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Appraisal of Organic Farming Practice Contribution to Rural
Households Food Security in Misraq Meskan Woreda, Gurage Zone,
South Central Ethiopia

Thesis Submitted to Addis Ababa University College of Development Studies
Center of Food Security Studies, in partial fulfillment of the requirement for the
Master of Science degree in Food security and development

By; Beza Kifle

GSE/9136/11

January, 2023
Addis Ababa, Ethiopia



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Adviser: Desalegn Yayeh (Ph. D)

January, 2023

Addis Ababa, Ethiopia

Declaration

This thesis proposal entitled “Appraisal of organic Farming Practices Contribution to Rural Households Food security in Misraq MeskanWoreda, Gurage Zone, and South Central Ethiopia” is my original work and has not been presented for MSc degree in any other University and all the references, sources, peoples, and materials used for the thesis have been properly acknowledged.

Declared By: Beza Kifle

Signature: _____

Date: _____

Place: Addis Ababa University College of Development Studies, Center for Food Security Studies

This is to certify that the above declaration made by the candidate is correct to the best of my knowledge as an advisor.

Dr. Desalegn Yayeh _____
(Advisor) Signature Date

Approval Sheet

This is to certify that the thesis proposal prepared by Beza Kifle entitled “Appraisal of organic Farming Practices Contribution to Rural Households Food security in Misraq MeskanWoreda, Gurage Zone, South Central Ethiopia” and submitted in partial fulfillment of the requirement for the degree of master of science in food security and development complies with the regulations of Addis Ababa University and meets the accepted standards concerning originality and quality.

Signed by the examining committee:

Chairman, Department

Signature

Date

Adviser

Signature

Date

Examiner

Signature

Date

Acknowledgment

I would love to thank, My GOD through him all was possible. Secondly, my sincerest appreciation and gratitude go to my advisor Dr. Desalegn A. for his valuable time, suggestions, assistance, and guidance throughout the undertaking of this thesis proposal. Last but not least, I would like to extend my deepest love, respect, and appreciation to my husband, family, and friends for their support, understanding, and encouragement throughout this thesis proposal.

Abbreviations

FAO	Food and Agriculture Organization
FGD	Focus Group Discussion
GDP	Gross Domestic Product
GHI	Global Hunger Index
GWF	Green Way Farm
HRD	Human Resources Development
IPM	Integrated Pest Management
SNNPR	Southern Nation Nationalities Peoples of Ethiopia
SPSS	Statistical Package for the Social Science
TOL	Tolerance
VIF	Variation Inflation Factor
WHO	World Health Organization

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Abstract

The major purpose of this study is to assess rural households' organic farming practices' contribution to household food security in Misraq Meskan woreda. The research design is descriptive research design. To determine a representative sample size from the Misraq Mesqan woreda, the researcher uses a sample size determination formula given by Yamane (1967, 886) as cited in Glein D. (2013) $n = N / (1 + Ne^2)$, $n=390$ The validity was confirmed by the experts and reliability checked on 50 respondent's answers before the questioner was disseminated in full scale by 0.820 cornbach alpha value. The research tool used are questionnaires, interview, focus group discussion and related literatures and available website used. For qualitative data analysis the data sources were from key informant interview, questionnaires', focus group discussions, for quantitative data, the data sources are from mesqan woreda administration, selected kebeles adminstration in misraq mesqan woreda, and related literatures used. Qualitative data are analyzed by SPSS, and regression analysis applied. To summarize the sample and to reach to conclusion Descriptive and inferential statistical methods applied. Organic farming practice has a positive contribution to household food security, investing in organic farming practice training, among other strategies, is an important long-term strategy to fight food insecurity and also agriculture extension workers to train the farmers on how to prepare and apply the organic products make a big difference on farmers production system and also capacity-building programs about organic farming practice help the farmers to develop their indigenous knowledge.

Key words: *Food security, Organic farming, Indigenous knowledge*

CHAPTER ONE

1. INTRODUCTION

1.1. Background of the study

Organic farming is a production management system excluding off all synthetic off farm inputs but rely up on farm agronomic, biological and mechanical methods like crop rotations, crop residue, animal manure, off farm organic waste, mineral grade rock additives and biological system of nutrient mobilization and plant protection, etc. which promotes and enhance biodiversity, biological cycles and agro ecosystem health. (Meena et al.,2013).

Currently, organic agriculture is commercially practiced in 120 countries, representing 31million hectare of certified croplands and pastures and 62 million ha of certified wild Lands for organic collection of bamboo shoots, wild berries, mushrooms and nuts (willer and yousefi, 2007). Although it is difficult to quantify, the non-certified organic system for examples , indigenous knowledge that follow organic principles by intent or by default of several million small farmers may represent at least an equivalent share in subsistence agriculture of developing countries.

The organic farming system involves three phases such as the conversion of land the from conventional management system to organic management, management of the entire surrounding system to ensure biodiversity and sustainability of the system, a crop production with alternative source of nutrients such as by crop rotation, residue management, organic manures, and biological inputs, management of weeds and pests by better management practice, maintenance of livestock in cycle with organic concept and make them an integral part of the entire system. In the social aspect, organic agriculture Organic farming shows an significant role in employment in rural areas because of the appointment of more seasonal worker, given the increases in organic food sales, however, opportunities are likely to continue in the jobs related to organic foods. Organic farming promotes entrepreneurship and decreases immigration in rural areas, thus, it enables new and different groups in the society to be involved in agricultural activities and will help to improve employment. , organic farming recognizes the value of indigenous and traditional knowledge and combines indigenous knowledge with production procedures which enhances social capacity while empowering farmers and local communities, which is consistent with achieving food security (Azadi et al.,2010).

In the economic dimension, organic farming is a sustainable option for small farmers to improve food security and enhance the overall performance of farm income, and it can be said that an increase in household income can increase food security. Organic farming reduces input costs besides the increase of the standards of living of small and marginal farmers (Peramaiyan, P et al.2011). Organic farming is cost-effective for farmers due to the lack of usage of chemicals (due to its expensive price), turning to inexpensive methods, such as biological resources rather than chemical fertilizers and pesticides. In the environmental dimension, organic farming improves soil quality, secures farm futures, and offers environmental protection. The fertile soil leads to stability and is effective in the production cycle. More nutrients given to the soil result in less soil erosion and increase soil biodiversity, which improves food security in the long term.

In Ethiopia, farmers are practicing different farming practices such as conventional farming practices and Organic fertilizers, composting, crop rotation, intercropping, mulching, and agroforestry, and so depending on different geographical locations farmers practice different organic farming practices to secure their food security and also to sustain their lives. Depending on their geographical location and setting farmers are practicing different organic farming in addition to their local knowledge they perform local innovations to prevent pests and disease, in the field and also in stock by using locally available botanicals by making some simple processes and they are truly getting the good result by this practice.

In Misraq Meskan woreda, Gurage zone crop and livestock production are the major agricultural practices both genders are involved in the farming system starting from seeding to Post-harvesting and marketing. Women play a gre0at role in the processing and marketing of livestock products the tasks will vary according to the crop grown. The farmers in Misraq Meskan woreda are practicing different best organic farming practices i.e. composting, application of organic fertilizers and pesticides, mixed Farming system, nutrient recycling, etc. To grow different crops and sustain their lives (Robertet al., 1992).

This area is of utmost importance to see the impact of organic farming Practices on a rural household food security within the woreda, the consumption and management of natural resources, and their sustainability usage.

Statement of the Problem

Ethiopia faces a high level of food insecurity. According to the Global Hunger Index (GHI), Ethiopia ranks 90th out of 116 countries and ranks among the world's hungriest (G.H.index,2021) Furthermore, according to United Nations report, around 22 million people will be in need of food aid in 2022 (G. Humanitarian,2021).

Rural areas today particularly face food insecurity for a variety of reasons, including rapid population growth, low agricultural productivity, lack of sustainable food security policies, macroeconomic instability, and rapid fluctuations in the prices of agricultural products (A. Ahmadi.etal, 2021).

Agriculture faces many challenges. In both public discourse and the scientific literature debates about the future are increasing framed in terms of 'alternative' versus 'conventional' agriculture. the category conventional agriculture has little analytical purchase, and that its use is part of a strategy of homogenising, normalising and othering. In effect, the term conventional agriculture has been weaponised. This helps explain the sterile and unproductive nature of much debate about future agricultures. A more productive approach is to focus on where and how different farming systems can contribute to the sustainability of agriculture (James S. etal 2022)

Other studies in the area Zelalem .k (2014) suggests that in the proportion of food insecure households (84.91%) is higher than the foodsecure (15.01%) households in the year during which the data was collected. According to descriptive statistics of the sample farm households, the averages of variables such as household size were found higher with food insecure households than the food secure households. On the other hand, the food secure households have relatively greater averages on the farm land size, educational level of the head, number of livestock and number of oxen than food insecure households. In addition, it was found that fertilizer user households were better food secure as compared to their counterpart households. Similarly, it was found out that large family size has high influence in worsening the food insecurity status of households. From this it is possible to conclude that households with greater household size are more likely to be food insecure as compared with households with smaller household size.

Use of agricultural inputs that are used to improve productivity such as improved seeds and fertilizer is limited in the farm households as the utilization of such inputs requires the availability of financial capital. Therefore, given the poor productivity potential of the soil and poor agricultural management practices in the study area, the production obtained from such degraded lands could not sustain the food requirements in many farm households.

