LIVELIHOOD DIVERSIFICATION STRATEGIES BY FARM HOUSEHOLDS IN SOUTHERN ETHIOPIA

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LIVELIHOOD DIVERSIFICATION STRATEGIES BY FARM HOUSEHOLDS IN SOUTHERN ETHIOPIA

Monograph

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The Livelihood Diversification Strategies are one of the sources of income-generating activities in Rural Development. The farmers should not solely depend on agriculture but must be encouraged to engage in Off-farm and Non-farm activities, which are allied agricultural activities. The thorough research was conducted in Boloso Sore District in Southern Ethiopia. The major objectives of this study were to identify the existing livelihood strategies adopted by rural households and assess factors that determine households' decision to choose alternative livelihood strategies. For this study, primary data were collected from randomly selected 149 households. Due to severe land scarcity, high population pressure, and recurrent drought, farm households in the study area widely engage in and pursue diverse, productive economic activities as livelihood strategies. The carrying capacity of agriculture to attain food and livelihood security is extremely declining from time to time. Diversifying livelihood strategies at the current time has become a common phenomenon in the study area. Descriptive statistics were applied to characterize the sample households' socioeconomic, demographic and institutional factors. The multinomial logistic regression model was applied to identify the factors determining the choices of rural household livelihood strategies on 15 explanatory variables. The rural households in the study area pursued different livelihood strategies such as on-farm alone, 63 (42.3%); on-farm + non-farm, 55 (36.9%); on-farm+ off-farm, 20 (13.4%); and on-farm+ non-farm + off-farm livelihood strategies, 11(7.4%). On-farm livelihood played a leading role by contributing 72% of the total income of the households, whereas Non-farm and Off-farm activities contributed 20% and 8% of the household incomes, respectively. A total of 15 explanatory variables were included in the empirical model, of which 11 were significant. These variables include age, livestock ownership, market proximity, training, total household income, credit use, dependency ratio, Landholding, number of oxen owned, Sex, and cooperative membership, which determines the significant choice of livelihood strategies. This study suggests that development interventions, policies, and supportive services should be designed to suit different groups of farmers' felt needs and circumstances.

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PREFACE

Introduction

Developing countries face many unemployment problems among youth and women in rural areas. On the other side, farmers become idle after the cultivation will support them only for six months per year. Most of them are not able to get proper job off-season in agriculture. Therefore, farmers, women and youth in rural areas must be involved with non-farm activities to increase their income throughout the year. The livelihood income diversification strategy is one of the engines of the growth of this sector to be developed to some extent. It is recommended that livelihood diversification strategies are solutions to engage them in different types of productive economic activities.

Livelihood Diversification is one of the survival strategies to come out of poverty in most developing countries. The vast majority of African countries continue to face widespread poverty. Most Ethiopian farmers who live in rural areas are engaged in rain-fed subsistence agriculture, and agriculture remains the primary means of livelihood. Rural people partake in several strategies, including agriculture intensification and livelihood diversification which enable them to attain food security; however, they are still unable to escape food insecurity. Another big challenge for Ethiopian farmers is climate change which hinders African farmers in general and Ethiopian farmers in particular. With farm size and productivity declining, low non-farm income and depleting assets, the capacity of the rural population have thus diminished to cope with droughts and production failures. Therefore, the farmers could not find suitable alternatives for survival in the given environment. So, Livelihood Diversification strategies are one of the options to curb the problematic situation in the villages.

Review of Pertinent Literature

The emergence of the livelihoods concept had all the qualities of a classic "paradigm shift," defined as a fundamental change in approach or underlying assumptions. This shift came when previous dominant theories and practices – particularly those associated with integrated rural development-lost their intellectual and political

attraction. Livelihood strategies combine activities people undertake to achieve their livelihood goals. Rural people use strategies to attain their goals, including agricultural intensification and livelihood diversification. There are three types of Livelihood Diversification activities, such as Agricultural Intensification: These strategies mainly continue or increase dependence on agriculture, either by intensifying resource use by applying more significant quantities of labour or capital for a given land area by bringing more land into cultivation or grazing.

Agricultural Extensification is a strategy where more acres of land, animals etc., are brought into the production process while other resources like labour, capital, or technology remain the same. It peruses to gain more livelihood from agriculture (crop production, livestock rearing, aquaculture, forestry, etc.).

