COLLEGE OF DEVELOPMENT STUDIES

CENTER FOR FOOD SECURITYSTUDIES

THE CONTRIBUTION OF SUSTAINABLE LAND MANAGEMENT PRACTICES AND PARTICIPATION OF FARMERS TO HOUSEHOLDS FOOD SECURITY IN TARMABER WOREDA, AMHARA REGION, ETHIOPIA

BY

ETIFWORK GIRMA AWLE

DECEMBER, 2020

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A THESIS SUBMITTED TOCENTER FOR FOOD SECURITY STUDIES, COLLEGE OF DEVELOPMENT STUDIES, ADDIS ABABA UNIVERSITY, FOR THE PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN FOOD SECURITY AND DEVELOPMENT

DECEMBER, 2020

ADDIS ABABA, ETHIOPIA

Approval Page

As advisor of the thesis, I certify that I have read and evaluated the thesis prepared by Etifwork Girma, under my guidance, entitled “The contribution of sustainable land management practices and participation of farmers to households food security in *Tarmaber Woreda, Amhara* region, Ethiopia" and I recommend that for open defence as fulfilling the requirements for the degree of Master of Science in Food Security and development.

Meskerem Abi (PhD)	23/10/2020	
Advisor	Date	Signature

As a member of examining board of this thesis open defense, we certify that we have read and evaluate the thesis prepared by Etifwork Girma entitled “The contribution of Sustainable Land Management Practices to Household Food Security in the case of Tarmaber, Amhara Region, Ethiopia" recommend that it is acceptable as thesis required for the degree of Master of Science in Food Security and Development.

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Approval by the Center Head.

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Acknowledgments

First, I bow my head to him, the all-mighty merciful God for His hand of blessing and bestowing a creative and safe atmosphere during my time of academic study. It is by grace and the Almighty's will that I have this great privilege to express my greetings and appreciation to those who helped me and assisted me in compiling my thesis at various levels.

It is my proud privilege to express my heartfelt indebtedness and deepest sense of gratitude to Dr. Meskerem Abi for her valuable inspiring guidance, through provoking discussion, constant encouragement, insight, unfailing interest, infinite patience, constructive and enthusiastic nature not only throughout this course of investigation and in the preparation of thesis manuscript but also during the entire study period. Her delightful approach, sympathetic understanding and generosity have been much beyond her formal obligations as a mentor of my thesis, for which I am deeply indebted to her.

I am extremely thankful and will be indebted lifelong to my parents for their unremitting encouragement, ceaseless inspiration, infinity times infinity love in this very work as well as back then.

I would like to sincerely express my humble and deep sense of gratitude to My Family and many more for their continuous support and encouragement in idea and technical supports.

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Acronyms

ANRS	Amhara National Regional State
CSA:	Central Statistics Authority
ESIF:	Ethiopia Strategic Investment Framework
EthiOCAT:	Ethiopian Overview of Conservation Approach and Technology
FAO:	Food and Agricultural Organization
GIZ:	Gesellschaft fur International Zusammenarbeit
HDDS:	Household Dietary Diversity Scale
HFBM:	Household Food Balance Model
HFIAS:	Household Food Insecurity Access Scale
M.A.S.L:	Meter Above Sea Level
MoA:	Ministry of Agriculture
RCSI:	Reduced Coping Strategy Index
SLMP:	Sustainable Land Management Practice
SNNP:	Southern Nations, Nationalities and Peoples Region
SWC:	Soil and Water Conservation
USD	United States Dollar
WFP:	World Food Program

ABSTRACT

The aim of this study was to examine the contribution of sustainable land management (SLM) practices and participation of farmers to household food security in Tarmaber Wereda, Amhara Region. There was 196-sample size and the research used descriptive research design, and both Qualitative and Quantitative research approaches are employed. Data for this study was collected using household surveys, focus group discussions, key informant interviews and field observations. Quantitative data collected using household surveys were analyzed using statistical techniques. Qualitative data collected through field observations, focus group discussions, key informant interviews and secondary data sources were analyzed using thematic content analysis. Results show that there was very poor and inadequate effectiveness to control erosion in terms of implementation of SLM practices due to lack of strict rules and regulation and social awareness in the Tarmaber wereda. In addition, the findings of this study revealed that there is limited financial, physical, human resources, SLM policy, social inclusive like the farmers and scarcity of food or poverty and inadequate SLM practices system exist in Wereda. Farmers in the study area face challenges of getting adequate income for their livelihood. At the same time, there is lack of adoption of labour-intensive technologies. The data, analysis shows that some respondents are aged, older farmers have a short planning perspective compared with younger colleagues, traditional /religious educated farmers due to that participated SLM practices are low and the land is not productive, less fertile, and 30.6% agricultural land is erosion problems. According to the result, 63.8% had access to formal credit and saving institutions while others gain from local moneylenders as a source/s of credit about 20.4%. Majority of the respondent agree that, land shortage was strongly cause for food shortage with a 20.4% that, was next to low use of modern farm inputs that took 16.3%, then required Limited use of SLM practices and Soil fertility decline also the causes of starvation, inappropriate land plotting, and direct impact on SLM practices in which the level of SLM practices that leads to financial constraints, very poor institutional coordination, weak enforcement of rules and regulations, socio-economic and cultural factors and lack of awareness among the community. Thus, it was recommended that increasing the awareness of the community, responsible bodies (Government, Community and Agricultural Bureaus) should pay attention to the issue in order to improve the current poor SLM practices and to improve the food security of farmers in the Tarmaber Wereda.

Keywords: Sustainable land management practices, food security, household heads, soil erosion, soil productivity, *Tarmaber*, Ethiopia

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

One of the main pressing global ecological and developmental challenges of the 21st century is land degradation (Dumanski & Pieri, 2000), and that is mainly visible by soil erosion, deforestation, and loss of tropical forest. Thus, it is cautious as the main root cause for global economic loss as well. According to economic of land degradation initiative (2015), land degradation caused for loss of 10.6 trillion USD annually. This problem is more getting worse in sub-Saharan Africa as the most important factor for more than 180 million people affected (Vanlauwe *et al.*, 2014). Ethiopia is not exceptional with regard to problem related to land degradation. A recent report shows that about 14.3 million hectares of land in Ethiopia (about 50% of the Highlands) is severely degraded (Tesfaye *et al.*, 2016).

World, there is a concern in interpreting the degree of land degradation and desertification described in the global literature, because local communities frequently have age-old strategies that permit them to administer land, forest, uncultivated, and water resources at variable and interacting spatial and temporal levels. However, there is a compromise that it is far less expensive to prevent land degradation through the purpose of first-rate management based on both cultural and scientific understanding than to recover degraded land and that where land is degraded, important production and ecosystem service benefits can result from the rehabilitation of degraded lands (World Bank, 2006).

Still, there are limited prospects for expanding cropland area to meet the growth in demand for food and feed, due to competition with other land uses, and the risk of adverse impacts on climate and biodiversity from the conversion of forest, grassland and wetland to cropping. Sustainable intensification is thus seen as an important strategy to meet demand. Sustainable intensification refers to increasing production while improving the efficiency of resource use through the application of sound agro-ecology principles. Sustainable intensification has gained support as a logical response to deliver food security for a growing population through more efficient use of existing land resources (Beverley et al., 2018).

Sustainable land management (SLM) has emerged, not only because of the increasing population force on limited land resources and demanding for increased food production, but also by the gratitude of the fact that the degradation of land and water resources is faster rapidly in many countries in general and Ethiopia in particular. Planning and execution of SLM at the watershed level and even beyond land escape level is increasingly important to preserve ecological balance and integrity which in turn is indispensible for ensuring food security while avoiding degradation of land and water resources in the contrary. Innovative scientific knowledge detailing the amount and importance of ecosystem services and their roles in supporting humans and our agro-ecosystems is now becoming available. The societal and economic values of these services offer new opportunities for policies to support Sustainable land management (Yimer 2015).

SLM has vast potential for preservation and improvement of ecosystem services in all land use systems. Degradation of water, soil and vegetation, as well as gas emissions contributing to climate change can be limited by SLM practices that simultaneously protect natural resources and augment yields and SLM is defined as accepting based process that helps integrate land, water, biodiversity, and environmental management to gather growing food and fiber demands while beneath ecology services and livelihoods. SLM is necessary to meet the requirements of a growing population. Unsuitable land management can lead straight to land degradation and a important turn down in the productive and service functions of watersheds and landscapes (Bichaye, 2019). SLM is largely concerned with developing systems for attend to over consumption and the under-maintenance of natural resources, and accounting for the negative external and Environmental costs negative externalities that occur in land management decision-making. SLM Provides options to increase food security, enhance soil carbon appropriation, reduce surface runoffs, and maintain or increases local landscape biodiversity. Lessons learnt from the preparation and implementation of SLM projects (APEC, 2013).

At the equivalent time, extensive adoption of SLM has the potential to produce important public environmental goods in the form of climate change mitigation. The major benefit of implement SLM practices is predictable to be advanced and supplementary stable crop yields, increased system elasticity and, therefore, enhanced livelihoods and food security, and reduced production risk (FAO 2009). Crop growing production in developing countries should be enlarge to meet food demand for a rising population. Previous literature suggests that SLM may possibly

boost food production without degrading soil and water resources. Better agronomic practices consist of natural fertilization, lowest amount of soil disturbance and incorporation of residues, terraces, water harvesting and conservation, and agro-forestry (APEC, 2013). Crop growing production in developing countries should be enlarging to meet food demand for a rising population. Previous literature suggests that SLM may possibly boost food production without degrading soil and water resources. Better agronomic practices consist of natural fertilization, lowest amount of soil disturbance and incorporation of residues, terraces, water harvesting and conservation, and agro-forestry (APEC, 2013).

Over the past years, yearly government-led community mobilization has resulted in undertaking soil and water conservation work in large areas and in the plantation of hundreds of millions of tree seedlings in the Ethiopian Highlands. The Government of Ethiopia in collaboration with the World Bank and the Gesellschaftfur International Zusammenarbeit (GIZ) invested in a large program called the SLM Program (SLMP) (Schmidt & Tadesse, 2019). This program has been implemented in the last 10 years in four regions (Amhara, Oromia, Tigray, and Southern Nations, Nationalities, and Peoples' Region [SNNP]) of the Country (Abuye & Berhane, 2007; Ngondi *et al.*, 2011). The SLMP has been working in 177 watersheds and 209 *Woredas* to scale up and increase adoption of appropriate SLM technologies tested for specific agro-ecological conditions in the program watersheds (Schmidt & Tadesse, 2019). According to a recent study by Abera *et al.* (2020), Ethiopia invested more than US$ 1.2 billion per year over the past 10 years for land restoration. The existing pressing problem in the country led to the argument that SLM is required in Ethiopia to reverse the problem of land degradation and increase the country's economic growth and food security (Birhanu, 2014).

Tarmaber woreda of the Amhara region is one of the *woreda* where SLM program has been implemented. The *Woreda* is one of the hotspot areas in terms of soil erosion due to the very rugged topography with very steep slopes condition. This is mostly due to higher population growth, unimpeded environmental degradation, poorly developed infrastructure and the periodic drought. Likewise, the study *woreda is* one of the chronically and seasonally food insecure areas in the Amhara Region. The whole production is persistently insufficient to cover food necessity of the population. As a result, SLM practices have been introduced to address low agricultural

productivity and food security. This study is therefore intended to study the contribution of SLM practices on food security status of each household in *Tarmaber Woreda.*

1.2 Statement of the Problems

The agricultural sector in Ethiopia is the most significant sector for supporting growth and reducing poverty. It accounts for 50% of GDP, 88% of export value, and is a source of employment for more than 85% of the country's population of more than 70 million. However, lack of sufficient nutrient supply, the depletion of soil natural matter, and soil erosion are major barrier to sustained agricultural production (Menale, et al., 2008). The degree and magnitude of land degradations in the country are massive. For example, recorded measurements of soil loss by water erosion range from 3.4 to 84.5 tons per hectare per year with a mean of 42 tons per hectare per year (Hurni, 2000). According to the same source, there is a loss of 4 mm of soil a year, which is at least twenty times higher than the substitute rates.

Moreover, soil erosion by water is the most widespread form of land degradation. Estimates of average soil losses range between 3.4 and 84.5 t/ ha−1 yr−1 with maximum rates reaching 300 t/ ha−1 yr−1 (Teklemariam *et al.*, 2017; Abera *et al.*, 2020). Highest rate of soil loss was recorded on cultivated lands, ranging from 50 t ha−1 yr−1 (Adimassu *et al.*, 2012) to 179 t/ ha−1 yr−1 (Shiferaw & Holden, 1999). Due to the negative on-site impacts of soil erosion, the potential of agricultural intensification to enhance land productivity is limited (Gebrehiwot *et al.*, 2015). This nutrient depletion results in decline in agricultural productivity that continues to significantly affect the performance of the national economy (Haileslassie *et al.*, 2006).

In response to the land degradation challenge and its impact on food security, different efforts have been put in place. Ethiopia has also business enterprise into one of the principal land restoration efforts, with several soil and water conservation (SWC) and SLM program that have been put into practice across the country. Following the droughts of the 1970s, SWC work expanded in most parts of the Ethiopian Highlands (Dregne, 1985; Kebrom, 2001; Deininger, 2011). SLM in the Ethiopian context could be defined as the use of renewable land resources, for agricultural and other function to meet society needs, while at the same time ensuring the elongated term productive potential of these resources and the preservation of their environmental functions through systematic use of indigenous and scientific knowledge or

technologies, proper participation of communities on the decision making process and appropriate policy environments to ensure the successful implementation (Gete et al., 2006).

These efforts are believed to bring substantial change in restoring degraded land in the watersheds, improving agricultural productivity, food security and overall enhancement of ecosystem services of the watersheds. SLM practices improve agricultural productivity evidence on using reduced tillage, stone bunds, and chemical fertilizer in the Ethiopian highlands (Menale, etal., 2008). Characterizing scale-dependent spatial relationships between soil properties using multifractal techniques (Zeleke et al., 2006). Which are very far away from now however, such assessments do not guarantee to conclude about the Contribution of SLM Practices to Household Food Security in the case of *Tarmaber Woreda*. Therefore, this research is intended to fill the current literature gap related to The cntribution of SLM Practices to Household Food Security in the case of *Tarmaber Woreda*.

1.3 Objectives of the Study

1.3.1 General Objective

The main objective of this study is to investigate the contribution of SLM practices to household food security in the case of *Tarmaber Wereda* Amhara Region, Ethiopia.

1.3.2 Specific Objectives

More specifically, this study was designed to:

1. Describe food security status of rural households in the study area.
2. Identify socio economic and demographic factors affecting household's food security.
3. Assess the influence of households' participation in main SLM practices on food security status of households in the study area.

1.4 Research Questions

1. How do the socio-economic and demographic characteristics of households influence household food security*?*
2. What is the level of food security status of households who participated in SLM practices?

3. How does household's participation in SLM practices influence their food security status?
4. What are the main factors determining household's participation in different SLM practices in the study area?

1.5 Scope of the Study

In terms of content, this research is focus on (SLM) practices and their contribution to household food security of farmers around *Tarmaber Wereda*. In related manner (FAO,1993) SLM as a knowledge based process that helps integrate land, water, bio-diversity, and environmental management (including input and output externalities) to meet rising food and fiber demands while sustaining ecosystem services and livelihoods is the use of land resources such as soils, water, animals and plants for the production of goods; to meet changing human needs; while assuring the long-term productive potential of these resources, and the maintenance of their environmental functions. In terms of geographical scope, the research is conducted specifically in *Tarmaber Woreda*. The SLM pillar in general and SWC practices to implement in particular depend on objective realities existing at ground level where the intervention intended to take place. Three prominent soil and water conservation (SWC) practices have been known; biological and physical, agronomical, and these are the focus of the study. Biological practice of soil and water conservation work by their protective impact on the vegetation cover and dense vegetation cover like prevents splash erosion; reduces the velocity of surface runoff; facilitates accumulation of soil particles; increases surface roughness which reduces runoff and increases infiltration; the roots and organic matter stabilize the soil aggregates and increase infiltration, includes and Physical practices(Several physical conservation measures with the purpose of reducing surface runoff thereby increasing infiltration were implemented through public participation). The major agronomic soil and water conservations practices in Ethiopia are: Strip cropping, mixed cropping, intercropping, fallowing, mulching, contour ploughing, crop rotation, conservation tillage, and agro forestry (Mati, 2005).