Green way farms is a team that is passionate about addressing poverty and climate change to sustainable small farm agriculture. Small holder farmers have a global competitive advantage in producing organic crops using environmentally sustainable technical they need is the right support. Green path provide this support in three key ways partner with small holder farmers training permaculture, Farmer service center, by providing high value seedling crops, and the last one is premium market, purchasing the organic produce from the partner farmers weekly. The company gets working place in Butajira, misraq mesqan woreda and clutches some small holder farmers in the woreda.

The three study kebeles named Yetebon, Beresa, and shirshira Bido are the parts of kebeles in the woreda gathered under green way farm. Those kebeles are applying organic farming practice. Like other kebeles and woredas the agricultural system is rain feed agriculture system. The irrigation system is very limited in the study area. The farmers in the study area are applying organic farming inputs in their farm and the research deals the contribution of organic farming application in their household food security. From the conventional farmers response is challenges beside in using organic inputs are the availability of organic inputs to cover all the farm land and its affordability, besides if the farmers are prepared the time, skill to get enough amount for their fields. In the study area the farmers are planting different kind of crops, green beans, Avocado, coffee, Herbs, such as, lemongrass, Mint, Lavender etc.

The study gives direction and insight for the smallholder farmers to apply organic farming practices in their field, to improve their production and to keep their soil healthy.

1.2. Objectives of the study

1.2.1. General Objective

This study is designed to assess rural households' organic farming practices' contribution to food security in Misraq Meskan woreda.

1.2.2. Specific Objective

Specifically, the research intended:

- To Analyze organic farming practices in the study area,
- To Determine food security situation of rural households
- To Examine the contribution of organic farming to household food security

1.3. Research Question

The study tries to answer the following questions

- What are the organic farming practices undertaken in the study area?
- How do agricultural inputs impacts on household food security?
- How do organic farming practices improve household food security?

1.4. Significance of the study

This study plays a huge role in increasing awareness of the organic farming practice for the smallholder farmers and creates enthusiasm for the farmers to practice organic farming systems to improve their farming system, to enhance their productivity by using locally available assets in their round. Farmers by nature believe what they saw not somebody's thoughts, therefore, experience sharing by the farmers who are familiar with organic farming practices will help the other farmers to start the process. It also points out the contribution of organic farming practices to household food security.

This study address organic farming practices in the area, determine the food security situation of rural households practicing organic farming and describe rural households' food coping strategies. The research is help full to share the organic farming practice and also address the smallholder farmers, and poor farmers to be aware of organic farming practices and to improve their household food security, to use natural resources wisely and sustainably, the study also helps for the woreda agriculture office , to have the data on what kind of organic farming practices undertaken in the selected kekeles and direct the woreda for the next step on how to motivate other farmers in the study area and also community farmers by assigning skilled agriculture extension workers. This study benefits outsiders who are interested in this area for future study.

1.5. Scope of the study

The study focused on assessing the organic farming practices contribution for rural household food security , and the copping strategies of the household in the study kebeles, the study covered three kebeless named yetebon, Beresa, and Shirshira Bido, from this three kebeles 390 households were selected.

1.6. Limitation of the study

The research cover only the three kebeles of Misraq Meskan Woreda, Gurage Zone, South Central Ethiopia, and it addresses the organic farming practice's contribution to household food security. Because of time and financial shortage, the research did not compare the food security situation of a household between farmers applying organic farming practice with farmers applying conventional farming practice in the same woreda.

The major challenge the researcher faced was the shortage of time, and to get the data from the wereda administration about the three study kebeles. Despite all this challenges, the researcher do the best to compile the research with all the correct reliable and correct data.

CHAPTER TWO

2. LITERATURE REVIEW

2.1. Introduction

In this chapter, relevant literature to the theme of the study has been reviewed. It presents concept definitions, organic farming practice, and literature of different various scholars on organic farming practices to food security. The literature reviews how organic farming practices contribute to rural household food security, agricultural inputs, opportunities, and constraints of organic agriculture in Ethiopia discussed.

2.2. Concepts of organic farming

Organic agriculture is an integrated production management system which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles and soil biological activity (FAO/WHO Codex Alimentarius Commission, 2007).

Organic farming (OF) was established in 1972. Today it is practiced in more than 120 countries all around the world. The International Federation of Organic Agriculture Movements (IFOAM) defines Organic Agriculture (OA) as a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. OA combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved. Organic production is therefore not simply the avoidance of chemical inputs, as applied in conventional agriculture, or the substitution of these inputs by natural components. It is a practice which emphasizes the systems overall health by implementing a wide range of strategies and management practices in order to develop and maintain biological diversity, soil fertility and the overall agro-ecosystem stability (Svane B etal, 2020).

Organic farming is not the paradigm for sustainable agriculture and food security, but smart combinations of organic and conventional methods could contribute toward sustainable productivity increases in global agriculture (Eva,. etal 2018). The growing demand is mainly attributable to consumer concerns about negative implications of conventional agriculture for human health and the environment. Especially in developed countries, most consumers consider

organic food to be safer and healthier than conventionally produced food (Funk & Kennedy 2016).

The goal of organic agriculture is to contribute to the enhancement of sustainability. In the context of agriculture, sustainability refers to the successful management of agricultural resources to satisfy human needs while at the same time maintaining or enhancing the quality of the environment and conserving natural resources for future generations. Sustainability in organic farming must therefore be seen in a holistic sense, which includes ecological, economic and social aspects. The organic agriculture techniques are known to be by Improving soil structure and fertility through the use of crop rotations, organic manure, mulches and the use of fodder legumes for adding nitrogen to the soil fertility cycle, Prevention of soil erosion and compaction by protecting the soil planting mixed and relay crops. Promotion of biological diversity through the use of natural pest controls (e.g. biological control, plants with pest control properties) rather than synthetic pesticides which, when misused, are known to kill beneficial organisms (e.g. natural parasites of pests, bees, earthworms), cause pest resistance, and often pollute water and land. Performing crop rotations, which encourage a diversity of food crops, fodder and under-utilized plants; this, in addition to improving overall farm production and fertility, may assist the on farm conservation of plant genetic resources. Recycling the nutrients by using crop residues (straws, stovers and other non-edible parts) either directly as compost and mulch or through livestock as farmyard manure. Using renewable energies, by integration of livestock, tree crops and on farm forestry into the system. This adds income through organic meat, eggs and dairy products, as well as draught animal power. Tree crops and on-farm forestry integrated into the system provide food, income, fuel and wood (Nadia et al, 2015).

Organic farming is based on increasing crop diversity and organic farming is the backbone of healthy nutrition for humans and animals. Crop diversity is reducing pest, disease and weed pressure and helps to balance extreme weather events it aims at enriching biodiversity in order to increase root biomass and reduce evapotranspiration for increased natural soil fertility, increases economic well-being by adapting to climate change, maintaining and increasing agro biodiversity and often productivity of farms and households and offers premium prices through certification and source marketing (sven.B et al,2020).

Conventional farming system: The term “conventional” is widely applied to a range of modern management systems and as such, its exact meaning varies across studies. We take “conventional” to mean any non-organic farming system, characteristic of a particular farming region where a study took place, and that relies on external inputs to achieve high yields. “Conventional agriculture” generally refers to any agricultural system in which chemical inputs are used. Conventional agriculture may at present have high external inputs in industrialized countries and low external inputs in developing countries, but it does not rule out any external inputs that may be beneficial for its productivity (James .S etal 2022).

2.3. Organic Farming Practices

2.3.1. Composting

Compost is the product of the controlled biological decomposition of organic materials. More specifically, compost is the stable, humus-like product resulting from the biological decomposition of organic matter under controlled conditions. Composting is a microbial-driven process. Like other living creatures, microbes need the right environment to survive and thrive. For successful composting, microbes need nutritious “food”; suitable moisture, pH, and temperature; and oxygen. (L. Chen etal 2011).

Vermicompost is other way of decomposing organic material by the application of vermis. Vermicompost is considered as a high-nutrient biofertilizer with diverse microbial communities, it plays a major role in improving growth and yield of different field crops, vegetables, flower and fruit crops(k. Pill etal 2019). Other type of composting is vermicomposting, it is one way of waste management. Vermicomposting is considered as a high nutrient biofertilizer with diverse microbial communities, it plays a major role in improving growth and yield of different field crops, vegetables, and flower and fruit crops. Vermicomposting is the process of conversion of organic wastes into finely degraded peat like substances using earthworms (kiran et al 2019).

Composted organic material is being applied on agricultural fields as an amendment to provide nutrients and also to enhance the organic matter content and improve the soil properties of the cultivated soils (Mohammed et al., 2004). Compost application generally influences soil structure in a beneficial way by lowering soil density due to the mixture of low-density organic matter into the mineral soil fraction (Brown and Cotton, 2011). This positive effect has been detected in most cases and it is typically associated with an increase in porosity because of the

interactions between organic and inorganic fractions (Amlinger et al., 2007). They can increase organic matter content, especially in sandy soils, which have low water and nutrient-holding capacity (Laila, 2009).

In the study area, the farmers use farm waste and animal manure to the farm. Most of the farmers apply the animal manure directly to their farm. For the farm waste they make compost. First, they collect the farm waste and after getting enough amount they will cover the farm waste by plastic and drops water daily gradually and daily they will return the waste by 2 days difference and control the temperature by giving good aeration in the wates. And then after three weeks they get the expected result.

