limited awareness Addressing these gaps through education, training, and resource support can enhance adoption, productivity, and food security by fostering more accessible, affordable, and sustainable agricultural practices

4.3 The effect of agro-ecological approaches on food security in Matale sub county

4.3.1 Access to food

From figure 7, 18% reported that food is very accessible in their region. These respondents face minimal challenges in obtaining food, 49% indicated that food is accessible. This suggests that nearly half of the respondents have a relatively good level of food accessibility, 27% stated that food is somehow accessible, indicating moderate challenges in accessing food, which might stem from factors like affordability or physical availability and 6% rated food accessibility as difficult, highlighting significant barriers to food access in their region.

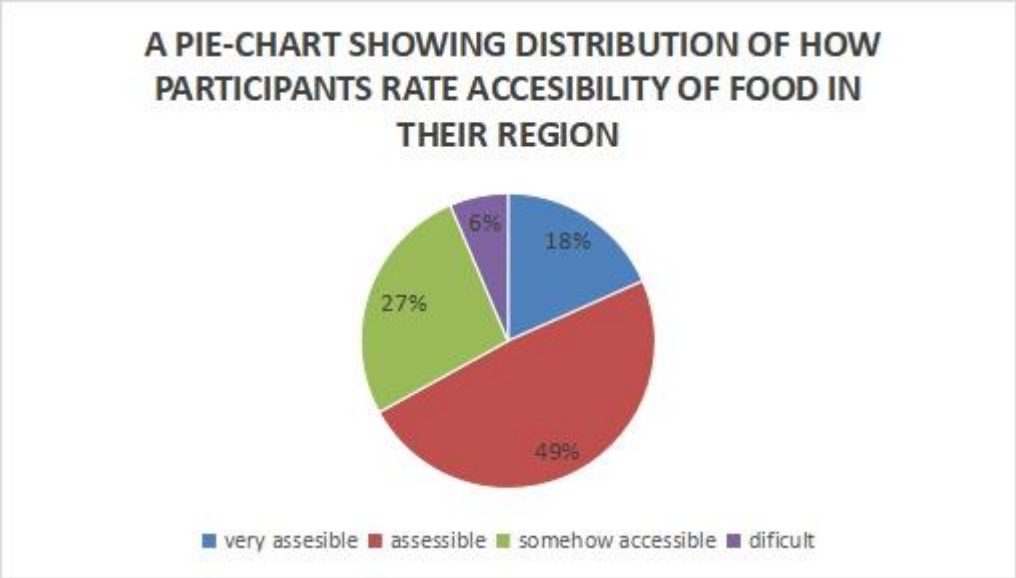


Figure 7. Shows distribution of how participants rate the accessibility of food in their region

The results demonstrate that while a majority of participants (**67%**) find food either accessible or very accessible, a substantial portion (**33%**) experiences moderate to severe difficulties in accessing food. This underscores the need for targeted strategies to address the challenges faced by the latter group, aiming to improve overall food accessibility in the region.

4.3.2 Affordability of food

From figure 8, 9% perceive food as very affordable in their region, suggesting a small proportion faces minimal financial constraints in obtaining food, A majority of 54% reported that food is affordable, indicating that more than half of the respondents find food prices manageable, 26% perceive food as somehow affordable. This group experiences moderate challenges with food affordability, likely balancing costs with other financial priorities and

11% stated that food is expensive, reflecting a minority who face significant financial difficulties in affording food in their region.