Livelihood Diversification: Diversification here may broaden the range of on-farm activities (e.g. adding value to primary products by processing or semi-processing them) or diversify off-farm activities by taking up new jobs. It may be undertaken by choice for accumulation, investment purposes, or necessity to cope with temporary adversity or as a more permanent adaptation to other livelihood options' failure. The former motivation might be associated with a comprehensive income-earning portfolio to offset all future types of shocks or stress. In contrast, the latter would likely be a narrower, rehearsed response to a particular standard shock or stress type**.**

Methodology

The particular research study was conducted in Boloso Sore Woreda, which is highly densely populated and food insecure in the Wolaita Zone. The study area has three types of agro-climatic topographical nature of land distribution such as Dega (Highland), 60% 23%, Woynadega (Midland) and Kefil Kolla (Semi-lowland) 7%. The nature of rainfall is bimodal, with a mean annual rainfall of 1201-1600 mm. The short rainy season called ‘Belg’ starts from February to April and the long rainy season called ‘Meher’ starts from June to September. Agriculture is a significant livelihood, and farm households' primary income is on-farm and off-farm activities. Therefore, the basic unit of the study was rural farm households. A multi-stage sampling procedure was employed to select the sample households. In the 1st stage, the District/Woreda was

classified into two agro-ecological zones; Mid-highland and Lowland. In the 2nd stage, Three Villages/Kebeles were selected from 25 Mid Highland Kebeles. One Kebele was selected from 4 Lowland Kebeles using a simple random sampling method and was applied to select the Kebeles' households.

For the supplementary qualitative study, representatives of the community concerning the gender balance, Kebele leaders, Development Agents, Kebele residents, Community Based leaders, and religious leaders for participatory wealth ranking were invited for Focus Group Discussion. The three wealth categories (Better-off, Medium, and Poorest of the Poor) were established based on the shared criteria. The present study used descriptive statistics and econometric models to analyse households' collected data. The qualitative or categorical data types were analysed using percentages, chi-square test and frequency. On the other hand, the quantitative continuous data types were analyzed using one-way ANOVA, minimum, maximum, mean, and standard deviation. The interpretation and tabulation of data were made following the study's conceptual framework. After computing the descriptive statistics, Multinomial Logistic Regression was applied to identify the factors associated with the household's choice of livelihood strategies. The data analysis was conducted using Statistical Package for Social Sciences (SPSS) version 20.

Data Analysis and Results

The study's dependent variable was the choice of diversified livelihood strategies identified by the participants as Y_0 = On-farm alone, Y_1 = On-farm+Non-farm, Y_2 = On-farm+off-farm, Y_3 = On-farm+Non-farm+Off-farm . Household decision to choose livelihood strategies is the cumulative sum of different factors. This section explains the descriptive and inferential analysis of the household demographic, institutional and socio-economic factors linked to the choice of livelihood strategies pursued by rural households. The results indicate that among 15 hypothesized explanatory variables, only 11 were significantly influenced by the choice of On-farm + Non-farm, On-farm + Off-farm and On-farm + Non-farm + off-farm, respectively. The multinomial logit model result indicates that sex, land size, livestock ownership, annual cash income, age, cooperative membership, Oxen ownership, training, market distance, dependency ratio,

and credit use determine farmers' choice of livelihood strategies. The Focus Group Discussion interpreted the qualitative data results and Key Informants' Interviews with the Youth Group, Cooperatives, Micro-enterprise Development group, Government officials and community elders.

Conclusion and Recommendations

A multi-stage stratified sampling technique was used for selecting the sample households. Both descriptive and Multinomial Logit Regression (MLR) econometrics analyses were employed. Household livelihood asset variables for different livelihood strategy groups and the strategy across wealth status were better described in descriptive analysis. At the same time, a multinomial logit model was applied to investigate the determinants of diversified likelihood choice of livelihood strategies selected by rural household heads.

Conclusion

The principal livelihood activities available to rural households are on-farm alone, On-farm + Non-farm, On-farm + Off-farm, On-farm, Off-farm, and Non-farm. On-farm in the study area is the dominant economic activity and primary livelihood source for rural households. However, agricultural production has failed due to small land size, high population growth crops, and regular disease drought. As a result, it has forced people to look for employment alternatives other than agriculture.

Recommendations

Farmers Training Center (FTC) and equipping them with all training and demonstration materials should be significant agendas of the Government and relevant stakeholders' development intervention to improve the rural farmers' capacity. Building the capacity of rural households in the area of entrepreneurship, financial literacy, income-generating activities, rural business plan development, asset management, and other integrated areas of agricultural and non-agricultural pieces of training are essential dimensions that can improve the skills and knowledge of the rural poor to utilize the available opportunities efficiently.