Then after they having the desired product the will apply for their farm and having a great impact in quality and quantity.

2.3.2. Biofertilizer

Biofertilizers are low cost, renewable sources of plant nutrients which supplement chemical fertilizers. Biofertilizer is one of the best modern tools for agriculture. Use of Biofertilizer is one of the important components of integrated nutrient management, as they are cost effective and renewable sources of plant nutrients to supplement the chemical fertilizers for sustainable agriculture (k.kumar et al., 2020.).

Many biotic and abiotic factors affect agriculture production worldwide. Biofertilisers of microbial origin can be a good option for sustaining productivity with more environment-friendly and integrated nutrient management approach. They have been advanced to use the naturally occurring nutrient mobility mechanisms, which promotes soil fertility and results in improved crop production (B Singh et al 2020). The implication of bio fertilizer retains the soil's micro and macronutrients with the help of solubilisation of phosphate or potassium, fixation of nitrogen, antibiotic production, the liberation of plant growth regulating substances and performing biodegradation of organic matter present in soil (Ansari M W etal 2014).

Some of the advantages associated with bio fertilizers include: They are eco- friendly as well as cost effective, their use leads to soil enrichment and the quality of the soil improves with time. Though they do not show immediate results, but the results shown over time are spectacular.

These fertilizers harness atmospheric nitrogen and make it directly available to the plants. They increase the phosphorous content of the soil by solubilizing and releasing unavailable phosphorous. Biofertilizers improve root proliferation due to the release of growth promoting hormones. Microorganism converts complex nutrients into simple nutrients for the availability of the plants. Biofertilizer contains microorganisms which promote the adequate supply of nutrients to the host plants and ensure their proper development of growth and regulation in their physiology. They help in increasing the crop yield by 10-25%. Biofertilizers can also protect plants from soil born diseases to a certain degree (Narendra k. etal, 2017).

In the study area the farmers use ginger and garlic in addition to the organic fabric products they mashe the ginger and garlic by machine which is available by the company and then they will mix the mashed garlic and ginger to the water and the juice will stay for three to four days and then they will splash to their farm during the first stage of sowing, sometimes they will mix the seed with the juice before sowing. And when there is some insect observed in the field farmers apply the juice and control them. By this application the farmers are getting improved products.

2.3.3. Animal Manure

Organic manure is generally categorized into bulky and concentrated organic manures (Santhoshkumar et al., 2017; Migliorini & Wezel, 2017). Compost is decomposed organic matter, such as crop residues and/or animal manure. Organic materials such as farmyard manure, biogas slurry, and compost, straw or other crop residues, bio-fertilizers, green manures, and cover crops can substitute for inorganic fertilizers to maintain the environmental quality. Liquid or solid waste from animals such as pigs, cattle, horses and goats can be applied to soils in the most diverse farming systems.

The amount of waste to be applied can be established based on the percentage of dry matter, on nutrient concentration, and by the efficiency index, which is related to the total amount of nutrients contained in the waste that can be transformed from organic form to mineral form after its application in the soil (CQFS-RS/SC, 2016).

Animal waste or other organic waste can be used as a single or complementary organic nutrient source to annual and perennial crops (Oliveira et al., 1993; Ciancio et al., 2014). Application of organic manures from sheep, goat and cattles can help to enhance the organic nutrients and

minerals in the soil. Applications of animal waste tend to increase the availability of nutrients in soils, especially N, P, K, Ca, Mg, which can stimulate plant root growth and, as a consequence, a larger volume of soil may be exploited, which favors the absorption of water and nutrients, reflected in increased production (Ceretta et al., 2005; Chantigny et al., 2008; Ciancio et al., 2014).

Farmers are applying the animal manure to their farm directly daily after collecting mostly for enset farms, for the rest of crops they used the organic fabric products supplied by the company.

2.3.4. Intercropping and crop rotation

Crop rotation is the production of different economically important plant species in recurrent succession on a particular field or group of fields (Bruns 2012). Crop rotation means changing the type of crop grown on a particular piece of land from year to year. Crop rotation is one of the most effective agricultural control strategies. Crop rotation is one of the most effective agricultural control strategies. It involves the arrangement of crops planted on same field; the succeeding crops should belong to different families (Huang et al. 2003).

An **intercropping** agriculture system is the cultivation of two or more crops simultaneously on the same field. The most common goal of intercropping is to produce a greater yield on a given piece of land by making use of resources or ecological processes that would otherwise not be utilized by a single crop. Intercropping is a cultural practice in integrated pest management (IPM) systems involving the growing of different crops in the same field.

Intercropping has the objectives to Improve food diversity, food security, biodiversity, the agro-ecological system, soil fertility, organic material due to intercropping with legume crops which will increase natural nitrogen resulting from the decomposition of the nitrogen nodes and maximize agricultural yields and improves farmers income.

In the study area the farmers intercrop different crops such as avocado with different herbs such as mint , lavender, rosemary and teff with tomato also applicable in the area.

2.4. Organic Farming Practice in Ethiopia

Ethiopia is a land-locked country known as 'Horn of Africa'. It has diversified topography, encompassing mountains over 4000 m above mean sea level, high plateaus, deep gorges cut by rivers and arid lowlands. The mean annual rainfall is highest (above 2700 mm) in the southwestern highlands and lowest in the northeastern lowlands (100 mm) (Ininda and Befekadu, 1987).

Ethiopia is one of the least developed countries in the world and its economy is based mainly on agriculture (Bekalo and Bangay, 2001). It accounts for more than 75 percent of total exports and about 45 percent of its GDP (gross domestic product) (UNDP, 1992). Coffee alone makes up to more than 87 percent of the total agricultural exports (UNDP, 1992). The UNDP has put Ethiopia at 170th rank out of the 175 countries in terms of its development index on HRD (Human Resources Development) scale (HDR, 2004; UNDP, 1992).

Organic farming is the way to sustainable development for a developing country like Ethiopia. The Ethiopian government may also capture the international market of organic products and hence earn more foreign exchange by exporting organic products to even developed countries like USA, Japan, European countries and other neighboring countries (Rani.D. et al., 2007).

With this regard, the farmers in Ethiopia experiencing different kinds of organic farming practices such as composting, Bio fertilizer, Bio pesticide, Biogas, Intercropping, crop rotation and so on. In other ways the government of Ethiopia gives permit for international investors to hold a land and to produce an organic products, this will help the country to have foreign currency, to improve farmers life in many ways and to use the natural resource wisely and to keep the environment safe.

2.5. Agricultural input impact on household food security

Most smallholder farmers in developing countries are subsistence-oriented, cultivating food crops mainly for household consumption and growing a small proportion of cash crops to meet non-food household needs. Furthermore, 75 percent of rural people in developing countries are poor and food insecure, and therefore, improvement of agricultural production is the main strategy to reduce rural poverty and food insecurity (World Bank, 2007). Among several factors that impede such a livelihood strategy is the low use of improved farm inputs in crop production, especially fertilizer and hybrid seeds (Morris et al., 2007).

Druilhe and Barreiro-Hurle (2012) argue that with low household incomes and limited income sources most smallholder farmers, especially in Africa, are unable to self-finance the purchase of adequate improved farm inputs to produce enough food and cash crops to meet household food and income security requirements.

The Role of Organic Farming in Improving Food Security

2.5.1. Social dimension

Organic farming requires more compact work and has the potential to contribute to long-term employment in rural areas. Organic farming plays an important role in employment in rural areas because of the hiring of more seasonal workers and, given the increases in organic food sales, however, opportunities are likely to continue in the occupations related to organic foods. Organic farming promotes entrepreneurship and decreases immigration in rural areas, thus, it enables new and different groups in the society to be involved in agricultural activities and will help to improve employment. Additionally, organic farming recognizes the value of indigenous and traditional knowledge and combines indigenous knowledge with production procedures which enhances social capacity while empowering farmers and local communities, which is consistent with achieving food security (FAO, February 2016).

2.5.2. Economic dimension

Organic farming is a sustainable option for small farmers to improve food security and to enhance the overall performance of farm income, and it can be said that an increase in household

income can increase food security. Organic farming reduces input costs besides the increase of the standards of living of small and marginal farmers (Peramaiyan et al., 2011).

2.5.3. **Environmental dimension**

Organic farming improves soil quality, secures farm futures, and offers environmental protection. The fertile soil leads to stability and is effective in the production cycle. More nutrients given to the soil result in less soil erosion and increase soil biodiversity, which improves food security in the long term (Najafabadi, 2014). Additionally, in organic farming with minimum tillage, biological fertilizers, proper crop rotation, cover crops, green manure, etc., an increase in soil fertility occurs (Dastenaii, 2010). Organic farming enhances food security by improving resistance to diseases and pests, combating desertification by reducing soil erosion and protecting water resources, and maintaining and improving environmental services. Avoiding chemical residues and pesticides and consuming fresh products, acquiring healthy diets, and taking advantage of the nutritional value of organic products are among other motivations that improve food security (Asadullah, 2014).

2.6. Conceptual Framework

Organic farming practices play a great role in enhancing the soil quality, improves the soil water holding capacity and improve the nutrients in the soil , therefore organic inputs has a great role in improving the quality of soil. In the study area the farmers are applying different organic farming system, specifically for this study the researcher address composting, Bio fertilizer, Intercropping and Animal manure contribution for the farming practice, and for household food security.