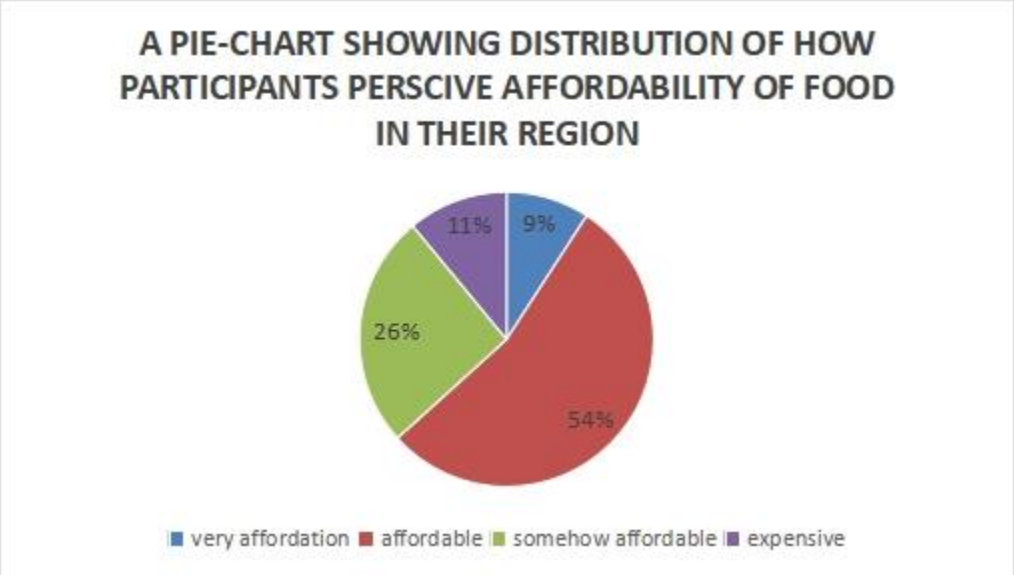


Figure 8. Shows distribution of how participants perceive affordability of food in their region

The results indicate that while 63% (very affordable and affordable) of respondents generally find food prices manageable, a significant 37% (somehow affordable and expensive) encounter varying levels of financial difficulty in affording food. This highlights the need for strategies to improve affordability for the vulnerable populations to enhance food security in the region.

4.3.3 Overall Food security status

From figure 9, 10% of the respondents perceive their region as very secure in terms of food security. This group experiences consistent access to adequate and nutritious food without significant challenges, 33% rated their region as secure. This indicates that one-third of respondents enjoy reliable access to food, though with occasional or minor challenges, 40% consider their region moderately secure. This is the largest group, reflecting a population that has food access but often faces limitations in either quantity, quality, or consistency and 17% rated their region as insecure, highlighting a significant portion of the population struggling with consistent access to sufficient and nutritious food.

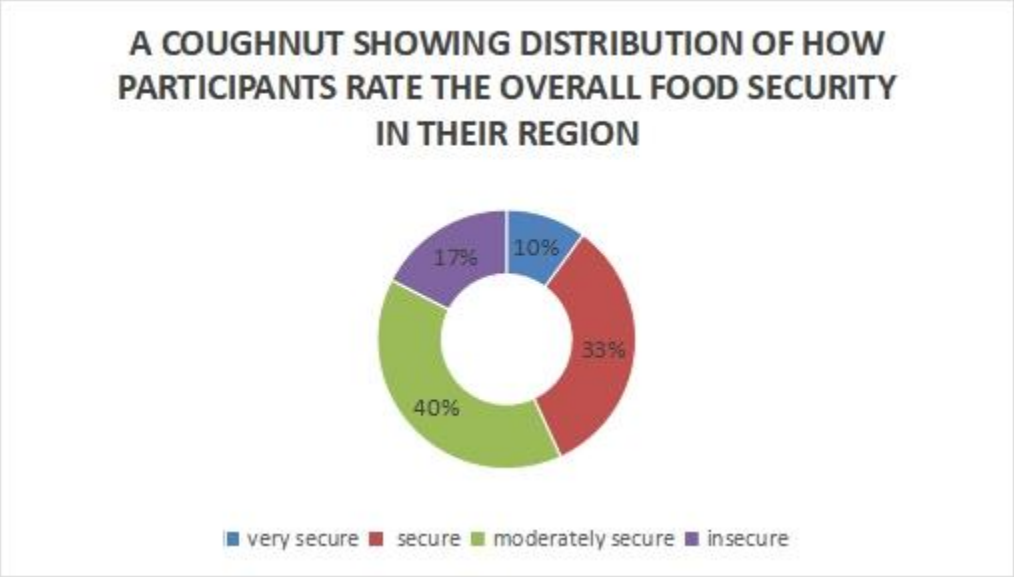


Figure 9. Shows distribution of how participants rate the overall food security in their region

The results show that while 43% (very secure and secure) of participants consider food security favourable in their region, a majority (57% moderately secure and insecure) experience varying degrees of food insecurity. These findings underscore the need for targeted interventions to address the gaps in food availability, accessibility, and affordability to improve overall food security in the region.