1.6 Limitation of the Study

The researcher faced some challenges while doing this study. To begin with, the fact that the majority of the respondents‟ educational background is low creates some negligence in filling the questionnaire. Some did not give values to the questionnaire besides this; some others see the

questionnaire politically even though orientations had been making. Furthermore, since respondents have been in a tight work some were not as such willing to fill the questionnaires. Lastly, since the respondents were scattered in different sites, some difficulties were faced in giving orientations, following up respondents and collecting responses and the methodological factors strongly affects the research process Therefore, these conditions might affect the quality of the paper to some extents.

1.7 Ethical Consideration

Ethical considerations was seriously in use into account to make sure proper protection, honesty, anonymity, consents and other human fundamentals of the informants. Similarly, the participating respondents were not identified by names and their consent was required during questionnaire, interview and discussions. During surveys it is very important to make sure that the subjects are well informed about the research.

What is essentially it means that the subjects have the opportunity to leave the interview if they do not want to continue. In addition, the information on those who participate was confidential; therefore, all information collected that can identify a participant was well protected and the researcher shows the Addis Ababa University ethical clearance for respondents' confidentiality while the secondary sources were finding in libraries', internets and also properly acknowledge and cite all the sources in this thesis.

1.8 Significance of the Study

From this study, it is expecting to update the existing body of knowledge on the contribution of SLM to rural household food security status. It is presumed that the study provides information, which is useful for future proper planning and decision making in the region to improve food security and convene the objective of raising the livelihood of the society. In addition, the findings and recommendations of this study are useful to the government officials and extension workers at different level. This may assist them not to rely on simple personal experience or subjective expert judgment or tradition fashion in their management tasks but based on their strategies, decisions and actions on concrete knowledge of issues. The study can form as a basis for further research on how SLM practices contribute to enhance rural household food security.

1.9 Organization of the Study

The study is organized in five chapters. Chapter one covered introduction part, statement of the problem, objectivities of the study, research question, scope of the study, ethical consideration and significance of the study. Chapter two contains literature review, empirical literature review and conceptual framework chapter three was on methods of the study, research design, sample size determination, sampling technique, data collection tools and analysis. Chapter four was interpreted and/or discussed the findings/results, and the final chapter five was covered the conclusions and recommendations.

CHAPTER TWO: RELATED LITERATURE REVIEWS

2.1. Concepts and Definition of SLM Practices

The concept of SLM emerged in the years following the UNCED conference held in Rio de Janeiro in (1992). Because earlier approaches did not completely respond to the requisite of mitigating the syndromes of land degradation any more, the SLM concept comprise more participatory come close to and includes the communal and economic scope into the technical planning and design of land management approaches (Hans, 2000). SLM practices emerged later as a follow-up to the worldwide conversation on 'sustainable development' initiated by the Brundt land Commission. Sustainable development defined as development that "meets the needs of the present without compromising the capability of future generations to meet up their owner of needs" (WCED, 1987). The term 'Sustainable' has to be seen in all its dimensions, mainly the economic, social, institutional, political, and above all, the ecological dimension. The latter dimension form and continue to form the central part of the concept (Driessen, 1997). The term 'land' is a central element in the definition of SLM practices. In this paper, 'land' refers to natural resources, such as soils, water, and living organisms, which are existing in a pre-defined spatial unit (land units). Particular characteristics, such as ownership, resource availability, boundary situation, and the policy and economic environments, play an significant role for the assessment of 'land use types' and 'land use systems' (Bouma, 1997). Management in this approach defined as activity on the ground, using proper technologies in the respective land use systems. Following the sustainability model, 'appropriate' would require that a technology conforms to the five major pillars of sustainability, namely, it should be (1) ecologically protective, (2) socially acceptable, (3) economically productive, (4) economically viable, and (5) effective in reducing risk (Dumanski, 1994).

The "World Overview of Conservation Approaches and Technologies (WOCAT) defines SLM as the use of land resources, including soils, water, animals and plants, for the production of goods to meet" shifting human being needs, while concurrently make sure the long term productive possible of these resources and the safeguarding of their environmental functions. SLM activities that were implemented under different projects and programs to address themes like food security and environment issues under different ministries.

SLM refers to divers and long-running dispute over the direction of societal actions. It is the combination of technologies, policies and activities aimed at incorporate socio-economic principles with environmental concerns so as to concurrently sustain or enhance production, reduce the level of production risk, defend the potential of natural resources and avoid soil and water degradation be economically feasible and be socially acceptable (Eshetia, 2018). Obtaining locally applicable methodologies is a central concern of local stakeholders, researchers, and project planners. Aggregation of information at community to regional level would be very valuable for the co-ordination of action and for provided that a proportional analysis of local areas. A specific approach has been develop for this purpose, which is called 'sustainable development appraisal' (SDA). SDA is a methodological tool for the participatory assessment of sustainability from local to regional planning levels (CDE, 2000).

SLM has been defined by Africa partnership (2006) as the adoption of land-use system that through suitable land management practices make possible land users to maximize the economic and social benefits from the land while maintaining and rising the environmental support functions of the land resources. It encompasses managing of soil, water, vegetation and animal resources. According to the perspective of the World Bank, knowledge as a resource is equally important to be able to incorporate different management areas. Hence, Yimer (2015) defined SLM as a knowledge-based procedure that helps to integrate land, water, biodiversity and environmental management including input and output externalities to meet rising food and fiber demands while sustaining ecosystem service and livelihoods.

According to Turner *et al.* (2016), SLM is necessary to meet the requirements of a growing population and improper land management which could lead to degradation of land in a significant reduction in the production and service functions. The major objective of SLM is thus to integrate people's coexistence with nature over the long- term, so that the provisioning, regulating, cultural and supporting services of the ecosystem are ensured. This implies that SLM helps to augment average productivity, reducing seasonal fluctuations in yields, and under pinning diversified production and improved incomes.

SLM practices are agricultural practices that conserve and enhance production capacities of land for crops, livestock's, watershed and forest, and actions to minimize and reverse land

degradation and also they are necessary to meet the food needs of the growing population, rehabilitate degraded lands, adapt to and mitigate changing climate (Lal *et al.*, 2011).

SLM practices including diversified cropping systems integrated agronomic practice, structural soil erosion practices, soil management practices and cultivation practices like minimum tillage and conventional tillage are the most SLM practices and are a key mechanism for effective change in the sustainable use and management of land resources (Gurtner *et al.*, 2006). Overall SLM practices determined by the local context and particular situation of local stakeholders, it can be different from region to region and based on topographic condition (FAO *et al.*, 2011). SLM practices are ecological friendly, reduce recent land degradation, improve biodiversity and boost ability to become strong to climate change and enhancing of soil productivity. This is amazing to the fact that the practice enclose the combination of soil treatment including the application of mineral and organic fertilizer like animal dung with soil and water conservation measures implementation of agronomic, soil management and physical measures such as contour ridging, terracing or providing ground cover, use of plants and living crop residue thus like any limited resources, it is important to manage agricultural land because it is most suitable for farming (Dumanski,1997).

The foundation of the success of SLM often depends on the adaptability and the communal suitability of the practices by the affected communities. Sustainability among different communities may have a different level of social perceptions, various factors like knowledge and education; geographic variability, time and social affiliation may affect social acceptability (Anadon *et al.*, 2016).

2.2. Food Security and Insecurity

Issues about food security can traced backside to the Hot Springs Conference of Food and Agriculture in 1943, Since the 1974 Rome conference the whole concept has "evolved, developed, multiplied and diversified" (Odumegwu, 2018). According to Shaw (2007) held in Rome declared and broadly set the definition of food security as "all people at all times have physical, social and economic access to sufficient, safe and nutritious foods to meet their dietary needs and food preferences for an active and health life". Indicators of food security include availability of food, economic and physical access to food, adequate food utilization and sustainably having access to adequate food (FAO, 2008).

“Food security at the individual, household, national, regional and global levels is achieved when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life” (Schmidhuber & Tubiello, 2007). From this definition, the expression 'safe and nutritious' emphasizes food safety and nutritional composition while 'food preferences' indicates the change of the conception from simple access to access to the food preferred. This implies that people with equal access to food, but different food preferences, could show different levels of food security. This definition is again refined in the State of Food Insecurity Submit (2001) as a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary food preferences for an active and healthy life’(Burchi & De Muro, 2016). According to Marion N. (2010/2011) cited World Food Summit (WFS) in November 1996:, *“Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life”.*

Availability

At all times of adequate world food supplies of essential food stuffs to maintain a stable extension of food consumption and to counterbalance fluctuations in production and prices (United Nations,1975 Report of the World Food Conference, Rome 5-16 November 1974. New York).

Access

The World Food Summit defines access as having “physical, economic and social access”. Access is still not regularly accepted as a vital part of food security in spite of Amartya Sen’s introduction of the concept in the early 1980s. Many people only believe access within an economic or financial context, mostly since the 2005 Niger food crisis and the start of food price instability in 2008. The World Food Program defines food access as a household’s ability of the amount of food frequently from beginning to end a combination of purchases, barter, borrowings, food assistance or gifts (WFP, 2009).

Utilization

The World Food Summit's definition of utilization it is the third component of food security is safe and nutritious food which meets their dietary needs. The availability of and access to food on their possess are not sufficient, people have to be certain of "safe and nutritious food". The food consumed has to supply sufficient energy to make possible the consumer to carry out routine physical activities (Marion N. 2010/2011).

Stability

The World Food Summit says that stability have to be nearby "at all times" in terms of availability, access and utilization for food security to exist. The literature distinguishes sandwiched between chronic food insecurity where food needs can't be met over a protracted period and transitory food insecurity, when the time is temporary (Maxwell and Franken B. 1992).

Food insecurity describes when all people, at all times, require secure access to sufficient amounts of safe and nutritious food that meets their dietary needs and food preferences for an energetic and healthy life. For the extent of food insecurity, people are not consuming enough food for an active and healthy life. This may be outstanding to the unavailability of food, inadequate purchasing power or inappropriate consumption at household level (Ivers & Cullen, 2011). Food insecurity is defined as a situation in which people require the basic food intake necessary to make available them with the power and nutrients required for completely productive lives (Coates, 2013). Based on chronological dimension, two types of family food insecurity can distinguished as chronic and transitory. Chronic or permanent food insecurity is a constantly insufficient diet resulting from be short of of resources to fabricate or obtain food, while transitory food insecurity is a temporary turn down in the household to admission enough food (Nguyen, 1998).

2.3. Empirical Literatures and SLM Practices on Food Security

The major profit of put into practice SLM practices is expecting to be higher and more constant crop yields, increased system resilience and, therefore, enhanced livelihoods and food security, and reduced production risk. Soil degradation is reason to decline the crop productivity and vast economic loss, putting the food security and source of revenue of farmers at risk (Henry et al.,

2018). There is a straight link between land degradation and rural livelihood through three pathways. Firstly, the decline in soil fertility because of land degradation reduces farm productivity and income. As crop and livestock production is the major source of household income, the decline in soil fertility, throughout nutrient reduction and poor water holding capacity affects the on-farm income significantly through reduced agricultural productivity. Secondly, the decline in soil fertility affects the productivity of labor; a degraded land requires much more labor per unit area than well-managed land (Gashu & Muchie, 2018**)**.

The important land managing paradigm change in current years involves evaluation of the impacts of managing of land. For the reason that agro ecological landscapes are varied, farmers and land users have developed an extensive set of cropping and natural resource management strategies to cope with the variety of production and ecological situation. Sufficient treatment of the difficulty of agro ecological conditions and cropping systems is further than the scope of this report (World Bank, 2006).

Broad pathways of agricultural land use alter have evolved in developing countries reflecting diverse land resource gift and settlement patterns expansion and intensification of irrigated agriculture escalation of high quality rain fed lands Intensification of tightly populated minor lands expansion of farming into sparingly populated marginal lands, the increasing of urban and peri urban farming with accelerated urbanization. Land quality is an essential matter among the long run considerations related to global food supply and the total possible supply of supplementary cropland would be significantly less than the current supply of farmland. The role of increased irrigation water to agricultural production in selected countries would be sizeable but global supplies of irrigation water would be increasingly constrained, New and more productive varieties of food and other crops developed via advances in admission genetic substance from wild relatives and plant breeding are likely to supply to enhanced food supplies (World Bank, 2006).

Climate inconsistency would be continue but neither detract from nor enhance food production potential, assets rights clearly specified, well defined, and enforceable are relatively vital in assisting good resource managing directly or through proper policies and incentives, Based on prior yield improvements in cereals and decrease in environmental costs of agriculture, and

anticipating major breakthroughs in disease resistance and crop yield potentials, food supplies would be adequate to meet demand (World Bank, 2006).

2.4. Determinants on Participation of Land Management Practices

In the actual globe, there are several challenging factors influential the adoption and implementation of land management practices to avoid land degradation and to regenerate degraded land (Megersa, 2011). Government policies and programs, socio-economic and institutional factors, farmers' local knowledge and practices, households' endowments of physical and human capital as well as topography, soil type and climate are the most important factors that could influence land managing practices (Deressa *et al.*, 2011). Study conducted in Beressa watershed of Ethiopian by Amsalu (2006), identified that farmer's age, farm size, perceptions on technology, slope, livestock and soil fertility strongly have an influence in the implementation of stone terraces. Another study by Abebe & Sewnet (2014) identified that perceptions about soil erosion problems farmers' attitude towards a new technologies and participation on conservation training have important positive influence on farmers' decision to maintain conservation structures.

A study conducted by Demissie & Legesse (2013), in South Eastern Ethiopia identified that education level of household head, age of household head, family size, agro ecology, income, market access, extension service, access to credit, farming experience, livestock ownership, land holding size, sex of household, perception on soil fertility and training access to have an influence in the adoption of land management and identified that population growth, income level, urbanization, infrastructural development, policies at national and international level and land tenure and property rights are the major factors affecting SLM.

More over different factor determines food security status of Ethiopia. Access to agricultural extension services, off farm income, number of oxen owned, total land size and safety net participation are found to be the major determinants of household food insecurity and/or security that extensively diminish the level of HHFS. Whereas age dependency ratio, family size, crop disease incidence and fertilizer utilization are uncovered to be considerable and positive covariates of household food insecurity (Demissie & Legesse, 2013).

According to Sirajea & Bekeleb (2013), family size, age of household head, dependency ratio and livestock disease occurrence root causes for food insecurity while, sex of household head, herd size, income from livestock production and non-farm income were working against food insecurity.

A number of studies have covenant with significant influencing factors that elucidate the implementation judgment presentation of smallholder farm households on the way to various SLM measures. For example, a study conduct in northern part of Ethiopia by Adugna and Bekele (2007) revealed that economic variables such as family size, and land-to-labor ratio have an pressure on implementation of land conservation practices. Then the most important socio-economic factors that influence household's judgment to accept soil and water conservation measures in Ethiopian highlands include sex and education level of household head, availability of labor force, off or non-farm income (Adimassu and Kessler 2012). Age of the Household Head, This result suggests that older farmers are less likely to accept SLM practices. This could be explained by the fact that older farmers have a short planning perspective compared with younger colleagues (Anley et al. 2007).

Off-Farm Activities, implementation of SLM practices also found to be negatively influenced by off-farm activities. This is for the reason that farmers who are involved in off-farm activities may meet time and labor constraints for investing in bunds (Amsalu & de Graaff, 2007). Educational level of sampled household head, as hypothesized, education of the HH head was found to be positive and having a important influence on the implementation of improved soil conservation technology. This implies that longer schooling of the HH head increased their ability to access information, and strengthened logical capabilities with new technology (Lapar and Ehui 2004). Land tenure, Farmer's feeling about the land belongs to comprise a positive effect on decision to accept land management practices. The deficient in the title to land is one important factor affecting implementation of SLM Practices for the reason that lack of tenure security means that people are unenthusiastic to invest in new land management practices on a land which they do not officially own. consequently, farmers' perception that the farmland owns at least during lifetime affects the decision on land management practices.

Slope of the farm plots, this variable positively influenced the adoption of SLM practices or technologies at least the level of significance. The important positive terms in implementation of

conservation practices point to those farmers are inclined to spend in conservation practices where their farm plots are located on higher slopes. This goes with the awareness that those plots can only be productive if protected by conservation structures (Berhanu, and Swinton, 2003).

Sex, Labor availability, Livestock ownership, Environmental degradation and climate change, Farm size, Farm location, Food availability and access, food consumption and welfare, and biophysical constraints are among the principal challenges of promoting SLM in the country. On the other hand, the verification impact of these factors affecting SLM encouragement action has a mixed result. Constraints that have an effect on one SLM practice may not influence another one. For example land tenure insecurity may considerably affect long-term durable soil conservation investments such as terracing and fall owing than near term investments such as fertilizer and manure. In the same way, households with better education arc expected to comprise better awareness of new technologies and may be more likely to use new technologies. though, more educated households may be less prone to use labor- intensive SLM practices if they have higher. Labor opportunity cost as a result of better opportunities off the farm. At the same time access to Educational level of HHs, participation on off farm activity, Labor availability may facilitate use of agricultural inputs this leads to food insecurity for farm households (Mahmud and Pender, 2005).