Conceptual Framework

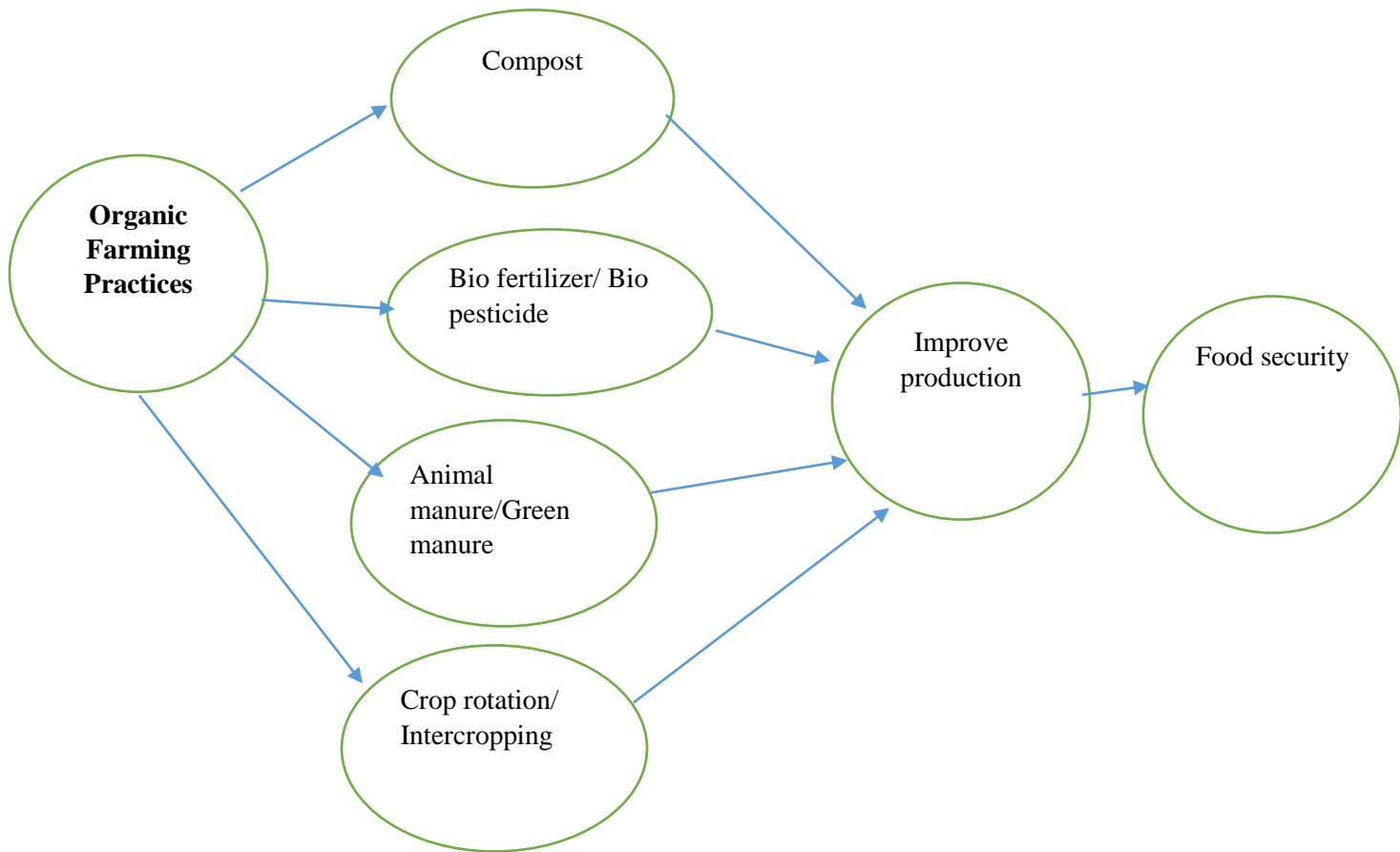


Fig 3.1. Conceptual framework of the study, own design, 2023

CHAPTER THREE

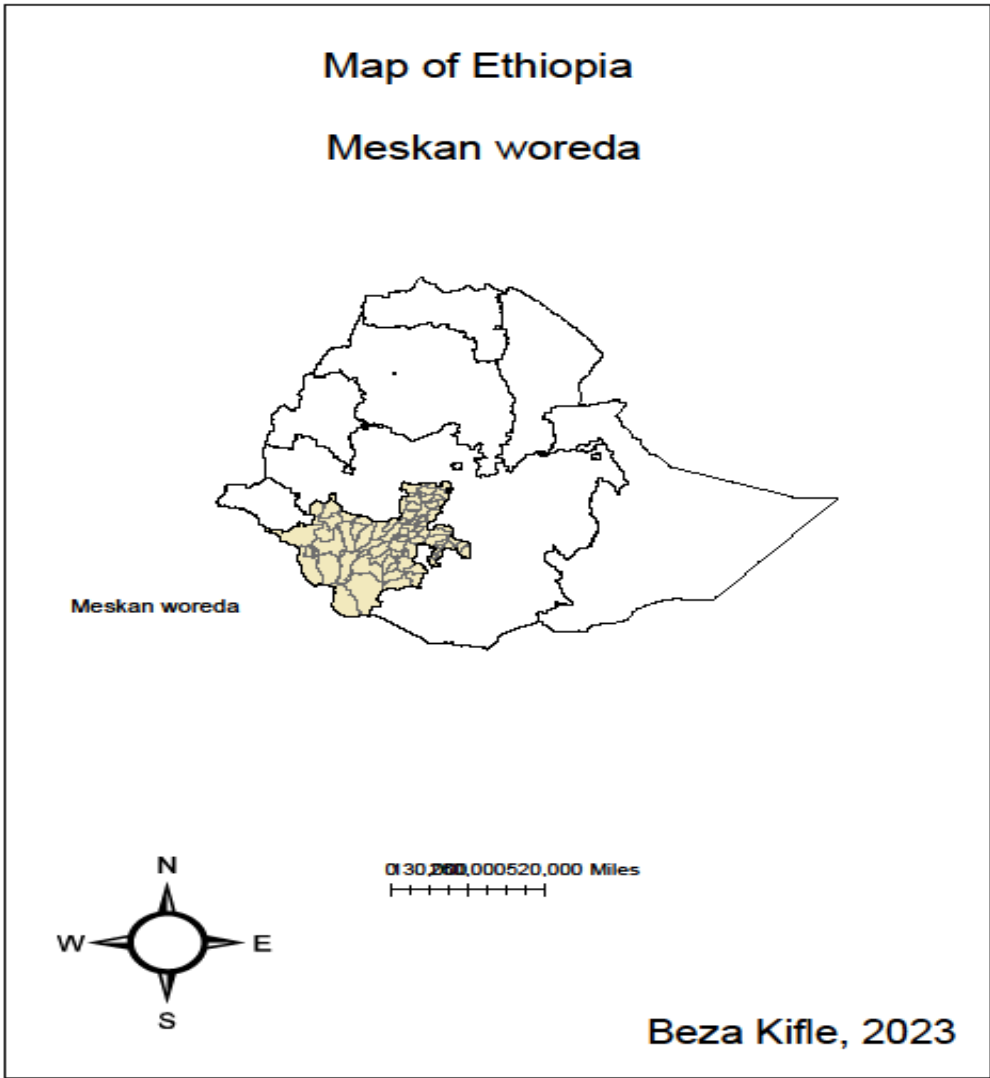
3. RESEARCH METHODOLOGY

3.1. Description of the Area

Meskan is one of the woredas in the Southern Nations, Nationalities, and Peoples' Region of Ethiopia, is a member of the Garages who are settled and it's the subject of the study. Meskane is bordered on the south by the Silt'e Zone, on the west by MuhorNa Aklil, on the northwest by Kokir Gedebanoon the north by sodo wereda, on the northeast by Sodo and Oromia, and on the southeast by Mareko. Mesqan ethnic group constitutes the majority. Compared to the Sebat Bet and Kestane Gurage ethnic groups, migration to other parts of Ethiopia is less common among the Mesqans.

The mean annual rainfall of the area is 1001-1200mm. The topography of the district is 10% highland, 55% leveled land, and 35% sloppy. The total area coverage of the district is 50,177 ha. The total hectare of land used for cultivation is 13,579. Total land covered with annual crop 31.3ha covered, 9.9ha perennial crop and 25.22ha grazing, forest and shrubs land, and 26.73ha covered with others. The total population size is 85,894 from this 67,130 are rural dwellers and 18,764 are in urban. Of rural dwellers 15,700 are farmers.