The primary food produced on the farms is bananas (86%), followed by cassava (14%). Bananas are a staple crop in many regions due to their high yield, relatively low input requirements, and significant nutritional value. Cassava, though less common, is also an important staple, especially in areas where it is drought-resistant and can serve as a reliable food source during periods of food scarcity. The high production of bananas underscores the crop's importance in the region's food security, while the lower emphasis on cassava highlights the need for greater diversification of staple crops to enhance food security and resilience to climate-related shocks.

4.3.4 Food utilization

From figure 11, 17% reported the nutritional quality of food in their region as very high, indicating excellent food utilization for a small portion of the population, 24% rated the nutritional quality as high, reflecting a significant proportion enjoying good nutritional standards, 43% rated the nutritional quality as moderate, suggesting average food utilization, likely meeting basic nutritional needs but with room for improvement, 15% indicated the

nutritional quality of food is low, reflecting inadequate nutrition for this group, 2% rated the nutritional quality as very low, highlighting severe deficiencies in food utilization.

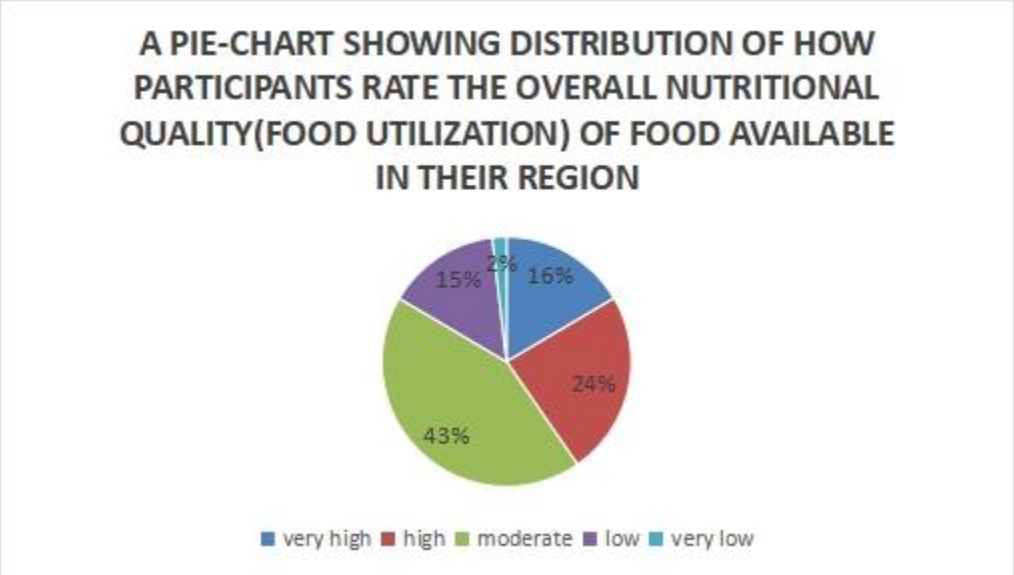


Figure 10. Shows distribution of how participants rate the overall nutritional quality of food available in their region.

The results show that 41% (very high and high) of participants consider the nutritional quality of food in their region to be favourable, whereas a majority 59% (moderate, low, and very low) experience varying degrees of nutritional inadequacy. While most respondents perceive moderate levels of nutrition, the 17% (low and very low) reflect a critical concern that requires targeted interventions to improve food quality, enhance dietary diversity, and promote better food utilization for improved health outcomes.

4.3.5 Food shortage

From figure 12, 67% reported rarely experiencing food shortages or hunger, indicating a relatively stable food situation for most individuals in the surveyed region. This group likely benefits from better food access or availability, but their food security may still be vulnerable to external factors like natural disasters, economic shocks, or political instability, 17% experience food shortages occasionally, while 12% face it often.