High youth unemployment, limited economic and social alternatives, and increased youth migration to the cities looking for better jobs. Hence, Government and private investors have to intervene in the industrial and manufacturing sector to consume this massive unemployment

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FOREWORD

Dr.TEKLE LEZA, Associate Professor and
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Digital Technology

New technologies and recent advances have brought revolutionary changes in the conventional print-based industry of newspapers, magazines and books. More recently, electronic reader devices have flourished in the leisure-reading market. These devices can be used with read-only format electronic books. However, this shift has been a much slower process in the education market. With increasing demands for digital content, electronic textbooks are expected to play a significant role in changing the conventional book-reading practice of the students in the library. The students will use their cell phones to download all the necessary electronic documents to read themselves to become more familiar with E-books. The modern digital age has brought an e-publishing revolution. E-books are becoming shared, and technological innovations support this trend by allowing users to download, customize, print or send e-books instantly anywhere, anytime. The increasing numbers of students seeking electronic forms of information as a digital mode are familiar immediately. These students are the early adopters of the new digital technologies providing digital content in the new digital environment.

One of our academic staff, Dr.M.Senapathy from the Department of Rural Development and Agricultural Extension, College of Agriculture, Wolaita Sodo University, took the digital initiative steps to publish this E-book. It is designed for Graduate students and

research scholars on national and international levels pursuing research on Rural Development background or Sociology or Social work disciplines. Its main aim is to help research scholars looking for African countries' research studies. Those who have chosen the research topic of Rural Development mainly focus on methodological frameworks in their diverse and pluralistic nature and demonstrate their purpose, relevance and effectiveness.

Distinctive Advantages of E-Books

This E-Book has many distinctive features. This has made the task of Internet users easier to publish any kind of information. It is easy to create these electronic books on the internet. This format is accessible and portable on multiple platforms. Computer users can access these digital books on any system with a different configuration. The user can easily open and view the digital books on the computer system. It is also easy to store and carry digital books on portable devices like a pen drive, Digital Video Disc or iPod. It can have numbered pages, a table of contents, pictures and graphics, exactly like a printed book. E-books are virtual books used to display information on any subject on a digital medium. The significance of electronic books is that they can be used for several purposes.

First and foremost, Rural Development research titles has been compiled and contributed to world readers and users in general. This E-Book has five chapters: Introduction, Literature Review, Methodology, Results and Discussion and Summary, Conclusion and Recommendations, including Appendices. In this sense, the E-Book is concise and comprehensive and offers a complete research analysis of the particular research title of information in a relatively small space.

The E-book enlightens the knowledge of budding research scholars/Graduate students at the M.Sc. and Ph.D. level. It also covers many relevant literature reviews, detailed information about the study area and methodology, and statistical tools applied with final results with recommendations. Finally, the E-Book presents social research as a dynamic process leading from beginning to end, showing how researchers progress from one stage to the next, how decisions are made, how sampling methods are selected, and how conclusions and recommendations are drawn.

The E-Book offers Graduate students the need to know about social research: what it is, what it does, how it is used when it is used and for what purpose, what methods it employs, and a critical understanding of rural locality-based research. Such an intensive analysis may be accomplished through further reading to update the modern trends in research. As a result, Social work, psychology, anthropology, and other social sciences have been focused on in general.

Ideally, this E-book is prepared for beginners who wish to understand the Master Thesis and intend to conduct an elementary investigation. Nevertheless, an intelligent scholar may find this E-Book a good model for ordering, categorizing and integrating the embodiment of complete research knowledge in the social sciences.

At the outset, I appreciate the earnest endeavours of my colleague Dr.M.Senapathy who is always dynamic in generating new ideas that he wants to execute by publishing this E-Book. I hope this E-Books publication output will impart a new E-learning opportunity to our University students in Ethiopia.

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LIST OF ABBREVIATIONS

AE : Adult Equivalent

CARE : Cooperative for Assistance and Relief Everywhere

CSA : Central Statistical Agency

DA : Development Agent

DFID : Department For International Development of the United Kingdom

DPPC : Disaster Prevention and Preparedness Commission

EEA : Ethiopian Economic Association

FGDs : Focus Group Discussions

FTC : Farmers' Training Center

GDP : Gross Domestic Product

HHH : Household Head

IDS : Institute of Development Studies

IGA : Income Generating Activities

IMCI : Inverse of Market Concentration Index

Masl : Meter Above Sea level

MED : Micro Enterprise Development

MFI : Micro Financial Institution

NGOs : Non-Governmental Organizations

NMA : National Metrological Agency

KA : Keble Administration

PIPs : Policies, Institutions, and Processes

PPS : Probability Proportional to Population Size

LIST OF ABBREVIATIONS (CONT…)