2.5. Conceptual Frameworks

The conceptual framework presented in Figure 2.1 presented a few point about dependent and independent variables abstractly. In this regard, the essentials that were aligned determinant factors for rural household's participation in SLM practice including diversified cropping, integrated agronomic practices, structural soil erosion practices, soil management practices, and cultivation practices. Household participation in SLM practice, socio-economic characteristics and other demographic factors considered as independent variables. On the other hand, the dependent variable would be household Food security status of households.

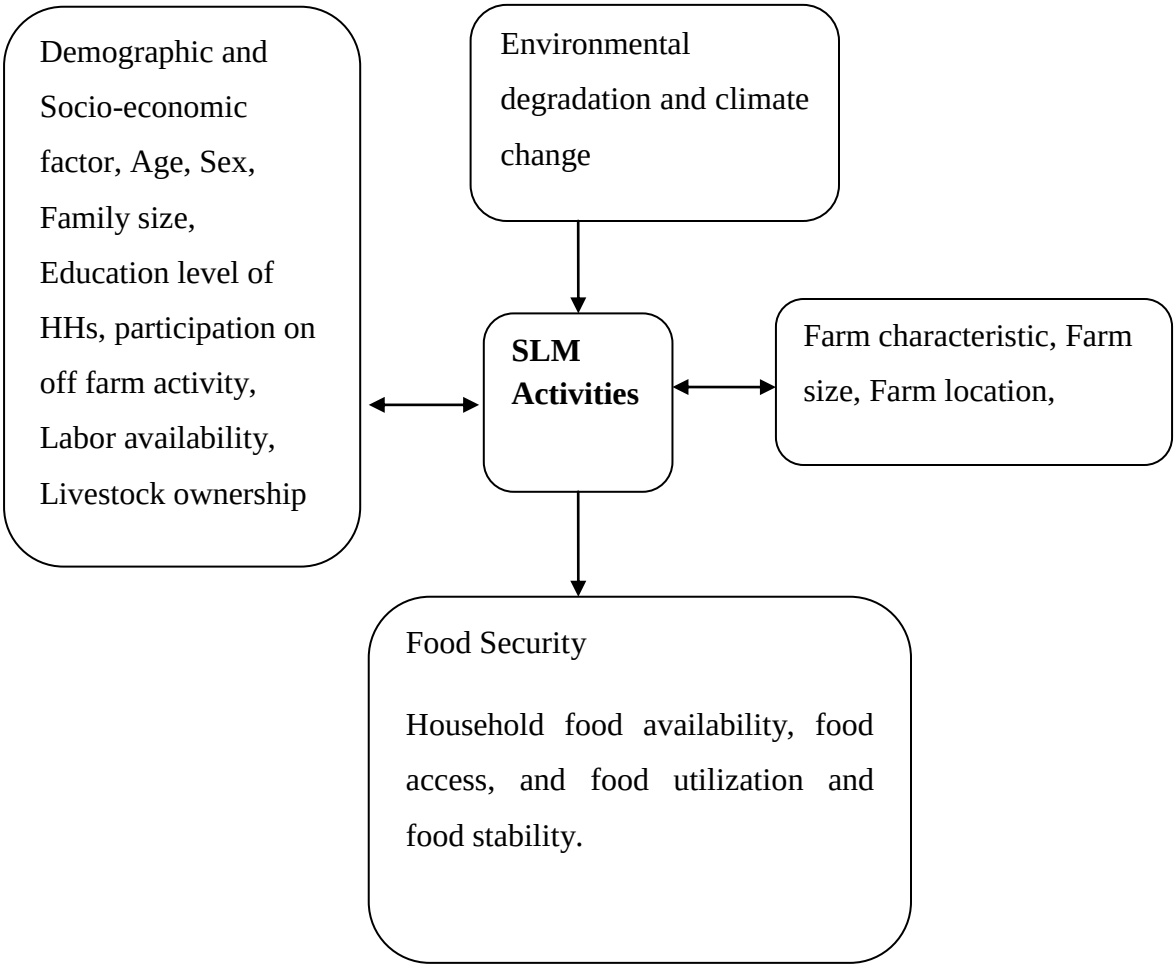

Figure 2.1; Conceptual framework on the contribution of SLM on rural household food security (Source; partially adopted from Getenesh, 2019).

CHAPTER THREE: DESCRIPTION OF THE STUDY AREA AND THE RESEARCH METHODOLOGY

3.1. Description of the Study Area

Tarmaber woreda is found in North Shewa Administrative Zone of the Amhara Regional state. Geographically, it's located at $9^0\ 44^{'}\ 0^{''}$ to $10^0\ 0^{'}\ 30^{''}$ N and $39^0 43^{'} 30^{''}$ to $40^0\ 0'0^{''}$ E. It is located about 60 km and 132 km from Debre-Berhan town and Addis Ababa, respectively. The mean annual temperature of the *Woreda is* estimated at 15.5 °C, with the mean minimum temperature of 8.2 °C and mean maximum temperature of 20.7 °C. The altitude of the area ranges between 1500 and 3100 m (Teketay and Bekele 1995).

According to the (CSA, 2007), *Tarmaber woreda* has a total population of 84,481, an increase of over the 1994 census, of whom 42,812 were male and 41,669 female; 10,304 or 12.20% are urban inhabitants. With an area of 543.33 square kilometers, *Termaber* has a population density of 155.49, which is greater than the Zone at average of 115.3 persons per square kilometer. A total of 19,993 households were counted in this *woreda,* resulting in an average of 4.23 persons to a household, and 19,370 housing units.

Tarmaber Wereda has two small towns, namely Debre Sina and Doqaqit. Administratively, the *woreda* is divided into 19 kebeles. Six kebeles of the woreda are located in low land, six kebels are located in midland, and the remaining seven kebeles are found in the highland areas. The economy of the *woreda* depends on agriculture and livestock production, where the main crops produced are barley, wheat, bean and *Teff*. The average yield of barley per hectare in T*armaber* has been estimated as 24 q/ha with the use of fertilizers. The recent wheat and bean yields have been estimated to be 14 - 16 and 8 –10 q/ha in 2005 respectively. Varieties of vegetables (onion, tomato, cabbage and potato) and fruits are additional produced in the Woreda with small-scale irrigation systems using river (Awulachew et Al., 2005).

In the highland of Ethiopia like *Tarmabe*r, livestock production system or animals are part of a mixed subsistence farming compound and livestock supply inputs like, draught power, transport, and manure to additional parts of the farm system and produce consumable or saleable outputs like, milk, manure, meat, hides and skins, wool, hair and eggs. The principal purpose of farmers engaged in mixed farming is to achieve complementary advantage from an most favorable

mixture of crop and livestock farming and distribution income and risks over both crop and livestock manufacture (Alemayehu, 1987).

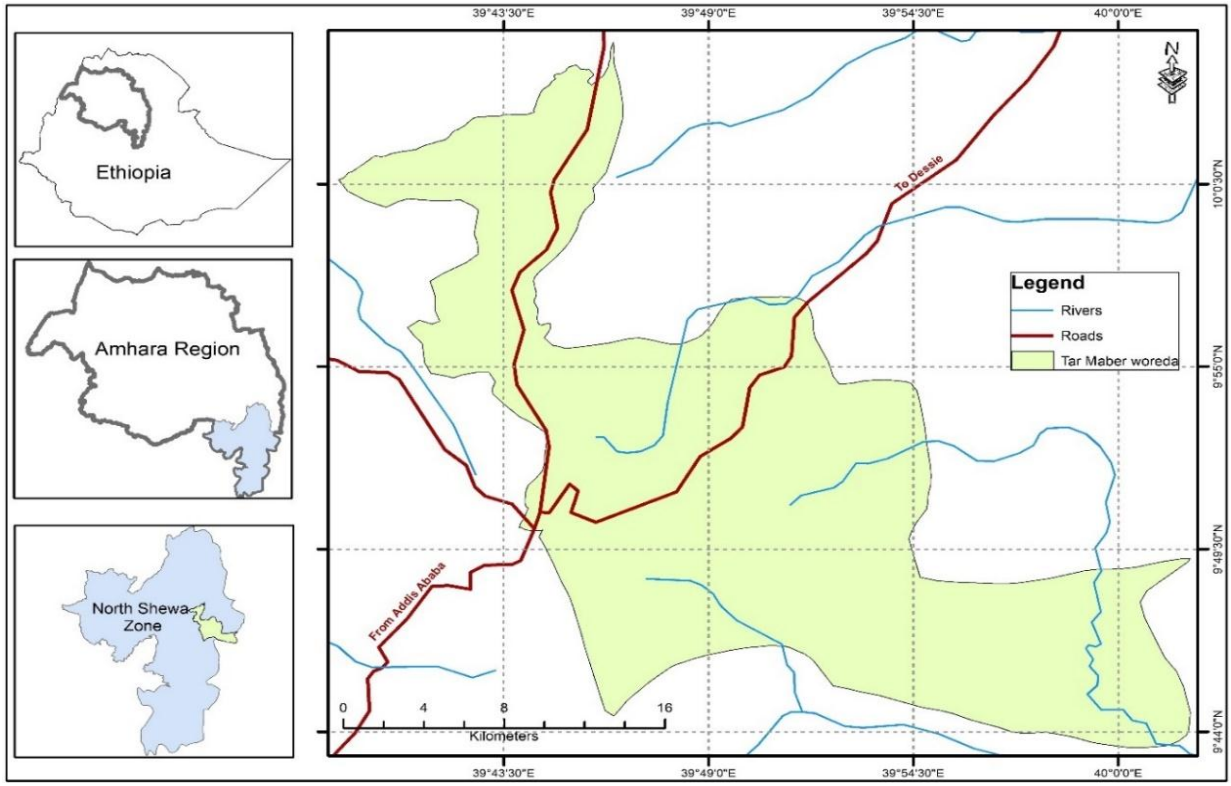

Figure 3.1. Map of Tarmaber Woreda (source; own construct)

However, loss of soil fertility and soil erosion are the major challenge to agricultural production in the area. The low soil fertility combined with the very steep slopes and rugged terrain potentially cause for high risk of soil erosion. In order to tackle the problems, farmers living in the *woreda* have been implementing various SLM practices in their fields. Some of the SLM practices implemented include terraces and Chemical fertilizers are also widely applied by the farmers. Additionally, small-scale irrigation has been practiced in the *woreda*. The source of water for irrigation is mainly from river diversion and from rain water harvesting. Irrigation systems based on river diversion has been holed up by World Vision Ethiopia, which further promote the improvement of rural livelihoods in several manners while livestock and livestock products have essential roles in generating cash, improving families' nutrition and also maintaining the productivity of the farmland through their manure. Farmers are now improving their households' nutritional status by providing eggs, meat, honey and milk for home

consumption. And farmers are also improving their families' nutritional status by the consumption of fruits and vegetables from their farms. Participating farmers have already harvested fruits like passion fruit. The vegetables preferred by the farmers are tomatoes, cabbage and onions, which are produced in large quantities for both domestic use and for sale (FAO 2017).

3.2. Research Methodology

3.2.1. Research Design

This study had employ a cross-sectional research design that used to prove and disprove assumption, not costly to carry out and does not involve a lot of time, captures exact point in time, contains several variables at the time of the data snapshot, the data can be used for diverse types of research (Maryam, 2015). In addition, a mixed (both quantitative and qualitative research approaches) is applied to explain and quantify the data in which have been used for triangulation purpose. A quantitative research requires that data expressed in numbers and qualitative approaches engage open-ended questions in order to get aspect information from the selected respondents. The research is descriptive research as it is describing the contribution of SLM practices to household food security in the case of *Tarmaber woreda*, Amhara region, Ethiopia.

3.2.2 Data Types and Sources

Both qualitative and quantitative types of data and primary and secondary sources of data collected from the study sites. The primary data is a data collected through field observation, questionnaires, and interviews. The primary sources of data were collected from rural household heads questionnaires and interviews conducted with agricultural officers and experts, *Tarmaber woreda* Bureau and other stakeholders. In this research secondary data include information obtained mainly from *Tarmaber woreda* agricultural finance reports, books, journals, and internet which are related to the aim of the study.

3.2.3 Sampling Techniques and Sample Size Determination

In this research, *Tarmaber woreda* was selected purposively. The reason for selecting *Tarmaber woreda* was that it is one of the hotspot areas in terms of soil erosion due to the very rugged topography with very steep slopes condition. As a result, low agricultural productivity and food security have been the main issues in the *woreda*. Hence, conducting research in the area was required to examine whether the implementation of SLM practices could potentially contribute to increase agricultural production in general and household food security in particular.

Then, a two stage sampling method was employed to select kebeles and sample households. At the first stage, 19 *Kebeles of Woreda* were stratified based on their agro-ecological conditions: lowland, midland and highland. Then, three *kebeles* (from each agro ecological condition) were purposely selected because all the 19th *kebele* classified on based on three common whether condition like, lowland, midland and highland so the researcher like to take one *kebele* from each different whether condition. Accessibility to transport services and availability of SLM practices in the fields of farmers were some of reasons for selecting the study *Kebeles*. Then 196 sample households from the selected three study *Kebeles* using simple random selecting techniques and 65, from the first, 65 from the second and finally 66 from the last one.

The sample size for collecting quantitative data for this research was determined by using Cochran's (1977), sample size determination formula.

$$n = Z^2pq/d^2$$

Where; n = denotes the sample size; Z is standard normal variable at required confidence level (Z statistics:1.96); d is the desired level of precision or level of statistical significance/margin of error the researcher wills to accept (0.05); p is estimated characteristic of target population variability of population parameters the researcher assumes, and q is 1-p. Taking in to consideration about 15% level of food insecurity (Getenesh, 2019, p.1) and 10 % non-response, it is determined to be 196.

3.2.4. Tools of Data Collection

Questionnaires were the main tool to collect primary data in this study. Accordingly, structured and semi-structured questionnaires were prepared to collect responses from household respondents. Besides, focus group discussion and key informants interview were employed to supplement the research finding with qualitative information.

3.2.4.1 Household Surveys

To generate quantitative information at a household level, household survey was undertaken by developing structured and semi-structured questionnaires by translating to their local language. This tool was designed in order to generate information on households' socio-economic and demographic attributes livelihood, land attributes, food security situations and its indicators, SLM practices related data and other important household characteristics.

To administer the respondents by using a household surveys after obtaining the consent of the respondents as a research ethics and 20 households were interviewee as complementary to the main distribution of questionnaire. In order to maintain the quality of data, scientific principles and guidelines during questionnaire designing, data collection, data filling, encoding, data entry and processing would be apply. Data collectors would be oriented on issues related to data collection procedures and ethics. Computer-based data cleaning can be carried to check for the completeness, consistency and accuracy of data and to identify errors that may occur during data collection or coding process.

3.2.4.2. Focus Group Discussions (FGD)

10 percent of the sample size/ 20 households join with 18 focus group discussion in different size were selected based on their education level, age, membership, gender, income, residence, position, participation or non-participation in a given program or intervention from each kebele. This tool was helped the researcher to get into direct contact with participants and generate data not only by recorded what they told but also by observed their feelings and the real atmosphere.

3.2.4.3. Key Informant Interviews (KII)

Key informant interviews with diverse group of people with specific knowledge on SLM practices were held. These informants were selected from the *woreda's* Agriculture and Rural Development Offices, Food Security Sector, Land administration Bureau, Development Agents (DAs) Kebele officials to Subject matter Specialists (SMS), progressive farmers, elderly, Farmers Training Centre (FTC) operators, researchers and people working in different subject matter, Community Based Organizations, Government Organizations and None Government Organizations are among people to be interviewed and 15 stakeholders were interviewed

3.2.5. Techniques of Data Analysis

The study employed descriptive statistics to analyze the data. Descriptive statistics such as mean, percentage, frequency and standard deviation were used to assess key variables as SLM practices interventions and different demographic and socio-economic characteristics of the households. Further, to determine the contribution of SLM practices to households' food security status in the study kebeles, thematic content analysis is one of the most common methods to analyze qualitative data and narrative analysis is method is used to analyze content from various sources, such as interviews of respondents, observations from the field, or surveys. SPSS and STATA were used as a tool the research was made use of household food insecurity access scale (HFIAS) to measure food access.