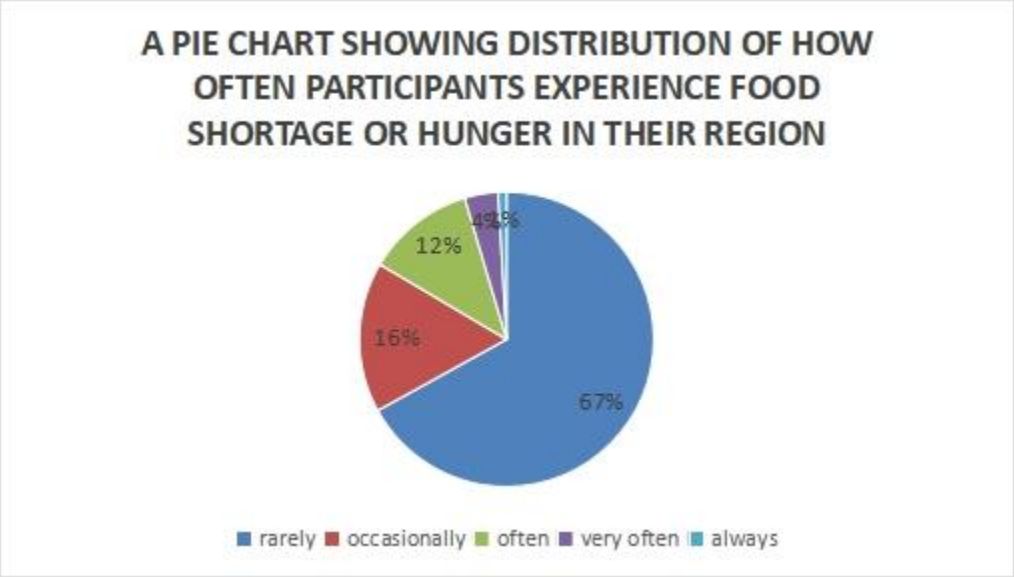


Figure 11. Shows distribution of how often participants experience food shortage in their region

These individuals represent a significant portion of the population that experiences intermittent food insecurity, likely influenced by seasonal variations, market dynamics, or limited resources for food acquisition and a smaller proportion, 4% reported very often experiencing hunger. This group is likely the most vulnerable, facing chronic food insecurity due to poverty, lack of access to productive resources, or persistent structural issues.

4.3.6 Food stability

From figure 13, 40% rated the food supply as stable, and 14% rated it as very stable, indicating that a majority (54%) perceive the food supply to be consistent and reliable over the past years. These findings suggest some level of resilience in the region's food systems, likely supported by stable agricultural production, effective food distribution networks, or favourable environmental and economic conditions, 39% described the food supply as "somehow stable," reflecting uncertainty or vulnerability in the system,

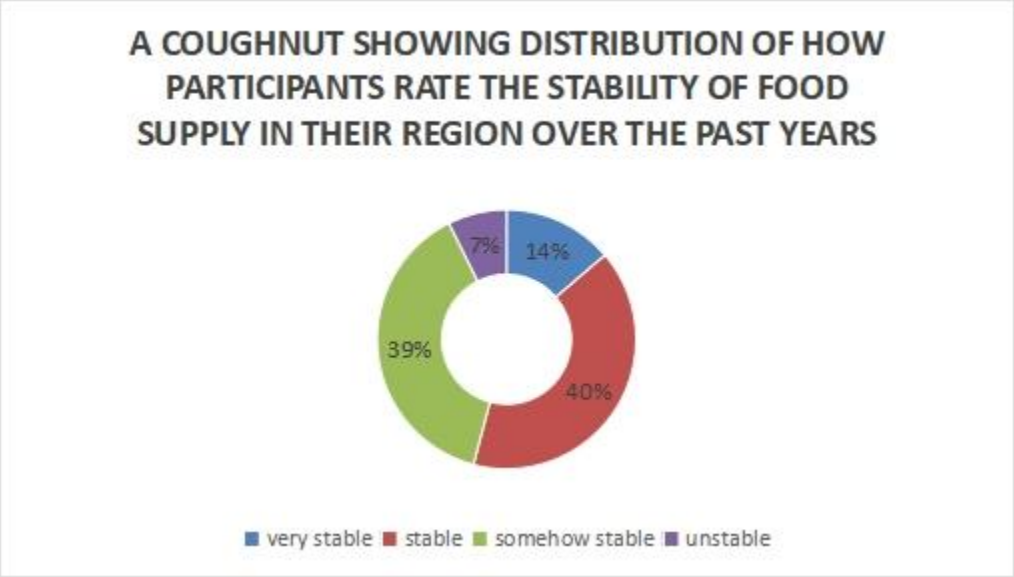


Figure 12. Shows distribution of how participants rate the stability of food supply in their region