PRA : Participatory Rural Appraisal

RICS : Rural Investment Climate Survey

RNFE : Rural Non-Farm Enterprise

SD : Standard Deviation

SL : Sustainable Livelihoods

SLA : Sustainable Livelihoods Approach

SLF : Sustainable Livelihoods Framework

SNNPR : Southern Nations and Nationalities Peoples Regional

SPSS : Statistical Package for Social Sciences

UNDP : United Nations Development Program

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ABSTRACT

The Livelihood Diversification Strategies are one of the sources of income-generating activities in Rural Development. The farmers should not solely depend on agriculture but must be encouraged to engage in Off-farm and Non-farm activities, which are allied agricultural activities. The thorough research was conducted in Boloso Sore District in Southern Ethiopia. The major objectives of this study were to identify the existing livelihood strategies adopted by rural households and assess factors that determine households' decision to choose alternative livelihood strategies. For this study, primary data were collected from randomly selected 149 households. Due to severe land scarcity, high population pressure, and recurrent drought, farm households in the study area widely engage in and pursue diverse, productive economic activities as livelihood strategies. The carrying capacity of agriculture to attain food and livelihood security is extremely declining from time to time. Diversifying livelihood strategies at the current time has become a common phenomenon in the study area. Descriptive statistics were applied to characterize the sample households' socioeconomic, demographic and institutional factors. The multinomial logistic regression model was applied to identify the factors determining the choices of rural household livelihood strategies on 15 explanatory variables. The rural households in the study area pursued different livelihood strategies such as on-farm alone, 63 (42.3%); on-farm + non-farm, 55 (36.9%); on-farm+ off-farm, 20 (13.4%); and on-farm+ non-farm + off-farm livelihood strategies, 11(7.4%). On-farm livelihood played a leading role by contributing 72% of the total income of the households, whereas Non-farm and Off-farm activities contributed 20% and 8% of the household incomes, respectively. A total of 15 explanatory variables were included in the empirical model, of which 11 were significant. These variables include age, livestock ownership, market proximity, training, total household income, credit use, dependency ratio, Landholding, number of oxen owned, Sex, and cooperative membership, which determines the significant choice of livelihood strategies. This study suggests that development interventions, policies, and supportive services should be designed to suit different groups of farmers' felt needs and circumstances.

Keywords: Choice of Livelihood Strategies, Rural Households, Multinomial Logit Model, On-Farm, Off-Farm and Non-Farm Activities

CHAPTER I

1. INTRODUCTION

1. INTRODUCTION

1.1 Background of the Study

A livelihood strategy is choosing activities and asset investments to maintain and improve livelihoods. Understanding this process requires measuring household assets, activities and outcomes and evaluating the context in which they form strategies. The problem of poverty has crippled the world economy from time to time. Poverty is visible in all corners of the world, through its severity varies. The vast majority of African countries continue to face widespread poverty. According to African Development Bank (ADB) 2007, close to 50% of the population of Sub-Saharan Africa earned less than one US Dollar a day. In developing countries, a move away from the agricultural sector to the industry is expected to improve income distribution by increasing low-income groups' income. In contrast, an increase in the relative productivity of agriculture is expected to reduce income disparities by increasing the income of those employed in this sector (Topalova, 2007). Although diversification via non-agricultural means provides 20-45% of full-time employment and 30-50 per cent of rural household income in Africa, policymakers have little attention (Babatunde and Qaim, 2010).

Most Ethiopians who live in rural areas are engaged in rain-fed subsistence agriculture, and agriculture remains the primary means of livelihood. About 95% of agriculture's total production comes from small-scale producers. Nevertheless, small-scale traditional production has come under pressure, questioning its capacity to cope with the problems of livelihood construction, food security, environmental protection and poverty reduction (Ayele, 2005). Household food security is primarily distressed by external factors, including rainfall patterns, land degradation, climate change, population density, low levels of rural investment and the global market (WFP, 2011). Rural people on their side partake in many strategies, including agricultural intensification and livelihood diversification, which enable them to attain food security goals; however, they are still unable to escape food insecurity.

Agricultural activities are at risk from rainfall aberrations, temperature fluctuations, hailstorms, cyclones and climate change. These risks are exacerbated by price fluctuation,

weak rural infrastructure, imperfect markets and lack of adequate financial services. These factors endanger the household's livelihood and income and undermine the viability of the agricultural sector (Sharma, 2010). However, this sector has long been recognized as a source of livelihood for poor African rural households and the engine for economic growth (Muchopa *et al*., 2004). Moreover, for rural households, on-farm and off-farm activities generate additional income in addition to the main agricultural activities.