In the study area, basic facilities are available such as roads, hospitals, schools and also natural resources, water resource Ufaro River the bigger one and there are also other affluent in the area. The main livelihood activity in the study area is farming and the most crops grown are teff, Wheat, corn, Enset and chat also vegetables i.e. Tomato, cabbage, beetroot, carrot, and potato. Organic farming practices undertaken in the area are organic fertilizers, composting, intercropping etc



Fig, Map of study area

3.2. Research design and Research Methods

In this research both qualitative and quantitative research methods applied. In the case of Qualitative approach for this specific study primary data gathering tools from participant observation, in-depth interviews, and focus group discussion are critical and fundamental and also to share the life experience of the farmers. For the Quantitative approach, the researcher collect data from the Mesqan woreda administration and different related literatures used. The research design is descriptive,

3.2.1. Sampling techniques and sample size determination

The study area is Misraq Mesqan woreda and the researcher used purposive sampling method to select the three kebeles out of the 43 kebeles in the woreda. The main reason to select these kebeles are the farmers are practicing organic farming system and this study assess the contribution of organic farming practice in their household level. The total population in the woreda is population size is 85,894 from this 67,130 are rural dwellers and 18,764 are in urban. Of rural dwellers 15,700 are farmers, in three named, Yetebon, Beresa, and Shirshera Bido kebeles selected for the study.

To determine a representative sample size from the Misreq Mesqan woreda, the researcher uses a sample size determination formula given by Yamane (1967, 886) as cited in Glein D. (2013). Based on the information from the woreda in Misraq Mesqan woreda the total population size is 85,894 from this 67,130 are rural dwellers and 18,764 are in urban. Of rural dwellers 15,700 are total farmers from the selected three kebeles.

The relation is given as below: $n = N / (1 + Ne^2)$

n- Sample size

N- Population size

e = margins of error

n= 15,700

$$15,700/1+15,700(0.05)^2=390$$

Where n is the representative sample size, N is the total number of woreda population and e is the desired level of precision (error margin) $e = 5\%$ or 0.05 confidence level, the researcher will select the representative sample of 390 samples.

3.2.2. Data source and data collection tools

To acquire the necessary research data, the researcher conduct some steps. In the case of Qualitative approach for this specific study primary data gathering tools from participant observation, in-depth interviews, and focus group discussion are critical and fundamental and also to share the life experience of the farmers. The secondary data source from literature, and data from the woreda administration taken as a secondary data source. For the Quantitative approach, the researcher collects data from the Misraq Mesqan woreda and different kinds of literature.

The data collection tools are questionnaires, interviews, observation, and focus group discussion, to acquire the necessary research data, there are some steps to be conducted. Among others the following:

Interview, the researcher use the interview with the selected farmers, key informants to get the farmer's perception about the research topic and a structured interview used. The key informants were selected randomly about 50 small holder farmers were selected as interviewee.

Besides, the small holder farmers in the study area the researcher collects information from different department to better understand the organic farming practice contribution to household food security. The informants were woreda administration staff, agriculture department, extension workers assigned for the study kebeles and green way farm director. The interview was held in three group, the researcher informed the woreda Administration by having cooperation letter from Addis Ababa University, college of development and letter from Green way farm. All of the administration staff was gratified to be give information they know and any challenge they experience during their job.

The researcher didn't faced any challenge during this time. All their response is used as a main paper inputs in the result part of the paper and assisted a lot the researcher to suggest a decent recommendation.

A questionnaire, for the selected 390 samples of farmers' close-ended questionnaires' respondents will choose from a distinct set of pre-defined responses yes/no questions prepared in English and Amharic version to remove opacity with the farmers, and then the researcher translate it to English.

The main, puzzling part of data collection the researcher groups the samples in four and started the questionnaire and the households were very happy to fill the questionnaire, few of them were fully garage speakers and one of their family members helped in translating some of Amharic words.

Besides, the challenging part of the questionnaires' by itself the researcher didn't faced any challenge. All of the response analyzed by spss and used to generate result conclusion and recommendation for the study.

Observation, to better understand the research problem researcher observed the farmers' site and their farming practice and available resource in their area i.e. (water, soil, and others), how they manage their farm waste, their farming system. Therefore, this is helpful in understanding the study areas properly.

Focus group discussion: it is a good chance for farmers to share their experience and the discussion conducted with the selected farmers five farmers from each kebeles, the farmers are selected because they are producing more produce in the kebeles and some of them were getting awarded in different time. The researcher think they are more experienced and hard worker in the field can share important points.

In addition to the 15 famers woreda agriculture office administration and extension workers were part of the discussion , therefore a total of 23 peoples were attended from this 8 of them was females. The discussion was held in the secondary Scholl, next to green way farms in butajira.

During the discussion farmers' ideas, opinions, concerns, and the raised points taken and analyzed.

Documents, Related Literature, case studies, and woreda administration data used to compile and to support the research.

3.3. Data Analysis Method

Both qualitative and quantitative data analysis methods employed to analyze and collect the data. For the quantitative data, SPSS carried out to analyze the data. The baseline household survey data used to conduct a descriptive analysis of indicators describing households' Organic farming practice, and coping strategy. The qualitative data Analysis used to understand information from the interview, FGDs, observation, and questionnaire to capture contextual information about the organic farming practices in the study area and it's the contribution to food security of the household and it integrated with quantitative findings to provide a more comprehensive and contextually-specific picture of organic farming practices in the study area.

The data analysis conducted based on demographic information and the qualitative data collected from observation, interview, and focus group discussion, and the questionnaire collected, edited, coded, and then analyzed by SPSS. For a visual representation of finding and results tables used. In the study area to describe the organic farming practices in the area by qualitative data analysis method, interview, FGD, observation, and from the questionnaires the data collected and analyzed.

To determine the coping strategy the researcher asked the selected farmers (samples) the kind of coping strategies they use during the food insecurity time in the qualitative data collection and then take one most common method as a coping strategy in the study area.

3.4. Validity and reliability of data and techniques

The research cover the area of Misraq MeskanWoreda, Gurage Zone,South Central Ethiopia, kebeles and it addresses the organic farming practice contribution to household food security. The research is original and the data collected from a primary and secondary source and for all secondary source-related literature it will be cited to avoid plagiarism.

To test the validity of the collected data the researcher used correlation to test how well the measures were correlated with one another. To test the reliability of the data collected the researcher used Cronbach's alpha by doing so the internal consistency of the instrument was able to be observed. The reliability was checked on 50 respondent's answers before the questioner was disseminated in full scale.

Table 3.1 Reliability results

Sub scales	Number of items	Cronbach's Alpha
Compost Usage	5	.854
Bio fertilizer Usage	5	.856
Animal manure	5	.881
Crop rotation and Intercropping	5	.781
Entire scale	20	.820

As it is indicated on the above table Cronbach's coefficient alpha was calculated for each field of the questionnaire and the entire questionnaire. The values of Cronbach's Alpha showed that all of the results are more than acceptable, which fall in the range between 0.7 and 0.95. The resulting range is considered high as the result ensures the reliability of each field of the questionnaire. Moreover Cronbach's Alpha for the entire questionnaire shows the value of 0.820 which falls in an excellent range and it indicates reliability of the entire questionnaire. Therefore, based on the test, the results for the items are reliable and acceptable.

3.5. Ethical consideration

This research conducted in a way that doesn't subject the participant to any harm and privacy is ensured. Conducted the research prioritizing respecting the dignity of research participants. Full consent obtained from the participants before the study.

CHAPTER FOUR

4. RESULTS AND DISCUSSIONS

4.1. Introduction

In this chapter, the result obtained from the questionnaire survey are presented and analyzed. First demographic characteristics of the respondents are presented. It follows with a summary respondent's reply on various variables are presented. Then it follows with description of the data gathered, discussed and analyzed the findings carefully in order to assess the effect of various independent variables with the dependent variable of findings has been organized in accordance with the study objectives.

Consequently, this chapter presents the results and findings of the research. 390 questionnaires were disseminated for respondents; from which 384 questionnaires were recollected with 98.4% return rates. The remaining questionnaires were unreturned to the researcher and/or incomplete due to the personal reasons of some participants. The chapter mainly includes data results from the statistical tests conducted on the gathered primary data. Descriptive analysis and inferential analysis of the study are presented as follow respectively.

4.2. Demographic Characteristics of Respondents

To describe demographic characteristics of respondent age, gender, education level, and family size were used as an attribution variables. Regarding the first variable, age of respondents, the great majority of them 83.9% were in the age group 31-40 followed by 8.1% respondents in each of 18-30 years of age category as well as in 41-60 years of age category.

Concerning the sex of respondents, more than half 55.7% of them were males while the remaining 44.3% of them were female respondents.

Women play active role in almost all aspects of agricultural activities across the world. The role of women in all aspects of agricultural activities are very high. In crop production. Women's participation starts from preparing farm land for sowing and ends storing in small ganary kept in house. Women assist their husbands in agricultural activities such as soil preparation, maturing, weeding and harvesting (Moa.A.2019).

Ethiopian rural women make significant contribution to subsistence agriculture and to ensuring food security and are the mainstay of the farm labor. They work in all aspects of agricultural production including crop and livestock production and are responsible for all household chores. They also work under heavy workload compared with their men counterparts. Yet, the prominent role of women in agriculture is often unrecognized and underestimated. Hence, this review was initiated with the objectives of collecting and compiling information on the role of rural women in agricultural and rural development and to point out constraints limiting participation of women in the development process of the sector (Fikirneh.K. 2012).

From the samples 44.3% are female respondents, from this we can say that women's are contributing in the farm process in different ways, including the selling the farm products to the market.

Regarding the educational background of the respondents, more than half of the total respondents 71.9% were 7 – 12 grades followed by 11.2% of the respondents who were in 1 – 6 grades. The next group of respondents 8.9% respondents were above 12 grade. The remaining only tiny percentage 8.1% of the total respondents were illiterate. This result implies that the majority of this study respondents were educated and can fill the questionnaires with little or no assistance from data enumerators.