3.3 Study Variables

The dependent variable is something that depends on other factors and in these study practices of SLM is the dependent variable. It comprises measures and practices adapted to biophysical and socio-economic conditions aimed at the protection, conservation and sustainable use of resources (soil, water and biodiversity) and the restoration of degraded natural resources and their ecosystem functions which is, expressed as variable. The independent variable is a variable that stands alone and is not changed by the other variables that some bodies are trying to measure and their brief are shown in Table 3.1

Table 3.1. Summary of study Variables

Variable	Type of the variable	Expected relationship	Description of the variable
Age	Continuous	+/-	Ages of house hold in numbers
Sex	Binary	+/-	1 for female and 0 for male
Family size	Continuous	+/-	Size of household
Education	Continuous	+/-	0 for unable to read,1foronly read and write, 2 for formal education (primary
Perception of soil erosion as problem	Continuous	+/-	1OR 0
Perception on SLM practice profitability	Categorical	+/-	1 OR 0
Participation of off-farm activity	Categorical	-	1 OR 0
Farm size	Continuous	+/-	Total area of farm (cultivated land, grazing land, woodland, and bare land);(inha) or timad
Land tenure	Binary	+	1 if has feeling land ownership, 0 otherwise
Farm location	Continuous	-	Average distance to home to farm area (in walking minutes
Labor availability	Continuous	+	Number of full time HH member engaged on farm activity
Training on SLM practices	Continuous	+	1 if the farmer has been trained, 0 otherwise

Source my own understanding from different sources.

This table shows the variable in detailed with their Expected relationship and type of the variable

CHAPTER FOUR: RESULT AND DISCUSSION

This chapter presented the analysis of the survey data and interpretation of the results of the study, and it is divided into three sub-sections. The first sub-section presents the characteristics of respondents. The second sub-section presents factors affecting the implementation of SLM practices, and finally the third sub-section presents the food security status of the study households.

4.1. Characteristics of the study households

4.1.1. Demographic and socio-economic characteristics

Table 4.1 shows the sex and age profile of the respondents. About 18.4% of the study households were female, while 81.6% were male. From the total interviewee, male head households were larger in number because, most of males were working as SLM practices. Relating to age of respondents, about 29.6% were more than 58 years old. In addition, about 28.1% of respondents were found between 49 and 57 years, while 23% are found between 40 and 48 years. The remaining respondents (about 19.4%) or 38 of them were found between 22 and 39 years old. The results imply that large majority of study households are older farmers. According to Haile, (2005) age determine how active and productive the head of a household is. Older people have relatively richer experience of the social and physical environments as well as greater experience of farming activities.

Table 4.1 Sex and age of household heads

Variables		Frequency	Percent
Sex	Male	160	81.6
	Female	36	18.4
	Total	196	100.0
Age	22-30	16	8.2
	31-39	22	11.2
	40-48	45	23.0
	49-57	55	28.1
	58 and above	58	29.6

Source: Survey, 2020

Figure 4.1 shows the educational statuses of the respondents. It shows the majority of the respondents educational statuses are religious education learners. About 16.3% attend religious school, 15 % attended adult education. More than 50% of the study households attended formal education (elementary, secondary, high school and preparatory school). Only 6.6% and 8% of respondents illiterate and able to read and write, respectively (Figure 4.1). The results imply that majority of household heads had better educational status. Better schooling of the HH heads increases their potential to access information, and strengthened investigative capabilities with new technology (Lapar and Ehui 2004).

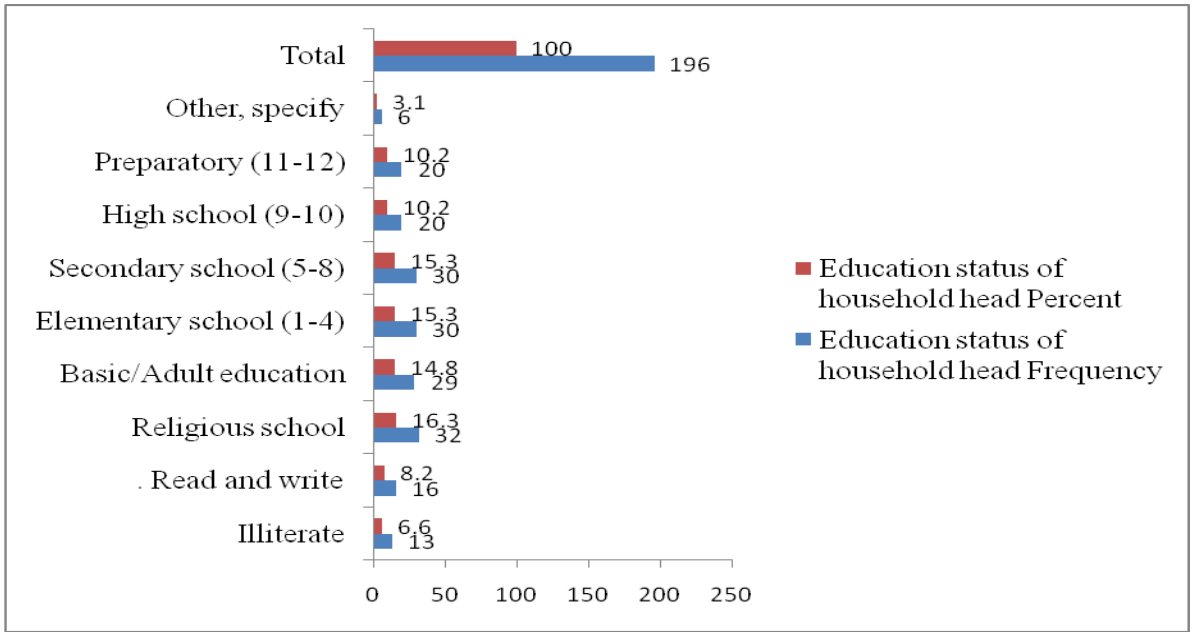

Figure 4.1 Education statuses of Households

Source: Survey, 2020

Large majority of respondents (95%) have access to land for agricultural uses (Table 4.2). Under subsistence agricultural production system, like in the study area, access to land for agricultural activities means more cultivation and more possibility of production, which in turn increase farm income and food security. According to Najafi (2003), food production can be increase extensively through expansion of areas under cultivation.

In addition, Table 4.2 shows that about 75.5% of the respondents are engaged in off-farm activities. This implies that majority of the study household tried to diversify their sources of income and earn more money. However, researches show that off-farm activities negatively

affects participation in SLM practices due to labor constraints for investing in these practices (Amsalu & de Graaff, 2007; Seblewengel, 2018).

Table 4.2 Economic activities of the study households

Variables		Frequency	Percent
Access to land for agricultural use	Yes	186	94.9
	No	10	5.1
	Total	196	100.0
Engaged in off-farm activities	Yes	148	75.5
	No	48	24.5
	Total	196	100.0

Source: Survey, 2020

4.1.2 Institutional Characteristics of Study Households

Table 4.3 presents the institutional characteristics of study farmers. About 95.4% of study farmers had contacted experts and development agents on crop and livestock production, soil management and technical advice. In addition, 98% of the study farmers obtained technical advice from extension workers during implementing SLM practices on farmlands. However, the results show that about 76.5% of the study farmers had access to extension services.

Relating to training on SLM, about 98% of study households responded that they attended training on SLM practices. Likewise, about 97% of them responded that they had access to credit services from different sources. The results show that about 64% of households who had access to credit services obtained from formal credit and saving institutions, while 20.4% of them had obtained from local money lenders (Table 4.3). Farmers were also asked whether they use credit for SLM practices or not. Large majority of respondents (about 82%) responded that they did not use credit for SLM practices. Only 18.4% of the respondents responded that they use credit to implement SLM practices. Concerning access to local market, about 46% of the study household respond that they have access to nearby market to sale their agricultural products.

Agricultural extension services have been emphasized by development experts as crucial in achieving agricultural development, poverty reduction, and food security However, empirical

evidence shows that in terms of the rates of return and the economic contribution of agricultural extension are estimated to be high and receiving at least one extension service visit per year reduces the likelihood of being poor by 10 percent in Ethiopia according to the experts response. But, extension systems and delivery methods in many developing countries have been critiqued as ineffective in responding to the demands and technological challenges of various types of clients and in reaching poor men and women farmers (Catherine, R. and et al., 2012).

Table 4.3 Contact experts on crop and livestock production, soil management and technical advice during SLM practices.

Variables		**Total Households (N=196)**	
		Frequency	**Percent**
Contact experts on crop and livestock production, soil management	Yes	187	95.4
	No	9	4.6
	Total	196	100.0
Technical advice during SLM practices	Yes	192	98.0
	No	4	2.0
	Total	196	100.0
Access to extension services	Yes	185	94.4
	No	11	5.6
	Total	196	100.0
Attended farmer-training course on SLM practices	Yes	192	98.0
	No	4	2.0
	Total	196	100.0
Access to credit services	Yes	190	96.9
	No	6	3.1
	Total	196	100.0
Source/s of credit	Formal credit and saving institutions	125	63.8
	Local money lenders	40	20.4
	Other	31	15.8
	Total	196	100.0
Use credit for SLM practices	Yes	36	18.4
	No	160	81.6
	Total	196	100.0
Access to local market	Yes	91	46.4
	No	105	53.6
	Total	196	100.0

Based on 2020 survey

4. 2 Perceived effects of after and before SLM practices on farmlands

4.2.1 Soil Erosion Problems after SLM Practices

Figure 4.2 shows the erosion problems on farmland after SLM practices implemented on farmlands. Large majority of the respondents' (about 92%) perceived that soil erosion on farmlands has been reduced after SLM practices (Figure 4.2). Only 3% of respondents perceived that soil erosion increases on farmlands after SLM practices have been implemented.

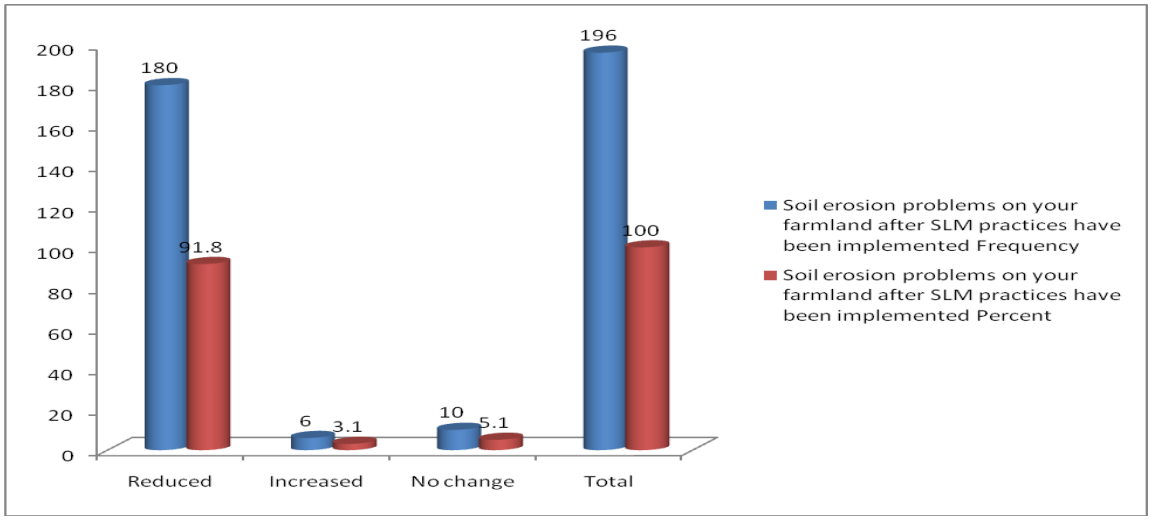

Figure 4.2. Erosion problems on farmland after SLM practices

Table 4.4 further shows that about 71.4% of study household perceived low erosion level after implementing SLM practices. Only 2.6% of them have perceived severe erosion on farmlands after SLM practices have been implemented on farmlands. The result imply that accelerating soil erosion can be reduced by implementing proper land management practices. Researches also show that appropriate soil and water conservation measures are among appropriate areas of intervention to mitigate the adverse effects of erosion (Wagayehu, 2003).

Table 4.4 Erosion level after implementing SLM practices

Variables		Frequency	Percent
Erosion level after SLM practices implemented	Severe	5	2.6
	Moderate	51	26.0
	Low	140	71.4
	Total	196	100.0

Source: Survey, 2020

4.2.2 Productivity of farmland after SLM practices

The results presented in Table 4.5 shows productivity of farmland after started using SLM practices. About 94% of respondents perceived that the productivity of farmland has been increasing after started using SLM practices.

Table 4.5 Productivity of farmland after started using SLM practices

		Frequency	Percent
Productivity of farmland after started using SLM practices	Increasing	184	93.9
	Decreasing	4	2.0
	No change	8	4.1
	Total	196	100.0

4.2.3 Perceived Erosion Level before Implementing SLM Practices

The Erosion level before implementing SLM practices in the study area were perceived as moderate (61.2%) and severe (30.6%). Only 8.2% of households perceived that erosion level on the farmlands before implementing SLM were low (Table 4.6). According to the interview with experts in the study area, there is limited awareness among farmers on implementing SLM practices, as they perceived that erosion level in the study area is low. Soil degradation is reason to decline the crop productivity and vast economic loss, putting the food security and source of revenue of farmers at risk (Henry et al., 2018).

Households' resource endowment mainly had the accessibility of labor force; land holding, crop production, and farm input utilization were found to have a pressure on the SLM practices. Besides, plot level characteristics for instance, soil fertility status, slope of plots, and location of the plot influence the SLM practices. Particularly, farm inputs, plot location, and distance to agricultural extension services are the most important forecaster for SLM practices in the study (Haftu E. and et al., 2019).

SLM practices including diversified cropping systems integrated agronomic practice, structural soil erosion practices, soil management practices and cultivation practices like minimum tillage

and conventional tillage are the most SLM practices and are a key mechanism for effective change in the sustainable use and management of land resources (Gurtner *et al.*, 2006).

Table 4.6 Erosion level before implementing SLM practices

Variables		Frequency	Percent
Erosion level before implementing SLM practices	Severe	60	30.6
	Moderate	120	61.2
	Low	16	8.2
	Total	196	100.0

Source: Survey, 2020

4.3. Determinants factors of SLM in the Study Areas

4.3.1 Perceived Consequences of Soil Erosion

Table 4.7 shows perceived consequences of soil erosion problems in the study area. The results show that 14.3% of study farmers perceived that erosion problems decrease soil depth and again 14.3% perceived that it causes difficulty for farming. In addition, 12.8% and 11.7% of farmers perceived erosion results reduced in agricultural production and decline in soil fertility, respectively. Reduced agricultural production (10.2%), changes in types of crop grown (9.2%), high concentration of stones on the top soil (8.2%) were also some of the perceived consequences of soil erosion problems.

Table 4.7 Effect of erosion problems in the study area

	Frequency	Percent
Decrease soil depth	28	14.3
Decline in soil fertility	23	11.7
Difficulty for farming (crusting)	28	14.3
Change in types of crop grown	18	9.2
Reduced agricultural production	20	10.2
Loss of agricultural farm land	25	12.8
High concentration of stones on the top soil	16	8.2
Reduced livestock fodder	20	10.2
Loss in livestock productivity	10	5.1
Increase the need for inorganic fertilizer	8	4.1
Total	196	100.0

4.3.2 Perceived Soil Fertility Status

The soil fertility concept has evolved to include integrated land and water management involving complementary organic and mineral sources of nutrients, crop and livestock diversification, and active links between indigenous knowledge and adaptive scientific research, backed by agricultural knowledge dissemination that involves farmer participation and, loss of soil fertility is the main factor affecting implementation of SLM practices on the farmland. Based on the data analysis, about 96% of the respondents perceived loss of soil fertility on their farmlands (Table 4.8). Again, results presented in Figure 4.3 shows that 65.3% of study household owned farmlands with medium soil fertility, while 18.9% owned farmlands with poor soil fertility. Hence, perceived soil fertility status could be one the determinant factors for implementing SLM practices in the study area.

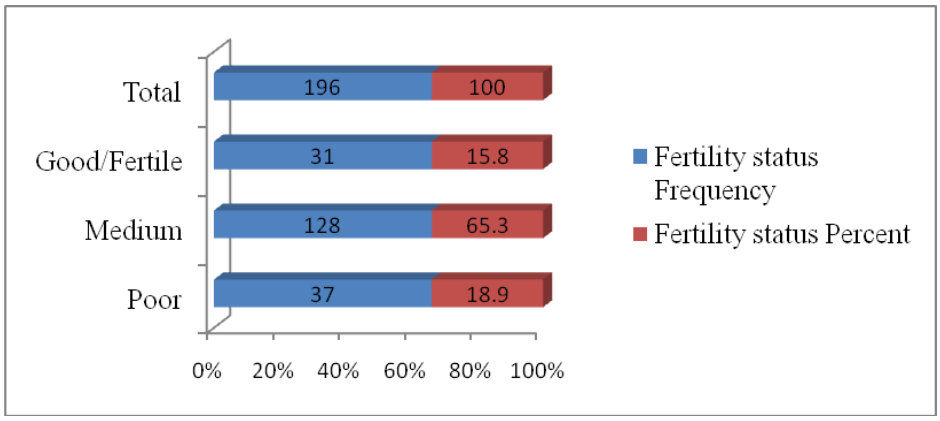

Figure 4.3 Fertility statuses of farmlands

Table 4.8 further shows that all of the farmers who perceived loss of soil fertility on their farmlands (96%) responded that the implemented SLM practices to maintain and replenish fertility of the soil by participating their family members.