This group likely experiences periodic disruptions in food availability or affordability due to external shocks, such as climate variability, market fluctuations, or policy inconsistencies. And 7% rated the food supply as unstable, signifying chronic challenges in food production, distribution, or accessibility. This group is likely at high risk of food insecurity and represents a critical area for intervention.

4.3.0 Responses from the Interview.

Table 5. Distribution of interview insights

QUESTIONS	RESPONSE	FREQUENCY	PERCENTAGE
What types of Integrated Pest Management do you use on your farm?	Controlled spraying	9	64%
	Hand-picking	4	28%
	Biological control	1	7%
What types of trees or shrubs are integrated into your agroforestry system?	Eucalyptus trees	10	71%
	Jackfruit trees	4	29%

Which organic farming practices do you implement on your farm?	Compost manure Farm-yard manure	11 3	79% 21%
What types of food are primarily produced on your farm?	Bananas Cassava	12 2	86% 14%

SOURCE: Survey 2024

The data (table 5) reflects the integrated pest management practices, biological control agents, agroforestry practices, organic farming approaches, and challenges faced by farmers in maintaining food security.

The majority of participants (64%) utilize controlled spraying, while only 7% practice biological control as an alternative pest management technique. The preference for controlled spraying indicates that many farmers still rely on chemical pesticides to manage pests, likely due to the perceived immediate effectiveness of these chemicals. However, the limited use of ladybirds and other natural predators suggests a gap in knowledge or resources regarding the diverse range of biological control agents available. Promoting the use of other beneficial organisms, such as ladybirds, could provide a more integrated and environmentally friendly pest management system. Given the rising concern about the long-term environmental and health impacts of chemical pesticides, there is a need to encourage greater adoption of sustainable IPM techniques, including biological controls, crop rotation, and physical pest barriers.

Majority of farmers in Matale (71%) reported integration of eucalyptus trees in their field during early stages of establishment. Eucalyptus is a fast-growing, commercially viable tree species that is valued for its timber and medicinal properties. Its popularity in agroforestry systems can be attributed to its economic benefits, as well as its ability to improve soil structure and provide windbreaks.

The predominant organic farming practice reported is the use of compost manure (79%), with fewer participants (21%) using farm-yard manure. The use of organic pesticide is still limited (14%) Compost manure is valued for its role in enriching soil fertility, improving soil structure, and promoting sustainable agricultural practices. Its widespread use highlights

the growing awareness of the benefits of organic farming among respondents. However, the use of organic pesticides is still low due to limited knowledge on making organic concoctions. Use of organic pesticides and various organic fertilizers, such as compost and farm-yard manure should be encouraged as these enhance soil health and reduce dependency on synthetic insecticides and fertilizers respectively.

In summary, the results of the interview guide indicate that farmers in the region use a combination of traditional and modern agricultural practices, with a preference for chemical pest control methods and agroforestry systems that include both eucalyptus and jackfruit trees. Organic farming practices such as composting are widely adopted, though challenges such as pest and disease pressure and unreliable rainfall persist. Bananas remain the dominant crop produced, with cassava serving as a secondary crop. These practices reflect a mix of economic and ecological considerations aimed at improving food security, but the challenges outlined indicate a need for targeted interventions to strengthen the sustainability of food systems in the region.

CHAPTER FIVE: CONCLUSION AND RECOMMENDATION OF THE STUDY FINDINGS

5.0 Introduction

This chapter presents the conclusion and recommendation to the study findings which provide important insights into the demographic composition of respondents and their implications for agroecology and food security. It also covers the limitations and areas for further study.