People very much appreciate education since it enables them to behave decently and respond wisely to uncertain economic and social incidents. Therefore, many households in rural areas of developing countries have deliberately devoted an enormous portion of their income and scarce resources to attaining good education. That education yields positive returns from agricultural production remains an open issue in Vietnam since it has been overlooked. If one can prove a positive role of education to agricultural output, it is worthwhile raising investment to enhance opportunities for people to attend classes and to improve school quality. In other words, such a role of education would mean that there is a value of allocating a greater deal of resources to promote education, thus boosting long-term economic and agricultural growth (Le.k , 2020).

In the study area about 71.9% were above grade six, this will help the farming system in many different ways by allocating and use the resources wisely, promoting the local innovations and

improved school quality could help the farmers to use and improve their indigenous knowledge and to work better on the agriculture system.

Lastly, regarding the family size of the respondents, 97.9% of the total respondents had 1 – 5 family members in their household, followed by 2.1% of the total respondents with no additional family members. This indicate the presence family members in most of this research respondents.

4.3. Source of income

Concerning the source of income, the following table shows the majority of the respondents 95.1% earn their income from only agricultural activities while 3.4% of them reported that they had family support. The remaining 1.6% of the total respondents had practicing agriculture in addition to other economic activities.

Table 4.2. Economic Source

What is your economic source?		Frequency	Percent
Responses	Only agriculture	366	95.1
	Agriculture and other	6	1.6
	Family support	13	3.4
	Total	385	100.0

4.4. Application of Bio fertilizer

Based on the subsequent table, the usage of bio fertilizer was 98.4% while only1.6% of the total respondent do not use bio fertilizers. This indicates the application of bio fertilizers are very prevalent in the study area. Therefore, it is a best indicator of the practice of bio fertilizer in the study area.

In the study kebeles Biofertilizer is practiced by the farmers splendidly, about 98.4% of farmers are experiencing based on the survey, An increase in income and have a diversified diet for your family, access and available different types of foods about mean =3.54, and SD =1.27, this implies that the application of Biofertilizer has an impact on their income and they can access different types of food.

With this regard application of Bio fertilizer can be prepared by the farmers by them self's and helps them to earn more income, to have a diversified variety of foods, to improve their crop pest and disease resistance capacity.

Table 4.3. Bio Fertilizer usage

Have you applied bio fertilizer to your farm?		Frequency	Percent
Responses	Yes	379	98.4
	No	6	1.6
	Total	385	100.0

4.5. Assessment of Compost Usage

In this part descriptive statistics in the form of mean and standard deviation were presented to illustrate the level of agreement of the respondents with their implications of the company. The responses of the respondents for the variables indicated below were measured on five point Likert scale with: 1= strongly disagree, 2= disagree, 3 = neutral, 4= agree and 5= strongly agree. However, while making interpretation of the results of mean the scales were reassigned as follows to make the interpretation easy and clear.

This formula is adapted from (Vichea, 2005), with 5 point scales, the interval for breaking the range in measuring each variable id calculated by $5-1/5= 0.8$. It means items with scores fall between the ranges of: 4.20 – 5.00 are considered as strongly agreed; 3.40 – 4.09 as agreed: 2.60 – 3.39 as Neutral; 1.08 – 2.59 as disagree and 1.00 – 1.79 strongly disagree.

Other result discussions are also presented along with the results of the questionnaire. Data from questionnaires were processed by SPSS program in terms of frequency, mean, and standard deviation (Descriptive statistics).

Based on the results depicted on table 4.4., regarding the usage level of compost in the study area, most of the responses fall in the agreement range (Mean > 3.4). This includes; whether having enough knowledge to prepare compost from animal manure or from farm waste (mean = 3.92, and SD = 1.03), whether It is stress-free to make compost in your home for your garden (mean =3.81, and SD = 1.13), whether Making of compost by using all the resources you have to have more/enough compost for your farm (mean =3.72 , and SD =1.07), whether Using compost have an impact on improvement in the quality of crops(mean =3.74 , and SD = 1.06), and whether Providing crops get good improvement on disease and pest resistance by the application of compost (mean = 3.77, and SD = 1.125).

This result implies that with regards to compost usage in the study area, participants had enough knowledge with regards to the preparing of compost from animal manure or from farm waste, it was also stress-free to make compost in their home for their garden, making of compost by using all the resources the possess for your farm which will further improves the quality of crops as well as protection of disease and improving pest resistance by the application of compost

Table 4.4 Compost Usage

Items	Agreement Level					Mean	SD
	1	2	3	4	5		
Enough knowledge on compost preparation	4 (1.0%)	62(16.1%)	13(3.4%)	187(48.6%)	119(30.9%)	3.9221	1.03790
Easy to make compost in home	16(4.2%)	62(16.1%)	9(2.3%)	188(48.8%)	110(28.6%)	3.8156	1.13870
Enough resource to prepare compost	20(5.2%)	52(13.5%)	15(3.9%)	225(58.4%)	73(19.0%)	3.7247	1.07869
Compost impact on quality of crops	22(5.7%)	44(11.4%)	15(3.9%)	235(61.0%)	69(17.9%)	3.7403	1.06069
Compost application impact on resistance disease and pest	28(7.3%)	37(9.6%)	16(4.2%)	215(55.8%)	89(23.1%)	3.7792	1.12527

4.6. Assessment of Bio fertilizer Usage

The following section presents the usage of bio fertilizers in the study area in order to assess their knowledge, accessibility of environmental inputs, expenses incurred during the preparation of bio fertilizers and other related issues.

Table 4.5. Bio fertilizer Usage

Items	Agreement Level					Mean	SD
	1	2	3	4	5		
Having enough knowledge to prepare a bio fertilizer	17(4.4%)	58(15.1%)	21(5.5%)	176(45.7%)	113(29.4%)	3.8052	1.14609
Getting the inputs easily in your environment to prepare the Bio fertilizer /Bio pesticide and they are affordable	26(6.8%)	55(14.3%)	17(4.4%)	175(45.5%)	112(29.1%)	3.7584	1.20819
Making those organic products you can save expenses for buying chemicals	44(11.4%)	39(10.1%)	24(6.2%)	201(52.2%)	77(20.0%)	3.5922	1.23846
Impact on crops on disease and pest control and to yield a good product	15(3.9%)	55(14.3%)	50(13.0%)	194(50.4%)	71(18.4%)	3.6519	1.05742
An increase in income and have a diversified diet for your family, access and available different types of foods.	43(11.2%)	52(13.5%)	22(5.7%)	187(48.6%)	81(21.0%)	3.5481	1.27001

Based on the results related Bio fertilizer Usage items fall in the agreement range (mean > 3.39). These items include, whether having enough knowledge to prepare a bio fertilizer (mean = 3.80, and SD = 1.14), whether Getting the inputs easily in your environment to prepare the Bio fertilizer /Bio pesticide and they are affordable (mean = 3.75 , and SD = 1.20), whether Making those organic products you can save expenses for buying chemicals (mean = 3.59, and SD = 1.23), whether Impact on crops on disease and pest control and to yield a good product (mean = 3.65 , and SD = 1.05) and whether An increase in income and have a diversified diet for your family, access and available different types of foods (mean = 3.54 , and SD = 1.27)

The above result implies that with regards to bio fertilizer usage, they have enough knowledge to prepare a bio fertilizer, there is also accessible usage of input to prepare the Bio fertilizer /Bio pesticide, making those organic products you can save expenses for buying chemicals, and it also contribute for crop disease reduction and pest control to yield more crop outputs thereby increasing the level of income of the household.

4.7. An assessment of Animal manure/Green manure usage

This section presents various items for respondents with regards to Animal manure/Green manure usage in their farming activity with could result in increasing production of crops and other food security benefits as well.

Table 4.6 Animal manure/Green manure usage

Items	Agreement Level					Mean	SD
	1	2	3	4	5		
Having enough knowledge on how to apply animal and green manure on your farm	12(3.1%)	79(20.5%)	40(10.4%)	170(44.2%)	84(21.8%)	3.6104	1.1291
use of all the animal manure and green manure for your farm	14(3.6%)	41(10.6%)	35(9.1%)	187(48.6%)	108(28.1%)	3.8675	1.0535
Impact on soil fertility and improves production.	11(2.9%)	47(12.2%)	46(11.9%)	197(51.2%)	84(21.8%)	3.7688	1.0160
Great role in improving production and good quality products and	20(5.2%)	47(12.2%)	70(18.2%)	169(43.9%)	79(20.5%)	3.6234	1.0973

good market pricing.							
Increase in income and have a diversified diet for your family, and access and available different types of foods.	7(1.8%)	76(19.7%)	36(9.4%)	162(42.1%)	104(27.0%)	3.7273	1.11613

The results of the above table depicts that all the responses fall in the agreement range for items which asks respondents whether The results of the above table depicts that all the responses fall in the agreement range for items which asks respondents whether having enough knowledge on how to apply animal and green manure on your farm (mean = 3.61, and SD = 1.12), whether use of all the animal manure and green manure for your farm(mean = 3.86, and SD =1.0), whether Impact on soil fertility and improves production (mean =3.76 , and SD =1.01), whether Great role in improving production and good quality products and good market pricing (mean = 3.62, and SD = 1.09), and whether Increase in income and have a diversified diet for your family, and access and available different types of foods (mean =3.72 , and SD =1.11) .