Table 4.8 Perceived loss, maintaining and replenishing of soil fertility in SLM practices

Variables		Frequency	Percent
Perceived loss of soil fertility	Yes	188	95.9
	No	8	4.1
	Total	196	100.0
Maintaining and replenishing soil fertility	Yes	188	95.9
	No	8	4.1
	Total	196	100.0
Family member participate in SLM practices	Yes	188	95.9
	No	8	4.1
	Total	196	100.0

4.3.3 Perceived soil type

According to the data analysis, black soil type is dominant in the study area. About 84% of the study households perceived that they cultivated farmlands with black soil type (Figure 4.4). Similarly, 61% of households perceived that their farmlands were brown colour soil type.

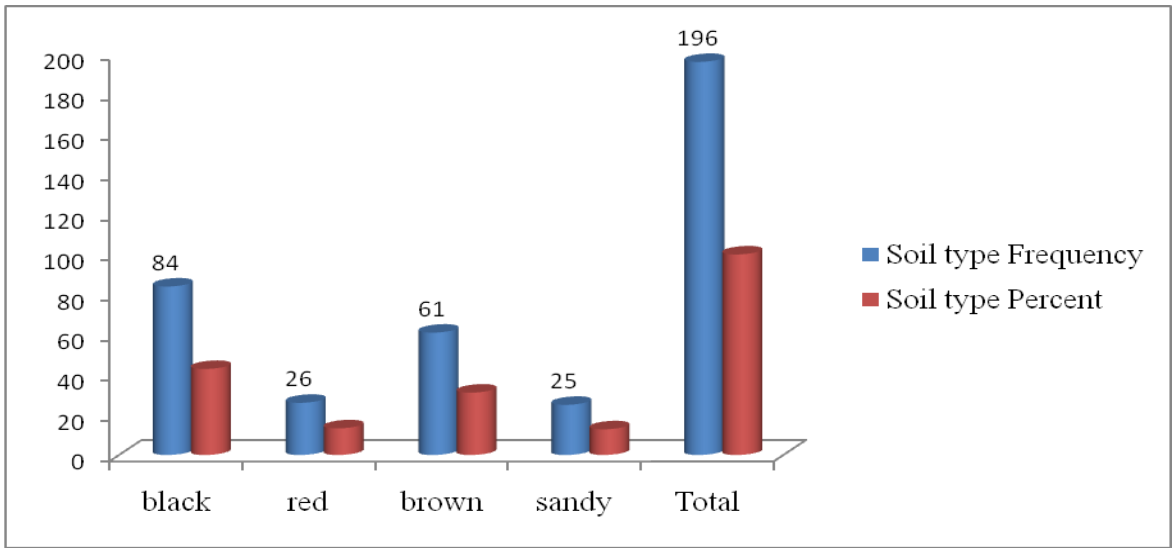

Figure 4.4 Soil type

4.3.4 Perceived soil depth

According to the data analysis, 49.5% of study households perceived that the depth of their soil is medium. The other Soil depth in the study area is shallow Soil depth with 71, 36.2% frequency and percentage respectively (Table 4.9). The next Soil depth in the study area is deep Soil depth with 28, 14.3% frequency and percentage respectively. Due to that in the study area in most, the Soil depth is medium.

Table 4.9 Perceived soil depth

Variable		Frequency	Percent
Soil depth	Shallow	71	36.2
	Medium	97	49.5
	Deep	28	14.3
	Total	196	100.0

4.3.5 Type of Crops Cultivated and Harvested and Human Activities

Figure 4.5 shows that type of crops cultivated and harvested settle on the implementation of SLM practices when crops cultivated and harvested the farmers should maintain their land regularly to sustain the land fertile and to get better production annually. According to the data analysis, the type of crops cultivated and harvested in the study area was *Teff* (24%), Barley (23%), Wheat (20.4%), Beans (10.7%) and Peas (9.7%). The result shows that *Teff* widely grown in the study area compared to other types of food crop.

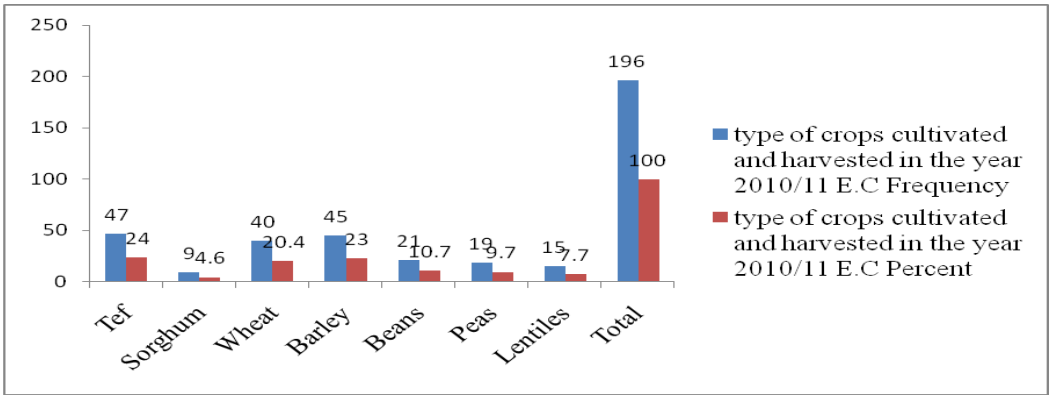

Figure 4.5 Soil Depth

4.3.6 Main Sources of Feed for Livestock and Human Activities

The results also shows that about 57.7% and 20.9% study farmers responded that they use communal grazing lands and crop residues as the main sources of livestock feed in the study area (Figure 4.6). About 10% of farmers also responded that open grazing is the main sources of livestock feed. Both communal grazing and open gazing system with proper management system will trigger erosion level on the farmlands, and hence determine implementation of SLM practices.

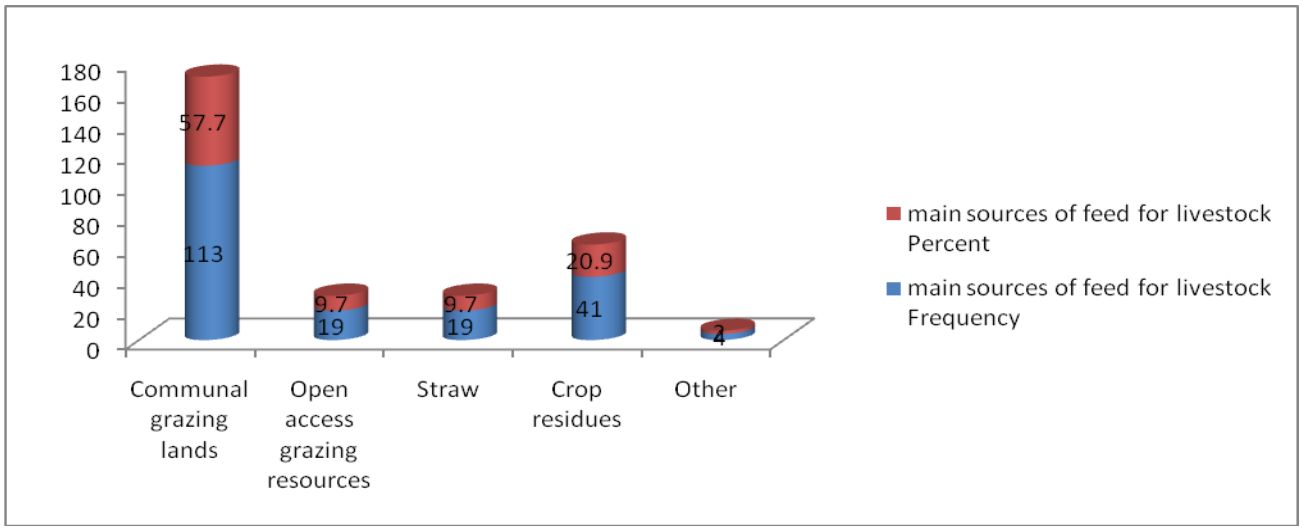

Figure 4.6 Main sources of feed for livestock

4.3.7 Farm tools used for building land conservation activities

Farm tools are important for constructing conservation activities on the farmlands. The results show that 95.4% of the study households have access to farm tools for building SLM practices (Table 4.10). Farmer with better access to farm tools would be in a better position to protect their farm plots from erosion and degradation, and hence implement SLM practices.

Table 4.10 Farm tools used for constructing conservation activities

Farm tools	Frequency	Percent
Yes	187	95.4
No	9	4.6
Total	196	100.0

4.4 The Food Security Status of Households before and after Implementing SLM

4.4.1 The Food Security Status of Households before Implementing SLM

The HFIAS model showed that only 4.08% households were food secure, while large majority of the, (95.9%) were food insecure. Among food insecure households, 39.8% were mildly food insecure, 50% were moderately food insecure and 6.12% of the respondents were severely food insecure (Figure 4.7). Food insecure people are not passive receivers of undesirable situations; they employ several strategies to make ease of the situations. Therefore, when hazards or undesirable conditions happened, people try to cope with and not rely much on outsiders, unless and other-wise, everything becomes out of their control (Bichaye, 2019).

The access aspect of food security embraces the ability of households or individuals to access food from the market or other sources and access to food is decide by a physical access or from other livelihood options. The economic section, on the additional offer, refers to "any achievement pattern or entitlement through which people procure their food" An significant factor here is the income of people and, in case of subsistence households, the assets essential to produce sufficient food for consumption, such as land, labor, water, seeds or fertilizer, indicators for households food access are land use practice, dietary changes, livestock sales, sales of the asset, change of food source, access to loan or credit, income diversification and livestock resource are among others (FAO 1999/2013).

SLM helps integrate land, water, biodiversity, and environmental management to meet rising food and fiber demands while sustaining ecosystem services and livelihoods. SLM is necessary to meet the necessities of a rising population. Inappropriate land management can guide to land degradation and an important decrease in the productive and service functions. SLM involves preserving and enhancing the productive capabilities of land in cropped and grazed areas and maintaining the reliability of watershed for water supply and hydropower generation needs and water conservation zones and the potential to serve the needs of farm and additional productive activities (Yimer, M. 2015).

The Ethiopian economy has its foundation in the agricultural sector. This sector continues to be essential machine for poverty reduction, food security, and fueling economic growth. On the other hand, the sector continues to be undermined by land degradation in the form of depletion of soil organic matter, soil erosion, and lack of sufficient plant nutrient supply (Pender et al., 2006).

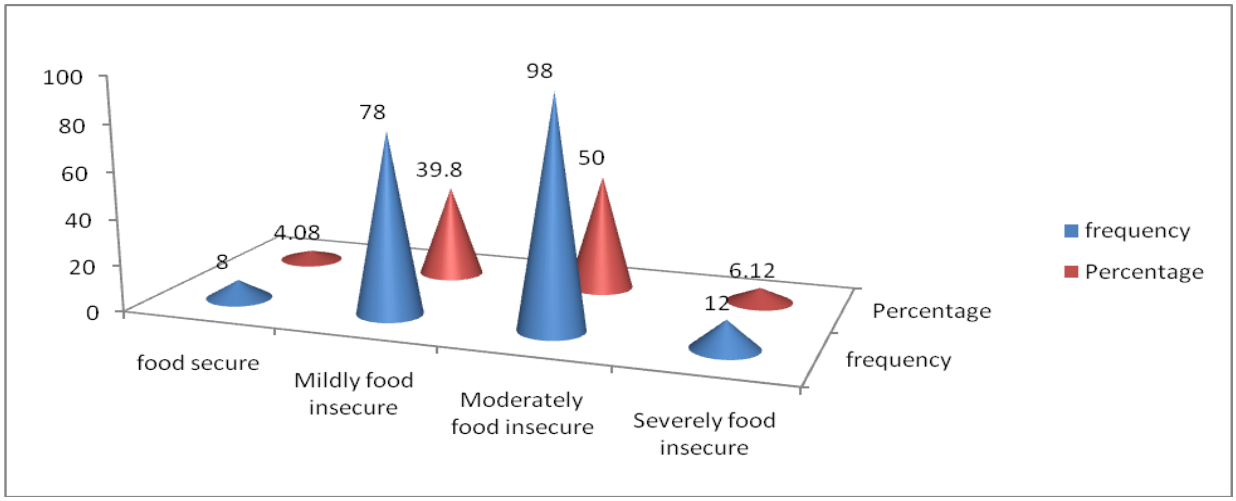

Figure 4.7 the food security status before implementing SLM

Source: Survey, 2020

4.4.2 The Food Security Status after Implementing SLM

According to the analysis of data of HFIAS model, about 6.35% of households were food secure after started implementing SLM practices on their farmlands. The result implies 2.27% improvement in food security status of the study households after implementing SLM. This improvement could be due to reduced soil erosion and improved soil fertility after implementing SLM practices. Again, large majority of farmers (93.65%) are food insecure. Among food insecure households, 42.06% were mildly food insecure, 48.47% were moderately food insecure and 3.12% of the respondents were severely food insecure (Figure 4.8).

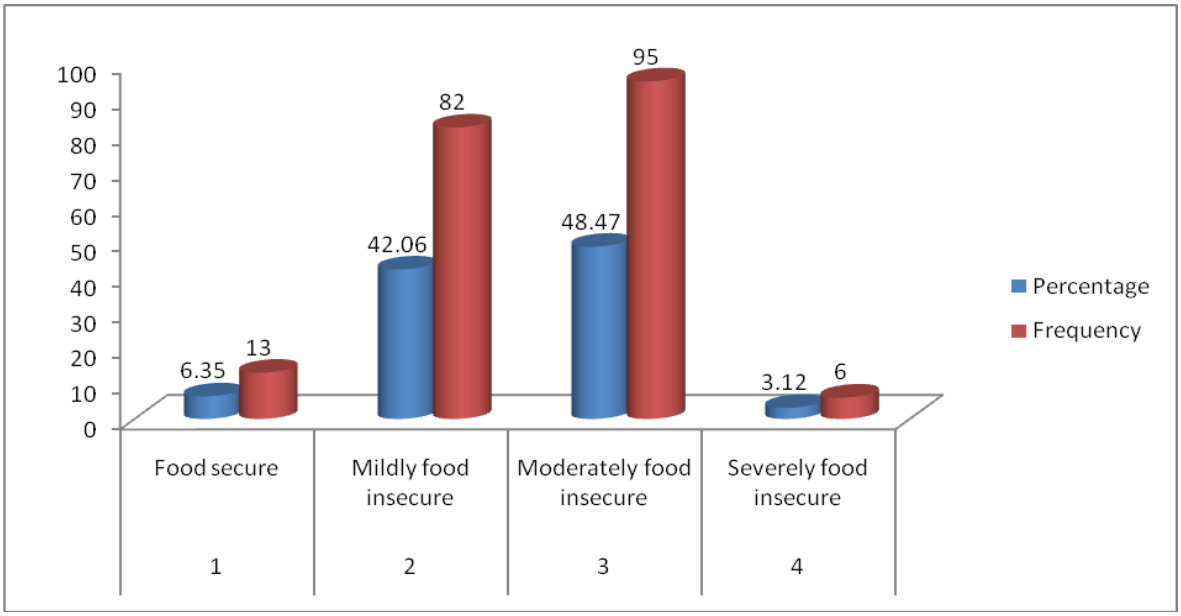

Figure 4.8 Percentage and frequency of food security of HFIAS

Source: Author construction based on surveys, 2020

4.4.3 Coping Mechanism of Study Households during Food Shortages

Table 4.11 shows coping mechanism used when households have-not enough food or money to buy food. About 15.8%, 13.3% and, 10.7% of food insecure households were mainly relied on selling small animals, migrating to other rural areas for wage labour and consuming less preferred food, respectively. This implies that large number of study households sale small ruminants and work in other places to earn additional income to cope during food crises. According to literature, households adopt both ex-ante and ex-post coping strategies in their endeavour to be food secure (Seblewengel, 2018).