The livelihood diversification strategy is not only driven by constraints or "the unrelenting struggle for survival of the poor", but incentives can also determine it. While some diversify because they have little choice, better-off households may diversify because they have many choices (Barret *et al*., 2005; Hart, 1994). Hence, diversification could be involuntary or voluntary. Motives for the choice of diversification strategy are different across households with different endowment stock and access to resources. In practice, difficult to isolate and different across communities with a different sets of natural endowments such as fertile arable land. Since a host of heterogeneous, interacting factors contribute to shaping household Livelihood diversification strategies, Barret et al. (2001) suggest using much-disaggregated analysis to understand better factors shaping livelihood strategies in specific communities. The poor rural struggle for food security in response to different push and pull factors. Click here (**https://www.youtube.com/watch?v=ROxDKZzuSOk**)

The most recent evidence indicates that about 57 per cent of the rural households in the Woilata Zone average, was less than 0.25 hectares of Landholding, which could not guarantee livelihood and the poor rural households even if it could not adequately support hand-to-mouth subsistence farming (WZFEDD, 2015). To cope with the existing challenges, the rural household in the study area engaged in various types of non-farm and off-farm activities in addition to agriculture

According to Yishak *et al.* (2014), the crisis of livelihood survival will be a more serious and challenging task for the future generation. Alternative means of livelihood substitution may be a possible way to solve this. Moreover, in the Zone, the rural population pressures increase the demand for food consumption during drought and famine. This situation has peaked and challenged many people due to seasonal climate variation and uncontrolled population growth. Livestock holdings are on the decline because of the shortage of

grazing areas and feed availability, drought and animal disease. With farm size and productivity declining, scarce non-farm income and depleting assets, the capacity of the rural population have thus diminished to cope with droughts and production failures.

The agricultural sector of Boloso Sore District (W*oreda)* is characterized by land scarcity, increasing fragmentation of already tiny farms, shortage of draught animals, and adequate grazing land. To this effect, the farming economy cannot feed and sustain the area's increasing population. This implies that the non-farm sector has to be developed to absorb more of the growing population. Thus, support for diversification away from precarious livelihood strategy (agriculture) towards sustainable alternatives whose returns are not correlated with land - possibly agro-industry, education, and ginger marketing help to shift some proportions of farmers from direct reliance on the land for their livelihoods and enhancing use of technologies (Adugna, 2008). This study, therefore, was conducted to assess the choices of diversified livelihood strategies in Boloso Sore Woreda.

1.2 Statement of the Problem

Livelihood strategies are at the centre of rural development. However, identifying the numerous factors that determine the rural households' choice of livelihood strategies in Ethiopia needs a systematic intervention approach to decrease the threat to the poor (Adugna, 2008). The agricultural sector cannot support a rapidly increasing rural population in its prevailing technology, labour productivity, and policy environment (Tesfaye, 2003, Abu, 2013). The primary dependence on subsistence crop production in Ethiopia and harvest failure led to household food deficits, which in the absence of off-farm and /or non-farm income opportunities and/or other means such as timely food assistance, lead to asset depletion and increasing levels of destitution at the household level (FDRE, 2002). The determining factors of poverty are diverse and complex and need close analysis at the grassroots or household level. Constraints in access to asset and asset endowment, lack of options for livelihood strategy activities and strategies, and institutional and organizational problems contribute to the poverty level of the rural poor life (Carswell, 2000).

Additionally, the fact that food insecurity in Ethiopia derives directly from dependence on undiversified livelihoods based on low-input, low-output rain-fed agriculture is forcing the

country to adopt diversification of the rural people's means of livelihoods that typically exist both within and between households and across the agro-ecology to achieve food security (Devereux, 2000). From the point of view of reducing poverty and food insecurity in rural Ethiopia, it is imperative to reduce the vulnerability of the poor through a diversification strategy and opportunities for the sources of their livelihoods. Click here **https://www.youtube.com/watch?v=VwOZmakOPfg**

The rural economy is not based solely on agriculture but rather on a diverse array of activities. So it is crucial to recognize that rural people have their own strategies to secure their livelihoods which vary from household to household depending on numerous factors such as their socio-economic status, education and local knowledge, and stage in the household life cycle. Moreover, even in the same locality, there can be a significant dissimilarity between the strategies of those with different socioeconomic backgrounds, for example, those with more land and those with less land or landless (Wagayehu, 2004).