5.1 CONCLUSION

5.1.1 The demographic information of respondents

The study revealed that females constituted 57% of the participants, highlighting their vital role in agroecology and food security, while the majority (50%) were married, reflecting collaborative agricultural dynamics. Respondents aged 18–30 years formed the largest group (51%), emphasizing youth involvement in sustainable farming, while 37% had O-Level education, showcasing the need for tailored knowledge dissemination. This demographic diversity underscores the importance of inclusive and gender-sensitive strategies to leverage the unique contributions of all groups for sustainable agriculture and food security in Matale Village.

5.1.2 The extent to which agroecological approaches are used by farmers in Matale sub county

The study reveals that IPM practices significantly contribute to food security in Matale village. Practices such as crop rotation, maintaining cleanliness in growing areas, and using biological control agents were highly adopted, showcasing their effectiveness in pest control and crop productivity. However, low adoption of practices like natural pesticides and companion planting, and biological control highlights knowledge gaps or resource limitations. IPM practices, when effectively implemented, improve crop yields and sustainability, directly supporting food security.

The majority of farmer in Matale practice agroforestry (81%), 75% combine trees with pastures and livestock while 60% plant trees in rows with crop. 71% of the agroforestry practitioner integrate crops with eucalyptus. Agroforestry systems and silvopasture, are

widely recognized for their positive impacts on food security. These practices enhance soil fertility, increase biodiversity, and provide diversified sources of food and income. However, the lower adoption of planting trees in rows with crops highlights concerns about competition for resources and lack of technical knowledge. Agroforestry significantly improves food security by creating resilient and sustainable farming systems, but adoption barriers need to be addressed for wider implementation.

Organic farming practices such as compost manure use and crop rotation are highly adopted, demonstrating their importance in improving soil fertility and reducing dependency on chemical inputs. However, practices like use of organic pesticides have extremely low adoption rates due to challenges like limited knowledge on making organic pesticides. Organic farming has the potential to enhance food security by fostering sustainable agricultural systems, but its impact is limited by resource and knowledge gaps.

5.1.3. The effect of agro ecological approaches on food security in Matale sub county

The findings indicate that most participants (67%) consider food to be accessible or very accessible in their region, suggesting minimal barriers for the majority. However, a significant portion (33%) faces moderate to severe challenges, highlighting the need to address issues such as affordability, availability, or distribution systems to improve access for vulnerable groups.

While 63% of participants perceive food as affordable or very affordable, 37% report difficulties, reflecting varying levels of financial strain in accessing food. This demonstrates the need for economic interventions to enhance food affordability and reduce financial barriers for at-risk populations.

Only 43% of participants perceive their region as food secure or very secure, while 57% face moderate to severe food insecurity. This indicates that while some progress has been made, gaps remain in ensuring consistent access to adequate and nutritious food for all.

The data reveals that 51% of participants find food access easy or very easy, while 49% face moderate to severe difficulties. These points to uneven access, with certain groups requiring targeted support to overcome barriers.

Nutritional quality of food was rated favourably by 41% of participants, but the majority (59%) report moderate to severe inadequacies. This highlight significant gaps in dietary diversity and nutritional standards, particularly for vulnerable groups.

A majority of participants (67%) rarely experience food shortages, indicating relative stability for most households. However, 33% face occasional to frequent food shortages, underscoring the persistent vulnerability of a sizeable segment of the population.

Most participants (54%) perceive the food supply as stable or very stable, reflecting some resilience in food systems. However, 46% report instability or uncertainty, suggesting susceptibility to external shocks like climate variability, economic challenges, or market disruptions.

5. 2. Recommendation of the study

From the above findings, the study recommended the following to various stakeholders

Farmers should integrate agroecological approaches such as Integrated Pest Management (IPM), agroforestry, and organic farming techniques to enhance food security and sustainability. They should adopt IPM practices like crop rotation, planting resistant varieties, and using biological controls while incorporating agroforestry systems such as silvopasture to improve soil fertility and biodiversity. Organic farming techniques, including composting and use of organic pesticides, should be promoted to enhance soil health and reduce reliance on synthetic inputs.

The Matale Local Government should support these efforts by facilitating farmer training programs, providing technical assistance, and offering incentives such as subsidies for sustainable agricultural inputs. Policies should be enacted to promote agroforestry by distributing tree seedlings and offering guidance on optimal tree-crop integration.