Sustainable land management in general leads to increased yields, although the amount and variability of results varies by precise practice and agro-climatic conditions. Yield effects are in some cases negative for improved fallows, terraces, minimum tillage, and live fences. Whereas, positive yield effects are observed consistently for cover crops, organic fertilizer, mulching, and water harvesting. Yields are also generally higher in areas of low and variable rainfall (Maria, 2013)

Table 4.11 Coping mechanism when you have-not enough food or money to buy food

	Frequency	Percent
Changing cropping pattern	16	8.2
Migrating to nearby town for wage labour	14	7.1
Consuming less preferred foods	21	10.7
Borrowing grains from relatives	10	5.1
Borrowing grains or cash from money lenders	13	6.6
Migrating to others rural areas for wage labour	26	13.3
Selling off small animals	31	15.8
Selling grass and firewood	16	8.2
Rely on relief grains	15	7.7
Sell off farm oxen	20	10.2
Leasing out land	4	2.0
Engaging in petty trade	10	5.1
Total	196	100.0

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Summary

According to the result of this research, the majority of the respondents are aged due to that they resist accepting SLM. Older farmers are less likely to adopt SLM practices. This could be explained by the fact that older farmers have a short planning perspective compared with younger colleagues. They are traditional /religious and elementary educated farmers (16.3% and 15.3%) respectively due to this reasons applying SLM practices are low even if the majority of the respondents about 98% of them attended farmer-training course on SLM practices. The effectiveness of SLM practices is the combination of technologies, policies and activities aimed at integrating socio-economic principles with environmental concerns so as to simultaneously maintain or enhance production, reduce the level of production risk, protect the potential of natural resources and prevent soil and water degradation be economically viable and be socially acceptable.

Results also show that farmers have access to agricultural land but their land is not productive, less fertile, small size farmland and with severe erosion problems. Specifically, sustainable land management practices seem to be more effective at increasing crop yields in low fertility. The result of the data analysis shows that fertility status of farmland in the study area. According to the data analysis, the major type of crops cultivated and harvested in the study area are *Teff*, Barley and Wheat. The main benefit of implementing SLM practices is expected to be higher and more stable crop yields, increased system resilience and, therefore, enhanced livelihoods and food security, and reduced production risk. According to the respondents', 63.8% of them had access to formal credit and saving institutions while others gain from local money lenders as a source/s of credit registered.

5.2 Conclusions

According to the result, *Tarmabere woreda* farmers, food security status is insecure because, most of the farmers are leading there life Selling off small animals, migrating to others rural areas for wage labour, consuming less preferred foods, Selling grass and firewood, changing cropping pattern, borrowing grains or cash from money lenders and borrowing grains from relatives these is the main indicators of low food security status of rural households in *Tarmaber Woreda*. Majority of respondents or 82% of them did not use credit for SLM practices. Only small percentage of they use credit to implement SLM practices. Concerning access to local market, about 46% of the study household respond that they have access to nearby market to sale their agricultural products.

The Erosion before implementing SLM practices in the study area was perceived as moderate. Only small amount of households perceived that erosion on the farmlands before implementing SLM were low. There is limited awareness among farmers on implementing SLM practices, as they perceived that erosion in the study area is low and soil degradation is reason to decline the crop productivity. Results imply that, researches shows off-farm activities negatively affect participation in SLM practices due to labour constraints for investing in these practices. Male head households were larger in number because, most of males were working as SLM practices. Relating to age of respondents, the results imply that large majority of study households are older farmers.

Further reviews of yield and mitigation effect to economic analysis of the costs and barriers to adoption of SLM practices. This are essential to understanding the trade-offs of LM implementation and ultimately its viability in supporting sustainable intensification. Other forms of agricultural expansion, such as permanent cropping or cattle are ranching, appear equally or more significant in most regions, though the agro-ecological and policy factors influencing this cause of forest loss vary considerably across regions. There is evidence of positive effects from conservation measures in some areas, especially within lower-rainfall regimes. Low levels of land productivity and subsequent land and resource degradation could be terracing to inadequate access to the best or most appropriate knowledge required to overcome local constraints. Soil conservation measures have relied largely on food-for work programs as an incentive and have

been oriented toward labour-intensive activities such as terracing, bund construction, and tree planting.

5.3 Recommendation

- Agricultural experts should create strong relationships between farmers and other concerned people to conserve natural resources, especially farmland soil conservation and grazing land, giving effective training related to applying of modern agricultural technology to increase productivities and assure food security of the households. The stakeholders would be support and integrate with farmers to get access of credit from load and credit institutions to reduce the farmer's problems and to adopt of SLM practices with essential technologies.

- The *Tarmaber Worda* communities should participate in the program of Sustainable Land Management Practices (SLMPs) that are both farmland and grazing areas. In particular, specific program should designed for various land management practices that meet the peculiar needs of various categories of farmers. The government should be achieve the social benefits of natural resource conservation, there is a need for aggressive program to tackle the problem of low level of education, poor participation in community organizations and government initiated soil conservation program.

- NGO and professionals would provide better information to technology developers and farmers to stimulate the adoption of both soil conservation technologies and improved land management practices. Technology developers and farmers may lack information about cropping patterns and practices that might serve the priorities of farmers and at the same time contribute to soil conservation. This information could be to focus technology development efforts.

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ANNEXES

Questionnaire

Dear respondent,

My name is Etifwork Girma. I am MSC student in Addis Ababa University, Center for Food Security Studies. Currently, I am working on my Master‘s thesis entitled the contribution of Sustainable Land Management to Household Food Security in the case of Tarmaberworeda, Amhara Region. The objective of this questionnaire is to collect the primary data on household socio-economic and institutional characteristics and other related information to help me understand the contribution of sustainable land management practices to household food security in the study area. Household head is the respondent of this questionnaire. Your responses to the questions are valuable and will be held in utmost confidentiality to be used only for the analysis of this research. In this Study, you and I would have a short discussion of about 20-30minutesonlyandIamaskingyou to help us. You will not be identified by name in any case. If you accept to participate in this research, you will be doing so voluntarily and there will not be any monetary returns.

Code No.:_____ Name of data collector: _____ Kebele: _____ Date:_____

Part I: Demographic and Socio-economic characteristics

No	Questions		Code
1.	**Sex of household head:** 1. Male 2. Female		
2.	**Age of household head in years**		
2.1.	**Education status of household head**: 1. Illiterate 2. Read and write 3. Religious school 4. Basic/Adult education 5. Elementary school (1-4) 6. Secondary school (5-8) 7. High school (9-10) 8. Preparatory (11-12) 9. Other, specify		
3.	**Family size**		
3.1.	Number of family members in the household	1. Male	
		2. Female	
		3. Total	
4.	**Labor available**		
4.1.	Number of permanent family labor for farming activities at time of survey	1. Male	
		2. Female	
		3. Total	

5. Do you have access to land for agricultural use? 1. Yes 2. No
6. If 'yes' to question #5, what is the total size of your farmland that you use currently? _____ (ha/timad/gemed) and total number of plots you owned _____

7. Would you please tell us the characteristics of each of your farm plots where stone bunds have been implemented?

No	Characteristics	Farm plots							
		Plot1	Plot2	Plot3	Plot4	Plot5	Plot6	Plot7	Plot8
1.	Size of the plot in (timad/gemed)								
2.	Erosion level before implementing SLM practices: 1. Severe 2. Moderate 3. Low								
3.	Erosion level after SLM practices implemented:1. Severe 2. Moderate 3. Low								
4.	Slope gradient: 1. Flat 2. Gentle 3. Steep								
5.	Fertility status: 1. Poor 2. Medium 3. Good/fertile								
6.	Soil type:1. Black 2. Red 3. Brown 4. Sandy								
7.	Soil depth: 1. Shallow 2. Medium 3. Deep								
8.	Approximate distance from home (minute or hour)								

8. Would you tell us the type of crops you cultivated and harvested in the year 2010/11 E.C.)?

9. Would you also tell us the amount of crop products you sold out in quintals or Kgs and total income obtained?

No	Types of crops cultivated	Amount harvested in quintal or hectares
1.	Tef	
2.	Sorghum	
3.	Wheat	
4.	Barley	
5.	Beans	
6.	Peas	
7.	Lentils	
8.	Chickpeas	
9.	Other, specify	

10. Do you have farm oxen? 1. Yes 2. No
11. If 'yes' to question number 9, how many oxen do you have in number? _____
12. Do you have other livestock resources? 1. Yes 2. No
13. If 'yes' to question number 11, would you tell us their number?

14. What are the main sources of feed for your livestock?

No	Feed source	1. Yes 2. No
1.	Communal grazing lands	
2.	Open access grazing resources	
3.	Straw	
4.	Crop residues	
5.	Other, specify	

15. Do you have farm tools used for constructing conservation activities? 1. Yes 2. No
16. If 'yes' to question number 12, would you tell us their number?
17. Do you or any of your household member engaged in off-farm activities? 1. Yes 2. No

18. If ‘yes’ to question #16, would you tell us about the type of activities and number of persons engaged?

No	Type of off-farm activities	1. Yes 2. No	Number of persons engaged	Estimated income obtained
1.	Petty trades			
2.	Weaving			
3.	Wage labourers			
4.	Handicrafts			
5.	Other, specify			

Part II: Household Institutional characteristics

1. Do you have access to extension services? 1. Yes 2. No
2. If your response is ‘yes’ to question # 1, what types of services did you get? 1. Improved crop production 2. Improved livestock production 3. Improved input supply and use 4. Other, specify
3. Have you contacted development agents and/or other agricultural experts on crop production, livestock production and soil management? 1. Yes 2. No
4. If ‘yes’ to question #3.How often do you contacted them per year? 1. Every week 2. Twice every month 3. Every three months 4. Twice a year 5. Once a year 6. Other, specify
5. Did you obtain technical advice from extension workers during implementing SLM practices on your farmland? 1. Yes 2. No
6. Have you ever attended farmer-training course on SLM practices? A) Yes B).No
7. If yes to question #6, do you think the training was helpful for your Practical SLM work? A)Yes B)No
8. Do you have access to credit services? 1. Yes 2. No
9. What is the source/s of credit? 1. Formal credit and saving institutions 2. Local money lenders 3. Other, specify
10. Did you use credit for SLM practices? 1. Yes 2. No

11. If yes to question #10, for what purpose did you use credit (multiple response is possible)
    A. To purchase fertilizer B. To purchase seed C. To purchase livestock D. To implement SLM practices E. For fattening F. To start-off/non-farm business G. Other, specify_____
12. Do you have access to local market in your area to sell your produce? 1. Yes 2. No
13. What is the distance to the local market from your house (walking in hour)?)_____

Part III: Household head perception soil erosion, soil fertility and sustainable land management practices

1. Do you think that there is soil erosion problem on your farm land? 1. Yes 2. No
2. If your response is 'yes' to question number 1, do you believe that soil erosion is a cause for food insecurity in your area? 1. Yes 2. No
3. If your response is 'yes' to question number 2, indicate what you have perceived in respect to erosion problems?

   _____

   ___
4. What do you think are the consequence of erosion problems? (Multiple response is possible)

No	Consequence of erosion problems	1. Yes 2. No
1.	Decrease soil depth	
2.	Decline in soil fertility	
3.	Difficulty for farming (crusting)	
4.	Change in types of crop grown	
5.	Reduced agricultural production	
6.	Loss of agricultural farm land	
7.	High concentration of stones on the top soil	

8.	Reduced livestock fodder	
9.	Loss in livestock productivity	
10.	Increase the need for inorganic fertilizer	
11.	Other, specify	

5. How do evaluate the trend of soil erosion in this area? A)Increase B)Moderate C)Decrease
6. Do you believe that soil erosion can be controlled? A) Yes B)No
7. Do you have experience in protecting/managing your farmland from erosion problems? A. Yes B. No
8. If 'Yes' to question # 7, which of the following SLM measures do you practice to protect/manage your farmland from erosion?
9. Do you perceive that there is loss of soil fertility on your farmland? 1. Yes 2. No
10. If 'yes' to question #9, what do you think are the causes of soil loss on your farmland? (Multiple response is possible)
11. Do you have experience in maintaining and replenishing soil fertility of your farmland? 1. Yes
    a. No
12. Do you and your family member participate in SLM practices undertaken in your kebele? A)Yes B)No
13. If 'yes' to question #13, how did you participate? A) Voluntary b)Without interest/compulsory c)With incentive (Cash or Food for Work)
14. Did you maintain SLM practices implemented on your farmlands? A)Yes B) No
15. How do you rate the trend in soil erosion problems on your farmland after SLM practices have been implemented? 1. Reduced 2. Increased 3. No change
16. How do you rate the productivity of your farm land after you have started using SLM practices? 1. Increasing 2. Decreasing 3. No change

Has the productivity of crop yield increased since you have started implementing SLM practices? 1. Yes 2. No

17. If yes to question #18, would you tell us the type of crop grown, amount of inputs applied for each crop, and yield obtained before and after implementing SLM practices?
18. Do you believe SLM practices can ensure food security for long-term? A) Yes B) No
19. If 'yes' to question number 20, how can SLM practices ensure food security?

    _____

20. What are the major constraints to implement SLM practices in your area?(Multiple answers possible)
    A. Difficult to constructing introduced technologies
    B. Required too much labor to construct bund
    C. Decrease farmland/difficult to plow
    D. Poor agricultural extension service
    E. Not understand erosion impact on crop
    F. Others, specify_____

Part IV: Household Food security assessment and coping mechanism

HFIAS Measurement tools

1. Read each statement carefully and respond to each item by expressing your degree of agreement or disagreement by writing 0, 1, 2 or 3 in the rectangle marks.

For each of the following questions, consider what has happened in the past 30 days. Please answer whether this happened never, rarely (once or twice), sometimes (3-10 times), or often (more than 10 times) in the past 30 days?			
No	Questions	Responses options	code
1 1.a	Did you worry that your household would not have enough food? How often did this happen?	0= No (skip to Q2), 1= Yes, go to frequency 1= rarely (once or twice in past 30 days) 2= sometimes (three to ten times in past 30	☐

2 2.a	Were you or any household member not able to eat the kinds of foods you Preferred because of a lack of resources? How often did this happen?	0= No (skip to Q3), 1= Yes, go to frequency 1= rarely (once or twice in past 30 days) 2= sometimes (three to ten times in past 30 days)	
3 3.a	Did you or any household member eat just a few kinds of food day after day due to a lack of resources? How often did this happen?	0= No (skip to Q4), 1= Yes, go to frequency 1= rarely (once or twice in past 30 days) 2= sometimes (three to ten times in past 30	
4	Did you or any household member eat food that you preferred not to eat because a lack of resources to obtain other types of food?	0= No (skip to Q5), 1= Yes, go to frequency 1= rarely (once or twice in past 30 days) 2= sometimes (three to ten times in past 30 days)	
5	Did you or any household member eat a smaller meal than you felt you needed because there was not enough food?	0= No (skip to Q6), 1= Yes, go to frequency 1= rarely (once or twice in past 30 days) 2= sometimes (three to ten times in past 30	
6 6.a	Did you or any household member eat fewer meals in a day because there was not enough food? How often did this happen?	0= No (skip to Q7), 1= Yes, go to frequency 1= rarely (once or twice in past 30 days) 2= sometimes (three to ten times in past 30	
7 7.a	Was there ever no food at all in your household because there were not resources to get more? How often did this happen?	0= No (skip to Q8), 1= Yes, go to frequency 1= rarely (once or twice in past 30 days) 2= sometimes (three to ten times in past 30 days)	

8 8.a	Did you or any household member go to sleep at night hungry because there was not enough food? How often did this happen?	0= No (skip to Q9) 1= Yes, go to frequency 1= rarely (once or twice in past 30 days) 2= sometimes (three to ten times in past 30 days) 3= often (more than 10 times in the past 30	
9	Did you or any household member go a whole day without eating anything because there was not enough food?	0= No (finished), 1= Yes, go to frequency 1= rarely (once or twice in past 30 days) 2= sometimes (three to ten times in past 30 days)	

2. Do you encounter shortage of food shortage in your household in the year 2010/11? A)Yes B).No
3. If yes, for how many months did your household face shortage of food and which month? _____

4. What factors do you think have caused food shortage in the year 2010/11?
5. What type of coping mechanism you used when you don't have enough food or money to buy food in your family?

No	Coping mechanism	a)Yes	b)No
1	Changing cropping pattern		
2	Migrating to nearby town for wage labor		
3	Consuming less preferred foods		
4	Borrowing grains from relatives		
5	Borrowing grains or cash from money lenders		
6	Migrating to others rural areas for wage labor		
7	Selling off small animals		

8	Selling grass and firewood		
9	Rely on relief grains		
10	Sell off farm oxen		
11	Leasing out land		
12	Engaging in petty trade		

Checklist Questions for Focus Group Discussion

Date of interview_____

Sex_____

Age_____

Group_____

Education level_____

1. Does the government supply different facilitates for the implementation of SLM?
2. Which type of erosion dominant in your area?
3. What are key activities to protect erosion and increase soil fertility in your area?
4. How to understand benefit of a forestation for soil fertility?
5. How many months per year did the farmer face shortage of food and which month? Why?
6. What are situations to increase food security status?
7. What type of strategies farmers used to recover for incase of food shortage?
8. Do you think that erosion can cause food insecurity?