All geographic locations do not have similar resource endowments, do not face a similar level of constraints and do not necessarily employ similar strategies to solve their problem (Barret *et al*., 2001; Warren, 2002). Even within similar geographic locations, socio-economic factors pose a wide range of differentials among rural households, including demographic characteristics of households, well-being or economic and social status, and the gender disparity perspective. The differences in endowments of resources, in turn, influence rural households' capability and survival strategy. Poor people, especially in rural areas, manage a complex range of assets and activities to sustain themselves. Development professionals and officials often fail to understand this sufficiently (Norton and Foster, 2001).

In the choice of the livelihoods strategy, rural households diversify their income sources from agriculture or outside agriculture to enhance their income from these activities. Widening income sources by engaging in diverse off-farm and non-farm activities are essential as farming fails to provide an adequate means of survival (Ellis, 2000).

The study area, Boloso Sore District (Woreda), is one of the Woredas of the Wolaita Zone, frequently vulnerable to drought. In the Woreda, farming is more vulnerable because of the decreasing rural landholding from time to time, increasing cultivation pressure on small areas, reduced land fertility, and declining crop yields and livestock ownership. The above problems were aggravated because of a decrease in the availability of grazing land and finding feeders for animals.

This study, therefore, was conducted to assess the levels and choices of rural household livelihood diversification strategy and the factors associated with it in Boloso Sore Woreda.

1.3 Objectives of the Study

1.3.1. General Objective

The general objective of this study was to assess the choice of rural household livelihood strategies and factors associated with it in the Boloso Sore District (Woreda) of the Wolaita Zone.

1.3.2. Specific Objectives

The Specific Objectives of the study were as follows:

1. To identify the choice of livelihood strategies pursued by rural households, and
2. To analyze the determinants of households' livelihood strategy choices

1.4. Research Questions

The study addresses the following research questions:

1. What livelihood strategies are pursued by different categories of rural households in the study area?
2. What determinants of rural households' livelihood strategy choices in Boloso Sore Woreda?

1.5 Significance of the Study

Development practitioners increasingly emphasise the importance of understanding livelihood strategy systems and the rural livelihood strategy for effective policy formulation. Consequently, livelihood strategies have become central to the development practice in recent years. The livelihoods strategy approach has the advantage of placing the poor at the Centre stage and exploring aspects of their commonly neglected livelihoods. These include the multidimensional nature of poverty itself, the diverse and dynamic nature of their 'portfolios', and the complexities of accessing capital assets. Therefore, such empirical research would have both basic and applied purposes.

Since literature concerning livelihood diversification strategies was conducted in the study area, the study's findings are expected to reach the existing literature gap on understanding the rural households' livelihood strategies and their determinants and the dynamics of poverty changes occurring in the study area. Regarding practical purposes, the planners may utilise the empirical findings to formulate new policies and policy reforms. Thus, local and international NGOs interested in promoting rural development in the study area benefit from the findings. Moreover, it provides baseline information for researchers who need to undertake similar research in the feature.

1.6. Scope and Limitations of the Study

Even if the choice of livelihood strategies is diverse across the agro-ecology and rural people, this study has emphasized only household-level situations. Similarly, livelihood strategies are also dynamic. The study was done using data collected from a cross-section of the households in the woreda and enabled the researcher to capture the inter-temporal variations in livelihood strategies in differing contextual settings. Therefore, this study may not be free from these limitations. However, to mitigate this problem as much as possible, attempts were made, i.e. oriented them about the study's objectives and that the information they provided would not be shared with the third party or they would not face any consequences for disclosing them.

1.7 Organization of the Thesis

This Thesis is organized into five chapters. First Chapter Introduction the second chapter deals with a literature review that includes livelihood approaches, the study's conceptual framework, and empirical studies on the determinants of livelihood strategies. The third chapter briefly describes the study area and the research methodology employed in sampling, data collection and analysis. Chapter Four deals with the statistically processed results with meaningful interpretation and discussions. Finally, Chapter Five presents summary and policy recommendations based on the research findings.

CHAPTER II

2. REVIEW OF PERTINENT LITERATURE

2. REVIEW OF PERTINENT LITERATURE

In this chapter, a review of relevant literature is conducted. The Chapter is further divided into sections that provide definitions, concepts and origins of livelihood and an overview of theoretical and empirical literature related to factors that affect rural household livelihood strategies.

2.1. Origin of the Concepts of Livelihoods

The emergence of the livelihoods concept had all the qualities of a classic "paradigm shift," defined as a fundamental change in approach or underlying assumptions. This shift came when previous dominant theories and practices – particularly those associated with integrated rural development-lost their intellectual and political attraction (Carney, 1998; Solesbury, 2003).