Additionally, organic farming should be supported through research, demonstration farms, and access to organic markets. By implementing these recommendations, both farmers and local authorities can work together to strengthen food security, improve agricultural sustainability, and promote environmental conservation in Matale Village.

5.3. Areas for Further Research

Further research should focus on the role of local and national policies in promoting or hindering the adoption of agroecological practices and their alignment with food security goals. The factors influencing youth participation in agroecology and their potential role in driving innovation and sustainability in food production system should be studied to detail.

CHAPTER SIX: REFERENCE

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CHAPTER SEVEN: APPENDIX

7.1 Questionnaire

Hello. My name is Acio Beatrice a researcher from African Rural University.

	SECTION A: BACKGROUND INFORMATION (Tick the most appropriate)	
	Question	Response
B1	Name (optional)	…….
B2	Sex	1. Female 2. Male
B3	Marital status	1. Married 2. Single 3. Separated 4. Divorced 5. Widowed
B4	Age	1. Under 18 2. 18-30 3. 31-50 4. Over 50
B5	Level of education	1. PLE 2. 'Ó' Level 3. 'A' Level

		4. Diploma 5. Bachelor's Degree 6. Master's Degree 7. PhD				
	SECTION B: THE SOCIO-ECONOMIC PRACTICES OF THE PILOT COMMUNITIES In your assessment, indicate the extent of your agreement to the following statements (Choose between 1 and 5) 1= Strongly Disagree, 2= Disagree, 3= Neutral/ Undecided, 4= Agree, and 5= Strongly Agree					
		1	2	3	4	5
	I apply Integrated Pest Management on my farm					
B6	I use biological control agents					
B7	I practice crop rotation to manage pests?					
B8	I use physical barriers (e.g., row covers) to protect my crops from pests					
B10	**I** employ companion planting to control pests?					
B11	I use natural pesticides like garlic and hot pepper spray to manage pests					
B12	I Apply natural repellents to deter pests from feeding or laying eggs.					
B13	I apply composting, green manures, and organic fertilizers to support healthy plant growth and increase resilience to pests					
B14	**I** Select and plant disease-resistant varieties to reduce					

	susceptibility to specific pests or diseases.					
B16	**I** rotate crops to break pest life cycles and reduce pest buildup in the soil.					
B17	**I** grow plants that repel pests or attract beneficial insects to deter nematodes or basil to repel aphids.					
B18	**I** Maintain cleanliness in the growing area by removing plant debris, weeds, and other potential pest habitats to reduce pest breeding sites and disease transmission.					
B19	I implement agroforestry practices					
B20	I integrate agroforestry practices in my food production.					
B21	I Combine trees with pastures and livestock (silvopasture)					
B22	I plant Trees or shrubs in rows, with crops grown in the alleys between them on my farm					
B23	I implement organic farming practices on my farm					
B23	I use compost manure on my farm					
B24	I use organic pesticides on my farm					
B25	I use green manure on my farm					

How would you rate the accessibility of food in your region?

a) Very accessible
b) Accessible
c) Some how accessible
d) Difficult

e) Very difficult

How do you perceive the affordability of food in your region?

a) Very affordable
b) Affordable
c) Some how affordable
d) Expensive
e) Very expensive

How would you rate the overall food security in your region?

a) Very secure
b) Secure
c) Moderately secure
d) Insecure
e) Very insecure

How would you rate the ease of access to food in your region?

a) Very easy
b) Easy
c) Moderate
d) Difficult
e) Very difficulty

How would you rate the overall nutritional quality (food utilisation)of food available in your region?

a) Very high
b) High
c) Moderate
d) Low
e) Very low

How often do individuals in your region experience food shortages or hunger?

a) Rarely
b) Occasionally
c) Often
d) Very often
e) Always

How would you rate the stability of food supplies in your region over the past year?

a) Very stable
b) Stable
c) Some how stable
d) Unstable
e) Very unstable

Interview Guide

1. What types of Integrated Pest Management do you use on your farm
2. which types of biological control agents do you use?
3. What types of trees or shrubs are integrated into your agroforestry system?
4. Which organic farming practices do you implement on your farm
5. What challenges have you encountered in maintaining food security through organic farming
6. What types of food are primarily produced on your farm

END

Thank you very much for your time and valuable input.