Checklist for key informant interview

1. What are you activities to implement the effective SLM practices by helping farmers to do -? (by erosion, making terracing, plating tree around farmland, using fertilizers, etc.)
2. What are your activities in your farmlands to implement SLM practices to increase agricultural productivity effectively?
3. Which parameters do you used to make fertile the land which is difficult to farm?
4. Please describe the water retention ability of farm land soil in this woreda

ANNEXES 2 (Amharic version)

<u>የዳሰሳ ጥናት መ ጠ ይ ቅ</u>

በአዲስአበባዩኒቨርስቲየምግብዋስትናጥናቶችማእከል የሁለተኛ ድግሪ ተማሪነኝ። በአሁን ወቅት በአማራ ክልል ጣርማበር ወረዳ በቤትውስጥ የምግብ ዋስትና ኢንቨስትመንትንና ዘላቂየ መሬት ማኔጅመንት አስተዋፅ ላይ የመመረቅያ ጥናት እየሰራሁ እገኛለሁ። የዚህ መጠይቅ ዋና ዓላማ በጥናቱ አካባቢ ዘላቂ የምግብ ዋስትና ትግበራና ተያያዥ አሰራሮች በቤተሰብ የምግብ ዋስትና ላይ ያበረከቱትን አስተዋፅ ለመረዳት እንድችል ዋና የመረጃ አሰባሰብ የቤት-ማህበራዊ ኢኮኖሚያዊ እና የተቋማት ባህሪዎች እና ሌሎች ተዛማጅ መረጃዎች ዙሪያ መረጃ መሰብሰብ ነው።

ለጥያቄዎች የሚሰጡኝ ምላሽ ዋጋ ያለውና ለዚህ የጥናት ትንታኔ ብቻ የሚውል ነው። በዚህ ጥናት ውስጥ እኔ እና እርሶ ለጥቂት ደቂቃዎች ብቻ አጭር ውይይት እናደርጋለን።በማንኛውም ሁኔታ በስም አይለይም።

ስለትብብርዎ ከልብ አመሰግናለሁ!!

ኮድቁጥር:_____መጠይቁን የሞሉ ግለሰብ አድራሻ:- _____ **ቀበሌ**: _____ **ቀን:-** _____

ክፍል 1-ማህበራዊ-ኢኮኖሚያዊእናስነ-ሕዝባዊባህሪዎች

ቁጥር	ጥያቄዎች		ኮድ
19.	የቤተሰቡ አስተደዳሪ ፆታ:1. ወንድ 2. ሴት		
20.	የቤተሰቡ አስተዳዳሪ ዕድሜ		
20.1.	የቤተሰብ ኃላፊ የትምህርት ሁኔታ 1. ማንበብ እና መጻፍ 2. የሃይማኖት ትምህርት ቤት 3. መሰረታዊ / የጎልማሶች ትምህርት 4. የመጀመሪያ ደረጃ ትምህርት ቤት (1-4) 5. ሁለተኛ ደረጃ ትምህርት ቤት (5-8) 7. ሁለተኛ ደረጃ ትምህርት ቤት (9-10) 8. ዝግጅት (11-12) 9. ሌላ ካለ ይግለጹ		
21.	**የቤተሰብ መጠን**		
21.1.	በቤተሰብውስጥየቤተሰብአባላትብዛት	4. ወንድ	
		5. ሴት	
		6. ድምር	
22.	የጉልበት ሰራተኛይገኛል		
22.1.	በዳሰሳ ጥናት ወቅት ለእርሻ ሥራዎች ቋሚ የቤተሰብ ሥራ ብዛት	4. ወንድ	
		5. ሴት	
		6. ድምር	

5. ለግብርና የሚሆን መሬት ያ ገኛሉ? 1, **አዎ** 2, **የለም**

6. ለጥያቄ ቁጥር 5 '**አዎ**' ከሆነ በአሁኑ ጊዜ የሚጠቀሙት የእርሻ መሬት አጠቃላይ ስፋት ምን ያህል ነው? _____

7. በ2010/11 ያመረተት እና ያጭዱት ሰብሎች ዓይነት ይነገሩን?) እንዲሁም በኩንታል ወይም በኪ.ግ. የሸጡትን አጠቃላይ የሰብል ምርቶች መጠን ይንገሩን?

9. የእርሻ በሬዎች አለዎት? **1. አዎ2. የለም**

10. ለጥያቄ ቁጥር 9 '**አዎ**' ከሆነ በቁጥር ስንትበ ሬዎች ይኖሩዎታል? _____

11. ሌሎች የእንስሳት ከብቶች አሎት? **1. አዎ 2. የለም**

12. ለጥያ ቄቁጥር 11 '**አዎ**' ከሆነ ቁጥራቸውን ይነግሩናል?

13. ለከብቶችዎ የምግብ ዋና ምንጮች ምንድናቸው?

ቁጥር	**የምግብ ምንጭ**	**2. አዎ 2. አይ**
6.	የጋራ የግጦሽ መሬቶች	
7.	የግጦሽ የግጦሽ ምንጮች	
8.	ገለባ	
9.	የሰብሎች ቀሪዎች	
10.	ሌላ፣ ይግለጹ	

14. የአካባቢ ጥበቃ ተግባራትን ለመገንባት የሚያገለግሉ የእርሻ መሣሪያዎች አለዎት? 1.**አዎ** 2. **የለም**

15. ለጥያቄ ቁጥር 12 '**አዎ**' ከሆነ ቁጥራቸውን ይነገሩን?

ቁጥር	**የእርሻ መሳሪያዎች**	**1. አዎ 2. አይ**	**ቁጥር**
1.	አካፋ		
2.	ጠፍጣፋ መኮትኮቻ		
3.	መዶሻ		
4.	የውሃ ደረጃ / መስመርደረጃ / ክፈፍ		
5.	ሌላ፣ይግለጹ		

16. እርስዎ ወይም ሌላ የቤተሰብዎ አባል ከእርሻ -ውጭ እንቅስቃሴዎች ተሰማርተዋል? 1. **አዎ** 2. **የለም**

17. ለጥያቄቁጥር 16 '**አዎ**' ከሆነ፣ ስለተሳተፉት የእንቅስቃሴ ዓይነቶች እና ብዛት ይንገሩን?

ቁጥር	ከእርሻ-ውጭ እንቅስቃሴዎች ዓይነት	2. አዎ 2. አይ	የተሰማሩ የሰዎች ብዛት	ግምታዊ ገቢ ተገኝቷል
6.	የቤት እንስሳት ንግድ			
7.	ሽመና			
8.	የደመወዝ ሠራተኞች			
9.	የእጅ ሥራዎች			
10.	ሌላ ካላ ይግለጹ			

ክፍል II የቤትውስጥተቋማዊባህሪዎች

1. የኤክስቴንሽን አገልግሎቶችን ማግኘት ይችላሉ? 1. **አዎ** 2. **የለም**

2. የእርስዎ ምላሽ ለጥያቄ ቁጥር 1 ‹**አዎ**› ከሆነ፣ ምን አይነት አገልግሎቶች አግኝተዋል? 1. የተሻሻለ የሰብል ምርት 2. የተሻሻለ የከብት እርባታ 3. የተሻሻለየ ግብዓት አቅርቦት እና አጠቃቀም 4. ሌላ ካለ ይግለጹ

3. የሰብል ምርት፣የከብትእርባታእናየአፈርአስተዳደርላይየልማትወኪሎችንእና / ወይም ሌሎች የግብርና ባለሙያዎችን አነጋግረዋል? (ይገዛ አግኝተዋል) 1. **አዎ**2. **የለም**

4. ለጥያቄ ቁጥር 3 '**አዎ**' ከሆነ።በዓመት ስንት ጊዜ ያገኟቸዋል? 1. በየሳምንቱ 2. በየወሩ ሁለት ጊዜ 3. በየሦስት ወሩ 4. በዓመት ሁለት ጊዜ 5. በዓመት አንድ ጊዜ 6. ሌላ ካላ ይግለጹ

5. በእርሻ መሬትዎ ላይ የኤክስ.ኤም. አሰራሮችን በሚተገበሩበት ጊዜ ከኤክስቴንሽን ሰራተኞች የቴክኒክ ምክር አግኝተዋልን? 1. **አዎ** 2.**የለም**

6. በኤስኤል ኤምአሰራሮችላይ በአርሶ አደር ስልጠና ላይ ገብተው ያውቃሉ? ሀ) አዎለ) .የለም

7. ለጥያ ቄቁጥር 6 መልስዎ አዎ ከሆነ ሥልጠናው ለእርስዎ ተግባራዊ ኤስ ኤል ኤም ሥራ የሚረዳ ይመስልዎታል? **ሀ) አዎለ) የለም**

8. የብድር አገልግሎቶች አለዎት? **1. አዎ 2. የለም**

9. የብድር ምንጭዎት ምንድን ናቸው? **1. መደበኛ የብድር እና የቁጠባ ተቋማት 2. የአከባቢ ገንዘ ብአበዳሪዎች 3. ሌላካለ ይግለጹ**

10. ለኤስኤል ኤም ልምዶች ዱቤ ተጠቅመዋል? **1. አዎ 2. የለም**

11. አዎ ከሆነ ለጥያቄ ቁጥር 10 መልስ ከሆነ ለምንድነውለ ምንድነው ዱቤየ ተጠቀሙት (ብዙ ምላሽን መስጠትይቻላል) **ሀ. ማዳበሪያን ለመግዛት ለ. ዘርለመግዛትሐከብቶች ለመግዛት / ከእርሻውጭያልሆነንግድ G. ሌላ፣ይግለጹ**

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12. ምርትዎን ለመሸጥበ አከባቢዎ ውስጥ ወደ አከባቢው ገበያ መዳረሻ አለዎት? **1. አዎ 2. የለም**

13. ከቤትዎ (የአከባቢው ገበያ) ርቀትዎ ምንያ ህል ነው (በሰዓት መራመድ)?)

ክፍልIIIየ ቤቶች ጭንቅላት የአፈር መሸርሸር፣ የአፈርለ ምነት እና ዘላቂ የመሬት አያያዝ ልምዶች

1. በእርሻ መሬትዎ ላይ የአፈር መሸርሸር ችግር አለ ብለው ያስባሉ? **1. አዎ 2. የለም**

2.ለጥያ ቄቁጥር **1**መልስዎ አዎ ከሆነ ‘‘በአፈር መሸርሸር በአካባቢዎ የምግብ ዋስትና አለመኖር ምክንያት ነው ብለው ያምናሉን?’’ **1. አዎ 2. የለም**

3. ለጥያቄ ቁጥር 2.መልስዎ ‘‘**አዎን**’’

ከሆነ፣ ስለ የአፈር መሸርሸር ችግሮች በተመለከተ ምን እንደተገነዘቡ ያመልክቱ?_____

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4. የአፈር መሸርሸር ችግሮች ውጤት ምን ይመስልዎታል? (ብዙምላሽመስጠትይቻላል)

ቁጥር	**የአፈር መሸርሸር ችግሮች**	**1. አዎ 2. የለም**
12.	የአፈሩ ጥልቀት መቀነስ	
13.	የአፈር ለምነት ደረጃ መቀንስ	
14.	ለእርሻ አስቸጋሪነት (ክራንች)	
15.	በሚበቅሉ የሰብሎች ዓይነቶች ለውጥ	
16.	የግብርና ምርት መቀነስ	
17.	የእርሻ መሬት ንማጣት	
18.	በላይኛው አፈር ላይ ከፍተኛ የድንጋይ ክምችት	
19.	የከብት መኖ መቀነስ	
20.	በከብት ምርታማነት ማጣት	
21.	ያልተመጣጠነ ማዳበሪያ ፍላጎት ማሳደግ	
22.	ሌላ፣ ይግለጹ	

5. በዚህ አካባቢ የአፈር መሸርሸር አዝጋሚነትን እንዴት ይገመግማሉ? **ሀ) ጭማሪ ለ) መካከለኛ ሐ) ቅነሳ**

6. የአፈር መሸርሸር ሊቆጣጠር ይችላል ብለውያ ምናሉን? **ሀ) አዎ ለ) የለም**

7. የእርሻዎን መሬትከአፈርመሸርሸርበመከላከል / በማስተዳደርረገድተሞክሮአለዎት? **ሀ / አዎለ/የለም**

8. ለጥያቄ ቁጥር 7 '**አዎ**' ከሆነ፣ ከሚከተሉት የኤስ ኤል ኤም እርምጃዎች መካከል የእርሻዎን መሬት ከእድፋት ለመጠበቅ / ለማስተዳደር ልምምድ ያደርጋሉ?

ቁጥር	**እርምጃዎች**	**1. አዎ 2. የለም**
1	የድንጋይ ንጣፎች	
2	የአፈር ክፍያዎች ማረፊያ	
3	እርከን	
4	በየዓመቱ የሰብል ዓይነት ይተላለፋል	
5	ባህላዊ የመለዋወጫ ቀዳዳዎች	
6	የተቆራረጡ ፍሳሾች	
7	የውሃ መንገዶች	
8	የአትክልት ሽፋን	
9	ቆንጥሮ ማረስ	
10	ሌላ ካላ ይግለጹ	

9.በእርሻ መሬትዎ ላይ የአፈር ለምነት እጥረት እንዳለያስተውላሉ? 1. አዎ 2. የለም

10.ለጥያቄ ቁጥር9'አዎ' ከሆነ፣ በእርሻ መሬትዎ ላይ የአፈር መጥፋት መንስኤዎች ምን ይመስልዎታል? (ሰፋ ምላሽ መስጠት ይቻላል)

ቁጥር	የአፈር መጥፋት መንስኤዎች	1. አዎ 2. የለም
1.	ቀጣይነት ያለው ምርት / መፍረስ አልተሳካም	
2.	የተዘለለ ሰድልን በማዳበር ላይ	
3.	ከአቅም በላይ ግጦሽ	
4.	ደካማ የእርሻ ልምዶች	
5.	የደን ጭፍጨፋ	
6.	የአፈር የምሸረሸር ዝናብ	
7.	ሌላ ካላ ይግለጹ	

11. የእርሻ መሬትዎን የአፈር ለምነት የመጠበቅ እና እንደገና የመተካት ተሞክሮ አለዎት? **1. አዎ 2. የለም**

12. ለጥያቄ ቁጥር 11 መልስዎ **አዎ** ከሆነ ከሚከተሉት መለኪያዎች ውስጥ የትኛውን ይተገብራሉ?

13. እርስዎ እና የቤተሰብዎ አባል በቀበሌዎ በተከናወኑ የኤስ ኤል ኤም ልምዶች ውስጥ ይሳተፋሉ? ሀ) **አዎ** ለ) **የለም**

14.ለጥያቄ ቁጥር 13 'አዎ' ከሆነ፣ እንዴት ተሳትፈዋል? **ሀ) በፈቃደኝነት ለ) ያለወለድ / የግዴታ ሐ) ማበረታቻ (በጥሬገንዘብወይምለሥራ)**

15. በእርሻ ማሳዎችዎ ላይ የተተገበሩ የኤስ ኤል ኤም ልምዶችን ቀጠሉ? **ሀ) አዎ ለ) የለም**

16.የኤስ ኤል ኤም ልምምዶች ከተተገበሩ በኋላ በእርሻ መሬትዎ ላይ የአፈር መሸርሸር ችግሮች አዝማሚያ እንዴት ይለካሉ? **1. ቀንሷል 2. ጨምሯል 3. ምንምለውጥ የለም**

17. የኤስ ኤል ኤም አሰራሮችን መጠቀም ከጀመሩ በኋላ የእርሻ መሬትዎን ምርታማነት እንዴት ይለካሉ?

1. መጨመር 2. መቀነስ 3. ለውጥየለም

18. የኤስ ኤል ኤም አሰራሮችን መተግበር ከጀመሩ በኋላ የሰብል ምርታማነት ጨምሯል?

1. አዎ 2. የለም

19.ለጥያቄ ቁጥር18 መልስዎ **አዎ** ከሆነ፣ ምን ዓይነት የሰብል አይነት፣ ለእያንዳንዱ ሰብል የሚተገበሩ ግብዓቶች መጠን፣ እና የኤስ ኤል ኤም አሰራሮችን ከመተግበሩ በፊት እና በኋላ ምን ያገኙ እንደሆነ ይንገሩን?