Different authors and organizations have defined livelihood, although the first definition was formulated by Chambers & Conway (1992). Borrowing concepts of this definition, the IDS team redefined livelihood to include the capabilities, assets (including material and social resources), and activities required for living. A livelihood is sustainable when coping with and recovering from stresses and shocks to maintain or enhance its capabilities and asset. According to Ellis (2000), a livelihood comprises the assets (natural, physical, human, financial and social capital), the activities, and the access to these (mediated by institutions and social relations) that together determine the living gained by the individual or household. Livelihood refers to how individuals or households ensure enough food on the table and provide the necessities for a good life (DEAT, 2009).

2.1.1 Sustainable Livelihood Framework

The Brundtland Commission first introduced the sustainable livelihoods idea on Environment and Development to link socio-economic and ecological considerations in a cohesive, policy-relevant structure. The 1992 United Nations Conference on Environment and Development expanded the concept and advocated for achieving sustainable

livelihood as a broad goal for poverty eradication (Lasse Krantz, 2001). A household's livelihood is secure when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and productive asset base (Chambers and Conway, 1992). Standing from the previous livelihood definition, livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future while not undermining the natural resource base (Carney, 1998). Click here (**https://www.youtube.com/watch?v=rgNN2i-Rf2M**). Ashley and Carney (1999) discuss the aims of the Sustainable Livelihoods Approach (SLA) as development and poverty reduction through promoting development that is sustainable not just ecologically but also institutionally, socially and economically and to produce genuinely positive livelihood outcomes (rather than concerning themselves with narrow project outcomes, with resources or with output). There is no unified approach to applying the Sustainable Livelihood concept. Depending on the agency, it can be used primarily as an analytical framework (or tool) for program planning and assessment or as a program. There are, however, three basic features common to most approaches. The first is that the focus is on the livelihoods of the poor. The second is that the approach rejects conventional approaches of entry points to a specific sector such as agriculture, water, or health. Eventually, the SLA approach emphasises involving people in identifying and implementing activities where appropriate. In this regard, different development agencies use the SL approach as a strategy for poverty alleviation. They also use similar definitions of what constitutes sustainable livelihoods. For instance, UNDP and CARE use it to facilitate the planning of concrete projects and programs, while for DFID, the SLA approach is more of a basic framework for analysis than a procedure for programming. It is also used to assess and review ongoing projects and programs to make them more sensitive and responsive to the conditions and needs of the poor (Lasse Krantz, 2001).

2.1.1.1. Vulnerability Context

Vulnerability refers to seasonality, trends, and shocks that affect people's livelihoods and directly impact people's asset status and the open options to pursue beneficial livelihood outcomes. The critical attribute of these factors is that they are not susceptible to control

by local people themselves (Chambers and Conway, 1992; DFID, 1999; Ellis and Allison, 2004). It is a concept that combines exposure to a threat with susceptibility or sensitivity to its adverse consequences, where people have no or little control over it. There is a mutually reinforcing relationship between vulnerability and food insecurity. Vulnerability is fundamentally about risk, uncertainty and lack of security. It is the susceptibility of individuals or households to specific risk events. Risk refers to the likelihood of shocks and stress that can be either external (weather-based events, market crises, etc.) or internal (sickness and death) to the household (DFID, 1999 Dercon, S and P. Krishnan, 2005).

2.1.1.2. Livelihood Assets

Livelihood Assets are the resources people draw to carry out their livelihood strategies (Farrington *et al.,* 2002). The household members combine their capabilities, skills and knowledge with the different resources at their disposal to create activities that will enable them to achieve the best possible livelihood choice. Everything that creates that livelihood can be considered a livelihood asset (Meser and Townsley, 2003). Synonymously, the term capital is used as livelihood assets. It refers to tangible or intangible assets held by a person or household for use or investment; wealth can produce more wealth in whatever form, any source of benefit or assistance. Various forms of capital can be accumulated, exchanged, expended and lost, affecting a household's livelihood security, quality of life, and options for coping strategies (CARE, 2001).

Natural Capital

Natural capital is used for the natural resource stocks from which resource flows and services (e.g. nutrient cycling, erosion protection) useful for livelihoods are derived. This produces nature's goods and services and comprises food (both farmed and harvested or caught from the wild), wood and fibre; water supply and regulation; treatment, assimilation and decomposition of wastes; nutrient cycling and fixation; soil formation; biological control of pests; climate regulation; wildlife habitats; storm protection and flood control; carbon sequestration; pollination; and recreation and leisure (DFID, 1999). Natural capital is significant to those who derive all or part of their livelihoods from resource-based activities. Within the sustainable livelihoods framework, the relationship between natural capital and the vulnerability context is particularly close (DFID, 1999). Many of the shocks (fire, flood,

earthquake, etc.) that devastate the livelihoods of the poor are natural processes that destroy natural capital (land, forest, etc.). Land size is one of the leading indicators for assessing household natural capital (Berhanu, 2007; Adugna, 2008;).