The above descriptive results also showed that the usage of animal manure/green manure helped to increase soil fertility, boost crop production since, increase production and good quality products and good market pricing as well as Increase in income and have a diversified diet for your family, and access and available different types of foods.

4.8. Assessment of Crop rotation and Intercropping

Both Intercropping and Crop Rotation are different ways of setting up a multi-cropping system. There is one primary difference between how these two farming methods achieve that goal. Intercropping uses spatial diversification (alternate crops mixed together in the available area). Crop rotation gets based on temporal diversification. Therefore, the following section was devised to measure crop rotation and intercropping activities and their effect for households' food security.

Table 4.7. Assessment of Crop rotation and Intercropping

	Agreement Level					Mean	SD
	1	2	3	4	5		
Improves soil fertility and increases yield by improving the soil nutrient.	12(3.1%)	56(14.5%)	32(8.3%)	144(37.4%)	141(36.6%)	3.8987	1.14229
Increase the total food availability and the net return from selling it	12(3.1%)	58(15.1%)	28(7.3%)	179(46.5%)	108(28.1%)	3.8130	1.09751
Helps to control weeds and pests.	18(4.7%)	45(11.7%)	57(14.8%)	186(48.3%)	79(20.5%)	3.6831	1.06963
Helps in the prevention of soil erosion and added nutrients from the main crop.	11(2.9%)	67(17.4%)	39(10.1%)	188(48.8%)	80(20.8%)	3.6727	1.07621
Earning more income and improve the food security of your family.	30(7.8%)	44(11.4%)	30(7.8%)	187(48.6%)	94(24.4%)	3.7039	1.18172

The outcomes of the above table illustrates that all the responses fall in the agreement range for items which asks respondents whether crop rotation and intercropping improves soil fertility and increases yield by improving the soil nutrient (mean = 3.89, and SD = 1.14), whether crop rotation and intercropping Increase the total food availability and the net return from selling it (mean =3.81 , and SD =1.09), whether crop rotation and intercropping helps to control weeds and pests (mean =3.68 , and SD = 1.06), whether crop rotation and intercropping helps in the prevention of soil erosion and added nutrients from the main crop (mean =3.67 , and SD =1.07) as well as whether crop rotation and intercropping Earning more income and improve the food security of your family (mean =3.70 , and SD =1.18).

The above result indicates the practice of crop rotation and intercropping helped farmer to improve soil fertility and increases crop yield, generate better revenue through higher level of market acceptance of the crop, prevention of soil erosion, and earing of higher income.

4.9. Multiple Regression Result

The following regression analysis is used for estimating the relationships among variables. It enables to determine the strength of the relationship between variables and the predictive power

of the independent variables on the dependent variable. In short, regression helps a researcher understand to what extent the change of the value of the dependent variable causes the change in the value of the independent variables, while other independent variables are held unchanged. Regression analysis is a way of statistically sorting out the variables that have indeed an impact. While there are many types of regression analysis, at their core they all examine the influence of one or more independent variables on a dependent variable.

Before moving on conducting a regression analysis, the basic assumption tests for the model must be carried out. This is a compulsory precondition in explaining the relationships between dependent and explanatory variables. Four major assumptions namely, Linearity Test, Homoscedasticity Test, Auto Correlation (Durbin Watson Test), and Normality Test checked and proved to be met reasonably well. Each test is explained below:

The following regression analysis is used for estimating the relationships among variables. It enables to determine the strength of the relationship between variables and the predictive power of the independent variables on the dependent variable. In short, regression helps a researcher understand to what extent the change of the value of the dependent variable causes the change in the value of the independent variables, while other independent variables are held unchanged.

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1. Linearity Test

The linearity of associations between the dependent and independent variables can be tested by looking at the P-P plot for the model. The closer the dots lie to the diagonal line, the closer to normal the residuals are distributed. As depicted in the below graph, the visual inspections of the p-p plot revealed that there exist linear relationship between the dependent and independent variables.

2. Multi-collinearly Test

Multi-collinearity exists whenever an independent variable is highly correlated with one or more of the other independent variables in a multiple regression equation. It is a problem because of it under mines the statically significance of an independent variable. For this study result of multi-collinearity test of the dependent variables was display in the following table.

Tables 4.9: Multi-collinearly test of the Independent Variable

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Compost Usage	.436	2.295
	Bio fertilizer Usage	.453	2.208
	Animal manure	.301	3.318
	Crop rotation and Intercropping	.294	3.402

The variation inflation factor (VIF) is a measure of the reciprocal of the complement of the inter-correlation among the independent variables. The decision rule is a variable whose VIF value is greater than 10 indicates the possible existence of the multicollinearity problem. Tolerance (TOL) is a statistic used to show the variability of the specified independent variable that is not explained by another independent variable in the model. It is also used by many researchers to check on the degree of Collinearity. The decision rule for tolerance is a variable whose TOL value is less than 0.1 shows the possible existence of a multi-collinearity problem (Gujarati, 2004). From the above table information, all VIF variables less than 10 and all tolerance (T) is greater than 0.1, therefore, this study has no multi-collinearity problem.

Table 4.10 the regression model statistics

Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.846 ^a	.716	.713	2.55399		
a. Predictors: (Constant), Crop rotation and Intercropping, Bio fertilizer Usage, Compost Usage, Animal manure						
b. Dependent Variable: Household Food Security Level						
ANOVA						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	6249.878	4	1562.470	239.538	.000 ^b
	Residual	2478.683	380	6.523		
	Total	8728.561	384			
a. Dependent Variable: Household Food Security Level						
b. Predictors: (Constant), Crop rotation and Intercropping, Bio fertilizer Usage, Compost Usage, Animal manure						

The above model also showed that the model is significant in predicting Household Food Security Level and it is interpreted as 71.6 % of variance in Household Food Security Level is due to the usage of Crop rotation and Intercropping, Bio fertilizer Usage, Compost Usage, Animal manure (p value < 0.05). Whereas the remaining variability was unexplained and it can be explained by adding other variables that is not included in this model. Therefore, p-value test table shows that model is working well.

Table 4.11 Coefficients

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
		1	(Constant)	1.205		
	Compost Usage	.446	.040	.461	11.124	.000
	Bio fertilizer Usage	.384	.039	.404	9.947	.000
	Animal manure	.061	.060	.051	1.018	.309

Crop rotation and Intercropping	.030	.054	.028	.561	.575
a. Dependent Variable: Household Food Security Level					

According to table above coefficient table, compost usage and bio fertilizer usage have significantly predicted household food security level while animal manure and crop rotation and intercropping did not found to significantly affect household food security level.

Compost Usage was found positively affect household food security level with beta value of .446 and sig value of .000. This indicates that 1 unit increase in Compost Usage will improve Household Food Security Level by 0.446 units.

Additionally, Bio fertilizer Usage was also found positively affect household food security level with beta value of .384 and sig value of .000. This indicates that 1 unit increase in Bio fertilizer Usage will improve Household Food Security Level by 0.384 units.

Other studies support the above result such as Muse, (1993), and Zibilske, (1987) who argued that in clay soils, compost helps to add porosity to the soil, making it drain easier so that it does not stay waterlogged and does not dry out into a bricklike substance. Compost also inoculates the soil with vast numbers of beneficial microbes (bacteria, fungi, etc.) that promote biological activity of the soil. These microbes are able to extract nutrients from the mineral part of the soil and eventually pass the nutrients on to plants.

Furthermore, Rynk et al (1992) and Minnich and Hunt, (1979) found that properly processed compost reduces soil-borne diseases without the use of chemical control. The disease suppressing quality of compost is just beginning to be widely recognized and appreciated. Farm fields treated with compost are also less prone to erosion. In short, high-quality compost will do more for soil fertility and soil quality than commercial fertilizer.

Other studies such as Morte et al 2003; Corpoica 2007; Rivera-Cruz et al 2008; Alvarez et al 2007 have confirmed that Biological fertilization improve fixation of nutrients in the rhizosphere, produce growth stimulants for plants, improve soil stability, provide biological

control, biodegrade substances, recycle nutrients, promote mycorrhiza symbiosis, and develop bioremediation processes in soils contaminated with toxic, xenobiotic and recalcitrant substances.

Additionally, Chirinos et al 2006; Corpoica 2007 and Porcuna et al 2002 have implied that use of bio-fertilizers can improve productivity per area in a relatively short time, consume smaller amounts of energy, mitigate contamination of soil and water, increase soil fertility, and promote antagonism and biological control of phytopathogenic organisms.

As a result of the good structure provided to the soil, root growth is promoted. The content of organic matter in soil is higher than normal levels. Promotes the development of mycorrhizal associations, which increases the availability of phosphorus (P) on the soil. Help to eliminate plantar diseases and provide continuous supply of micronutrients to the soil. Contribute to the maintenance of stable nitrogen (N) and phosphorus (P) concentrations. Improvements on the capacity of nutrients' exchange in the soil.