20. የኤስ ኤል ኤም ትግብራ ለረዥምጊዜ የምግብ ዋስትናን ያረጋግጣል ብለው ያስባሉ?**1/አዎ 2. የለም**

21.ለጥያቄቁጥር20 "**አዎ**"ከሆነ የኤስ ኤል ኤም ልምምዶች የምግብ ዋስትናን ማረጋገጥ እንዴት ይችላሉ?_____

_____

22. በአከባቢዎ የኤስ ኤል ኤም አሰራሮችን ለመተግበር ዋና ዋና ችግሮች ምንድን ናቸው (ተማሪ መልሶች ሊኖሩ ይችላሉ)

ሀ. የቴክኖሎጂዎች ግባሀትን ማግኘት አስቸጋሪ ነው

ለ.ጥቅል ለመገንባት በጣም ብዙ ጉልበት ሠራተኛ ይጠቃል

ሐ.የእርሻ መሬትን ይቀንሳል/ ለማረስ አስቸጋሪ

መ. ደካማ የግብርና ኤክስቴንሽን አገልግሎት

ሠ.የሰብል ላይ የአፈር መሸርሸር ተፅእኖ አለመረዳት

ረ. ሌሎች ካሉ ይግለጹ

ክፍል IV የቤት ውስጥ የምግብ ደህንነት ምዘና እና የመቋቋም ዘዴ

1. በ 2010/11 በቤተሰብዎ ውስጥየ ምግብ እጥረት አጋጥሞዎታል? **ሀ) አዎ ለ) .የለም**

2. መልስዎ አዎ ከሆነ ቤተሰብዎ ስንት ወራት የምግብ እጥረት እንዳጋጠመና በየትኛው ወር ውስጥነ በር?

_____

3. እ.ኤ.አ. በ 2010/11 የምግብ እጥረትን ያስከተለ ምን ይመስልዎታል?

4. በቤተሰብዎ ውስጥ በቂ ምግብ ወይም ምግብ ለመግዛት ገንዘብ ከሌልዎት ምን ዓይነት መሣሪያ የመቋቋምያ ዘዴ ይጠቀሙ ነበር?

ቁጥር	**የመሣሪያው ዓይነት**	**ሀ)አዎ**	**ለ)የለም**
1	መከርከሚያ		
2	ለሰራተኛ የጉልበትሥራአቅራቢያ ወደሚገኝ ከተማ መሰደድ		
3	አነስተኛ ተመራጭ ምግቦችን መመገብ		
4	ከዘመዶች በመበደር		
5	እህል ወይም ገንዘብ ከገንዘብ አበዳሪዎችን መበደር		
6	ወደሌሎች የገጠር አካባቢዎች ለሰራተኛ የጉልበት ሥራ መሰደድ		
7	ትናን ሽእንስሳትን መሸጥ		
8	ሳር እና የማገዶ እንጨት መሸጥ		
9	የእፎይታ እህልን በመጠቀም		
10	የእርሻ በሬዎችን በመሸጥ		
11	መሬት በማከራየት		
12	በጥቃቅን ንግድ ውስጥ በመሳተፍ		

የቡድን ውይይት የማረጋገጫ ዝርዝር

ቃለ መጠይቅ የተደረገበት ቀን_____

ዞታ _____

ዕድሜ _____

ቡድን _____

የትምህርት ደረጃ_____

1.መንግስት የኤስኤል ኤምት ግበራን ለማስጀመር ምን ምን ነገሮችን አመቻችቷል ?

ቁጥር	የድጋፍ አይነት	አዎ	የለም	አዎ ብለው ከመለሱ ምክንያት	የለም ካሉ ምክንያት
1	ማዳበሪያዎችን መደገፍ				
2	ዘርን ለመትከል ወይም ችግኝ ተከል መስጠት				
3	እርከን ለመሥራት የሚያግዙ ቁሳቁሶች				
4	ዶማ				
5	አካፋ				
6	ሊለካል የገለጻል				

2. በተደጋጋሚ አከባቢዎ ውስጥ የትኛው የአፈር መሸርሸር አይነት ነው የሚከሰተው ?

ቁጥር	የአፈር መሸርሸር አይነት	አዎ	የለም	ምክንያት
1	ዝርግ			
2	ቦይ			
3	ወሃ ይዞ የሚረጭ			

3. የአፈር መሸርሸርን ለመከላከል እና የአፈር ለምነትን ለማሳደግ እንቅስቃሴዎ ምንድነው?

ቁጥር	የመከላከያ ዘዴዎች	አዎ	የለም	ምክንያት
1	ቀጥ ያሉ እርሻዎች			
2	ደን ማልበስ			
3	እርከን			
4	ባህላዊ ማዳበሪያ መጠቀም/ፍግ			
5	ሰው ሰራሽ ማዳበሪያ			

4. ለአፈር ለምነት ለምለም እርባታ ጠቀሜ ታእንዴት ይረደሉ?

5. ገበሬው በዓመት ስንት ወራት የምግብ እጥረት ያጋጠመል? በየትኛው ወር ? ለምን?

6. የምግብ ዋስትና ለመጨመር ምን ሁኔታዎች አሉ?

መስፈርቶች	**አዎ እና ምክንያት**	**የለም እና ምክንያት**
መጥፎ የእርሻ ልምምድ		
የእርሻ መሬት እጥረት		
ለእርሻ መሬት የሚያገለግሉ ማዳበሪያዎች እጥረት		
መሬትን በአግባቡ የመጠቀም ዕውቀት እጥረት		
ባህላዊ የአተካከል ልማድን አለመጠቀም		
የአፈር ዓይነት		

8. ገበሬዎች ከምግብ እጥረት ሲከሰትባቸው ለማገገም ምን ዓይነት ዘዴዎችን ይጠቀማሉ?

9. የአፈር መሸርሸር የምግብ እጥረት ሊያስከትል ይችላል ብለው ያስባሉ?

ቁልፍ መረጃ ሰጪ ቃለ-መጠይቅ ለማግኘት ዝርዝርን ይመልከቱ

ቁጥር	**ዖታ**	**ዕድሜ**	**የጋብቻ ሁኔታ**	**የቤተሰብ መጠን**	**የትምህርት ደረጃ**	**የቅጥር ሁኔታ**	**ሌላ ለማስታወሻ**
1							
2							
3							
4							
5							

1. አርሶ አደሮችን በመርዳት ውጤታማ የ ኤስ ኤል ኤም አሰራሮችን ለመተግበር ምን አይነት እንቅስቃሴዎች መደረግ አለባቸው

ቁጥር	**መስፈርቶች**	**አዎ**	**አይሆንምእና (አዎ ወይም አይደለም ለምን ይላሉ ለምን ጻፉ)**
1	የአፈር መሸርሸር ቁጥጥር		
2	እርከን መስራት		
3	በእርሻ መሬት ዙሪያ ዛፍ መትከል		
4	ማዳበሪያዎችን በመጠቀም		
5	አራርቆ መዝራት		
6	አጠቃላይ የኤስ ኤል ኤም ትግበራ ልምምዶችን በማሻሻል		
7	ከላይየ ተጠቀሱትን ሁሉ በመተግበር		

3. ለጥያቄ ቁጥር 1 **አዎ** ወይም አይደለም ብለው ከመለሱ ምክንያቱን ይጻፉ?

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4. ለጥያቄዎ መልስዎ **አዎ** ከሆነ አይደለም ወይም የለም ከሆነ። 2 ፃፍ

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4. ለጥያ ቁቁጥር **3** መልስዎ አዎ የለም ወይም መልስዎ አዎ የሚል ከሆነ ምክንያቱን ይፃፉ

5. ጥያቄ ቁጥርን **4**ን ካላደረጉ ወይም ካልሰሩ እና ምክንያትዎንፃፍ

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6. **አዎ** ከሆነ የመደምደሚያ ሃሳቦን ይፃፉ

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1. የእርሻ ምርታማነትን ውጤታማ በሆነ ሁኔታለማሳደግ የ ‹SLM› ትግበራዎችን ለመተግበር እርስዎ በሚሰሩት ውስጥ ምን እንቅስቃሴ አለዎት?

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ቁጥር	**እንቅስቃሴዎች**	**አዎ**	**የለም**	**ምክንያት**
1	ለአርሶ አደሩ ምርጥ ዘሮችን መስጠት			
2	ለአርሶ አደሮች ስልጠና መስጠት			
3	ማዳበሪያዎችን ማቅረብ			
4	የአፈር ዓይነትን መሞከሩ እናማዳበሪያውንይለካሉ			
5	የአፈርን ለምነት ለመጨመር ብዝሃ-ህይወትን መጠበቅ			
6	በወረዳው ውስጥ መስኖ ይገኛል			

8. አብዛኛው የመሬትዎ መረጋጋት እና ጽኑነት ነው::

ቁጥር	**የአፈር ሁኔታዎች**	**አዎ**	**የለም**	**እነዚህን ችግሮች ለመፍታት የሚወስዱት እርምጃ**
1	ለእርሻ አስቸጋሪ ነው			
2	በነፋስ ለማልማት እና ለማጥፋት ቀላል ነው			
3	ለማዳበር መካከለኛ			

9. ለእርሻ አስቸጋሪ የሆነውን መሬት ለምለም ለማድረግ የትኞቹን መለኪያዎችን ይጠቀማሉ?

ቁጥር	እንቅስቃሴዎች	አዎ	የለም	ምክንያት
1	ዛፎችን መትከል			
2	ለተክሎች ሽፋን መስጠት			
3	የበሰበሱ ቅጠላቅ ጠሎች መነስነስ			

10. የዚህ ወረዳ የእርሻ መሬት የውሃ ማቆየትአቅም እንዴት ያዩታል?

ቅጥር	ጥራት	የአፈር አይነት ጥቀሱ
1	ከፍተኛ	
2	መካከለኛ	
3	ዝቅተኛ	

Household Food Insecurity Access Scale (HFIAS) Measurement Tool

የምግብ ዋስትናቸውን ያላረጋገጡ ቤተሰቦች መለኪያ

ተ.ቁ	ጥያቄ	የመልስ አማራጭ/	መልስ
1.	ባለፉት አራት ሳምንታት ቤት ውስጥ በቂ ምግብ አይኖረኝም ይሆናል ብለው ሰግተው ያውቃሉ?	0 = አልሰጋሁም (ወደ ጥያቄ 9) 1= አዎ	_____
1.1.	ባለፉት አራት ሳምንታት ውስጥ ይሄ ስጋት ስንት ጊዜ ደርሶብዎታል?	1= አልፎ አልፎ (አንድ ወይም ሁለት ጊዜ) 2=አንዳንድ ጊዜ(3-10ጊዜ) 3=ሁልጊዜ(ከ 10ጊዜ በላይ)	_____

2.	ባለፉት አራት ሳምንታት ቤት ውስጥ በቂ ምግብ ወይም ገንዘብ ባለመኖሩ ምክንያት ርስዎ ወይም ማንኛውም የቤተሰብ አባል የወደዱትን ምግብ ሳይበሉ ቀርተው ያውቀሉ?	0 = አይደለም (ወደ ጥያቄ 10) 1=አዎ	.--------
2.1.	ባለፉት አራት ሳምንታት ውስጥ ይህ ስንት ጊዜ አጋጥሞዎታል?	1, አልፎ አልፎ (አንድ ወይም ሁለት ጊዜ) 2 = አንዳንድ ጊዜ (3-10 ጊዜ) 3= ሁል ጊዜ (ከ 10 ጊዜ በላይ)	.|----------
3.	ባለፉት አራት ሳምንታት ቤት ውስጥ በቂ ምግብ ወይም ገንዘብ ባለመኖሩ ምክንያት ርስዎ ወይም ማንኛውም የቤተሰብ አባል የተወሰኑ የምግብ አይነቶች ብቻ በልታችኋል?	0 = አይደለም (ወደ ጥያቄ 11) 1 = አዎ	.|----------
3.1	ባለፉት አራት ሳምንታት ውስጥ ይህ ስንት ጊዜ አጋጥሞዎታል?	1 አልፎ አልፎ (አንድ ወይም ሁለትጊዜ) 2=/አንዳንድ ጊዜ(3-10ጊዜ) 3=ሁል ጊዜ(ከ10ጊዜ በላይ)	.----------
4.	ባለፉት አራት ሳምንታት ቤት ውስጥ በቂ ምግብ ወይም ገንዘብ ባለመኖሩ ምክንያት ርስዎ ወይም ማንኛውም የቤተሰብ አባል መብላት የማትፈልጉትን ምግብ በልታችኋል?	0=አይደለም (ወደ ጥያቄ 12) 1 = አዎ	.|----------
4.1.	ባለፉት አራት ሳምንታት ውስጥ ይህ ስንት ጊዜ አጋጥሞዎታል?	1 አልፎ አልፎ (አንድ ወይም ሁለትጊዜ) 2=/አንዳንድ ጊዜ(3-10ጊዜ) 3=ሁል ጊዜ(ከ10ጊዜ በላይ)	.----------

5.	ባለፉት አራት ሳምንታት ቤት ውስጥ በቂ ምግብ ወይም ገንዘብ ባለመኖሩ ምክንያት ርስዎ ወይም ማንኛውም የቤተሰብ አባል ሳትጠግቡ ለመነሳት ተገዳችኟል?	0 = አይደለም (ወደ ጥያቄ 13) 1 =አዎ	.----------

5.1.	ባለፉት አራት ሳምንታት ውስጥ ይህ ስንት ጊዜ አጋጥሞዎታል?	1, አልፎ አልፎ (አንድ ወይም ሁለት ጊዜ) 2=አንዳንድ ጊዜ(3-10 ጊዜ) 3=ሁል ጊዜ(ከ10 ጊዜ በላይ)	.----------
6.	ባለፉት አራት ሳምንታት ቤት ውስጥ በቂ ምግብ ወይም ገንዘብ ባለመኖሩ ምክንያት ርስዎ ወይም ማንኛውም የቤተሰብ አባል ቁርስ፤ምሳ ወይም እራት መብላት ሳትችሉ ቀርታችኟል?	0 = አይደለም (ወደ ጥያቄ 14) 1 = /አዎ	.---------- --
6.1.	ባለፉት አራት ሳምንታት ውስጥ ይህ ስንት ጊዜ አጋጥሞዎታል?	1, አልፎአ ልፎ (አንድ ወይም ሁለት ጊዜ) 2=አንዳንድ ጊዜ(3-10 ጊዜ) 3=ሁል ጊዜ(ከ10 ጊዜ በላይ)	.|---------
7.	ባለፉት አራት ሳምንታት ቤት ውስጥ በቂ ምግብ ወይም ገንዘብ ባለመኖሩ ምክንያት በቤተሰቡ ውስጥ የሚላስ የሚቀመስ ያልነበረበት ጊዜ ነበር?	0 =አይደለም (ወደ ጥያቄ 15) 1 = አዎ	.----------
7.1.	ባለፉት አራት ሳምንታት ውስጥ ይህ ስንት ጊዜ አጋጥሞዎታል?	1, አልፎ አልፎ (አንድ ወይም ሁለት ጊዜ) 2=አንዳንድ ጊዜ(3-10 ጊዜ)	.----------

		3=ሁል ጊዜ(ከ10 ጊዜ በላይ)	
8.	ባለፉት አራት ሳምንታት ቤት ውስጥ በቂ ምግብ ወይም ገንዘብ ባለመኖሩ ምክንያት ርስዎ ወይም ማንኛውም የቤተሰብ አባል እየራበው ወደ መኝታ የሄደበት ጊዜ ነበር?	0 = አይደለም (ወደ ጥያቄ 16) 1 = አዎ	.|----------
8.1.	ባለፉት አራት ሳምንታት ውስጥ ይህ ስንት ጊዜ አጋጥሞዎታል?	1, አልፎ አልፎ (አንድ ወይም ሁለት ጊዜ) 2=አንዳንድ ጊዜ(3-10 ጊዜ) 3=ሁል ጊዜ(ከ10 ጊዜ በላይ)	.----------
9.	ባለፉት አራት ሳምንታት ቤት ውስጥ በቂ ምግብ ወይም ገንዘብ ባለመኖሩ ምክንያት ርስዎ ወይም ማንኛውም የቤተሰብ አባል ቀኑን ሙሉ ሳይበላ ውሎ ሳይበላ ያደረበት ጊዜ አለ?	0 = የለም 1 = አዎ	.---------- -
9.1.	ባለፉት አራት ሳምንታት ውስጥ ይህ ስንት ጊዜ አጋጥሞዎታል?	1, አልፎ አልፎ (አንድ ወይም ሁለት ጊዜ) 2 = አንዳንድ ጊዜ (3-10 ጊዜ) 3= ሁል ጊዜ (ከ 10 ጊዜ በላይ)	.---------- -