Additionally, Jonson (2012) argued that investing in agricultural training is important to meet the food needs of the growing population, improve food security, and to enable farmers to adapt to different challenges such as changing climatic conditions. The farmers in this study perceived organic practice as worthwhile. The evidence suggested that their expenditure on food was often less than the minimum food basket required for someone who is reliant on purchasing food. The farmers were able to utilize locally available resources and appropriate technology to produce for their needs (some produced more). They perceived organic farming as confirmation of the nature conserving practices of their ancestors. This connection encourages adoption because it feels right, is socially and culturally coherent, and is consistent with their values and beliefs.

In addition in the area, so far the farmers are not experiencing such a hard environmental problem and food shortage. Farmers have also livestock's, and especially the women's can earn income by selling livestock production such as egg, milk, hen and sometimes cattle.

CHAPTER FIVE

5. CONCLUSIONS AND RECOMMENDATIONS

5.1. Conclusions

The major purpose of this study is to assess rural households' organic farming practices' contribution to food security in Misraq Meskan woreda. Accordingly, both descriptive and inferential statistical methods were used to arrive at the following conclusions.

Based on the descriptive results of this study, the majority of the residents of Misrak Meskan woreda (95.1%) earn their income from only agricultural activities while 3.4% of them had family support. The remaining 1.6% of the total respondents had practicing agriculture in addition to other economic activities. The usage of bio fertilizer was 98.4% while only 1.6% of the total respondent do not use bio fertilizers. The application of bio fertilizers are very prevalent in the study area. Therefore, it is a best indicator of the practice of bio fertilizer in the study area.

With regards to bio fertilizer usage, they have enough knowledge to prepare a bio fertilizer, there is also accessible usage of input to prepare the Bio fertilizer /Bio pesticide, making those organic products you can save expenses for buying chemicals, and it also contribute for crop disease reduction and pest control to yield more crop outputs thereby increasing the level of income of the household. The results also showed that the usage of animal manure/green manure helped to increase soil fertility, boost crop production since, increase production and good quality products and good market pricing as well as Increase in income and have a diversified diet for your family, and access and available different types of foods. This study also found that the practice of crop rotation and intercropping helped farmer to improve soil fertility and increases crop yield, generate better revenue through higher level of market acceptance of the crop, prevention of soil erosion, and earning of higher income.

Generally, from both descriptive and inferential statistical methods in the study areas the common organic farming practices are Composting, Intercropping, Biopesticide and Animal manure these practices have a positive impact on the household food security by improving their farm products which leads them to have more income and the application of those practices help the farmers to have a diversified diet, by planting different vegetables. As a coping strategy the

farmers in the study area Enset, and in addition to that they have cash crops such as coffee, chat, orange and other seasonal crops.

Finally, the regression analysis found that 71.6 % of variance in Household Food Security Level is due to the usage of Crop rotation and Intercropping, Bio fertilizer Usage, Compost Usage, Animal manure (p value < 0.05). Individually, compost usage and bio fertilizer usage have significantly predicted household food security level while animal manure and crop rotation and intercropping did not found to significantly affect household food security level. The study has found that Compost Usage and Bio fertilizer Usage contributes for household food security in Misrak Meskan woreda.

In the Economic aspect the farmers applying organic farming practice get a good economic income by selling organic produce in market by improved cash than the conventional produce. The company purchase organic produce from the partner farm by better price, such as avocado, green beans, chili, parsley, rosemary, lemongrass etc. The company purchase all the produce from the farmers by two birr price additional from the current market by this the farmers producing organic products are getting high income relatively from other produces. In addition to this the farmers are getting good income from their yield and have a good livening condition the young Childers also gets job opportunity by the company by contract base tis also help the household to improve household Income. The farmers produces organic produce manage their environment prudently, they manage their farm waste effectively for their farms and the nutrient is recycled in their farm.

5.2. Recommendations

Based on the results of this study, the following recommendations are forwarded.

- The research started to study the organic practice undertaken in the area to pact with this objective, The common organic farming practices are intercropping, composting, Biofertilizer and Animal manure are practiced in the study area. Based on the descriptive and inferential statistical methods the organic farming practice have positive implication on the household food security, from the survey the farmers are contented with the practices since they got an improvement on their farm good production from the farm, earn better income, having a diversified food in their dish and makes their life enhanced.
- Since organic agriculture has a positive contribution to household food security, investing in organic agricultural training, among other strategies, is an important long-term strategy to fight food insecurity. Therefore, the government need to finalize the national policy on organic farming production also to develop a policy implementation strategy with clear plans to train farmers and support those farmers that are involved in organic farming. Access to information and advisors who can facilitate farmers' learning are important issues for the future implementation of organic and agro-ecological methods.
- Regarding the farmer changes from conventional to organic farming, there is the need for appropriate agricultural extension and nutritional advice or programmers, championed by the government and other concerned stakeholders, to support the accumulation of knowledge and experience that optimize production of organic foods. For example, appropriate agricultural extension advice can help improve organic agricultural practices while appropriate nutritional advice or programmers can help households to diversify their organic crops for nutritional benefits.
- There is a need for households to re-claim ownership of their own food security and take advantage of food security programs. For this to happen effectively, it is recommended that government and other concerned stakeholders should initiate and facilitate the

implementation of capacity-building programs, particularly around organic farming. This will ensure that farming households have access to the necessary skills for increased efficiency in the application of organic farming practices. Appropriate training of extension officers is key in organic farming.

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ADDIS ABABA UNIVERSITY
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My name is Beza kifle, I am currently working on research for the partial fulfillment of my postgraduate study in Food security and development studies at Addis Ababa University. I am doing a study to assess the appraisal of organic farming practice's contribution to rural household food security in Misraq meskan woreda. In complete this I have planned to collect the data from the Misraq mesqan woreda farmers.

Kindly, complete this survey that has 5 parts: General information, Compost, Biofertilizer/Biopesticide, Animal manure/Green manure, Crop rotation, and intercropping respectively. And household food insecurity access scale (HFIAS) measurement to measure the access dimension of food security occurrence questions for the group discussion and questionnaires''.

I guarantee you that your response will only be used for this research purpose and will not be disclosed anywhere else. I am grateful for your time and I kindly request you to respond to all the questions as honestly and accurately as possible as this study needs to be of value to the researcher.

Part one, General question,

1. Age

25-35 35-50 50 and above

2. Sex

Male Female

3. Education level

High School Diploma Degree MA

4. How many families do you have?

No family 1-5 6-10

5. What is your main economic income?

Only Agriculture Agriculture and other Family support

6. How many hectares of land do you have?

<100 200-400 >400

Part Two, Compost

1. Do you have enough knowledge to prepare compost from animal manure or from farm waste?

Strongly agree Agree Undecided Disagree strongly disagree

2. It is stress-free to make compost in your home for your garden.

Strongly agree Agree Undecided Disagree strongly disagree

3. You are making compost by using all the resources you have to have more/enough compost for your farm?

Strongly agree Agree Undecided Disagree strongly disagree

4. Using compost have an impact on improvement in the quality of crops?

Strongly agree Agree Undecided Disagree strongly disagree

5. Do crops get good improvement on disease and pest resistance by the application of compost?

Strongly agree Agree Undecided Disagree strongly disagree

6. By the application of compost, you got an increase in income and have a diversified diet for your family, access and available different types of foods.

Strongly agree Agree Undecided Disagree strongly disagree

Part Three, Biofertilizer/Biopesticide

1. Do you have enough knowledge to prepare a biofertilizer/ biopesticide?

Strongly agree Agree Undecided Disagree strongly disagree

2. You will get the inputs easily in your environment to prepare the Biofertilizer/Biopesticide and they are affordable?

Strongly ag Agree Undecided Disagree strongly disagree

3.By making those organic products you can save expenses for buying chemicals?

Strongly ag Agree Undecided Disagree strongly disagree

4. Application of Biofertilizer/Biopesticide have an impact on crops on disease and pest control and to yield a good product?

Strongly ag Agree Undecided Disagree strongly disagree

5. By the application of Biofertilizer/Biopesticide, you got an increase in income and have a diversified diet for your family, access and available different types of foods.

Strongly agree Agree Undecided Disagree strongly disagree

Part Four, Animal manure/Green manure

1. Do you have enough knowledge on how to apply animal and green manure on your farm?
Strongly agree Agree Undecided Disagree strongly disagree

2. Are you ok to use all the animal manure and green manure for your farm?

Strongly ag Agree Undecided Disagree strongly disagree

3. Application of animal and green manure great impact on soil fertility and improves production.

Strongly ag Agree Undecided Disagree strongly disagree

4. Application of animal and green manure has a great role in improving production and good

quality products and good market pricing.

Strongly agree Agree Undecided Disagree strongly disagree

5. By the application of animal and green manure, you got an increase in income and have a diversified diet for your family, and access and available different types of foods.

Strongly agree Agree Undecided Disagree strongly disagree

Part Five, Crop rotation and Intercropping

1. Crop rotation improves soil fertility and increases yield by improving the soil nutrient?

Strongly agree Agree Undecided Disagree strongly disagree

2. Does crop rotation increase the total food availability and the net return from selling it?

Strongly agree Agree Undecided Disagree strongly disagree

3. The application of intercropping helps to control weeds and pests.

Strongly agree Agree Undecided Disagree strongly disagree

4. Intercropping helps in the prevention of soil erosion and added nutrients from the main crop.

Strongly agree Agree Undecided Disagree strongly disagree

5. By the application of Crop rotation and Intercropping, you can earn more income and improve the food security of your family.

Strongly agree Agree Undecided Disagree strongly disagree