Social Capital

In the context of the sustainable livelihoods framework, it is taken to mean the social resources upon which people pursue their livelihood objectives. The social assets comprising social capital include norms, values and attitudes that predispose people to cooperate, networks and connections (patronage, neighbourhoods, kinship), relations of trust and mutual support, formal and informal groups, standard rules and sanctions, collective representation, mechanisms for participation in decision-making, leadership, reciprocity and obligations; and mutually-agreed or handed-down. Social capital yields a flow of mutually beneficial collective action, contributing to the cohesiveness of people in their societies (DFID, 1999). When we look at the relationship of social capital with other types of capital and its effect on livelihood outcomes, it improves economic relations efficiency. Social capital can help increase people's incomes and savings (financial capital). Social capital can also improve shared resources (natural capital) and the maintenance of shared infrastructure (physical capital) and facilitate innovation, knowledge, and sharing of that knowledge. Various proxies for social capital can be used, like membership in agricultural cooperatives, the incidence of mutual help in hard times, etc. (Bezemer and Lerman, 2002; Adugna, 2008).

Human Capital

The main characteristics of human capital are age, education, Sex, health status, household size, dependency ratio and leadership potential, etc. (Bezemer and Lerman, 2002; Farrington et al., 2002). It is enhanced by their access to services that provide these, such as schools, medical services, and adult training. People's productivity is increased by interacting with productive technologies and with other people (social capital). Human capital has a significant impact on the achievement of livelihood outcomes and other capital. For instance, Health status is directly related to income/food security (with relevant knowledge). Higher income is often reinvested in education, and reduced vulnerability can reduce the birth rate (knock-on effects on nutrition and labour). High levels of social capital can also substantially add to human capital since social networks

facilitate innovation, knowledge and sharing of that knowledge. Leadership and organizational skills are also necessary to make other resources more valuable. Therefore, there is a close relationship between different capital, particularly social and human capital. Human capital is a factor for the amount and quality of labour available; this varies according to household size, skill levels, leadership potential, health status, etc. (DFID,1999). Berhanu (2007) and Adugna (2008) were the authors who took different human capitals like Age, educational level, Sex, household size and dependency ratio as indicator variables for their investigation at the household level.

Physical Capital

Physical capital comprises the basic infrastructure and producer goods needed to support livelihoods. The infrastructure consists of changes to the physical environment that help people meet their basic needs and be more productive, such as roads, bridges, telecommunications, market infrastructure, transportation systems, etc.). Producer goods are manual and mechanized tools and equipment that people use to function more productively. Insufficient or inappropriate producer goods also constrain people's productive capacity (DFID, 1999). To analyze the relationships between household livelihood strategy choices and physical capital, input use, such as market distance, was used as an indicator variable (Adugna, 2008).

Financial Capital

Financial capital is the financial resources available to people and provides them with different livelihood options. It comprises the substantial cash or equivalent availability that enables people to adopt different livelihood strategies (Kollmair and Gamper, 2002). There are two primary sources of financial capital: available stock and regular inflow of money. Available stock can be held in several forms: cash, bank deposits or liquid assets such as livestock and jewellery. Financial resources can also be obtained through credit-providing institutions. The most common inflows are pensions, other transfers from the state, and remittances (DFID, 1999). Credit access and remittance are the indicators variables under the financial capital for investigation regarding the household level (Berhanu, 2007, Adugna, 2008, Fekadu B., and Mequanent M. (2010). Click here (**https://www.youtube.com/watch?v=ZozbmClcYx4**)

2.1.2.3 Policy and Institution

Policies are the general guidelines that govern resource use, whereas institutions are the social cement that links stakeholders to access capital of different kinds to exercise power (DFID, 1999). Policies and processes may influence both households' choices about using their assets and the types and amount of assets they can access. Policies usually decided upon at different levels of government will affect how households can take decisions or use the livelihood assets at their disposal. For example, policies for giving more responsibility to village-level institutions may give local people more influence over the decisions that affect them directly (FAO,2009). Generally, the institutions and policies of the transforming structures and processes profoundly influence the creation of access to assets, determination of access to assets and rates of household asset accumulation (DFID, 1999). Click here (**https://www.youtube.com/watch?v=3Oqfb4G3SWs**)

2.1.1.4. Livelihood Strategies

Livelihood strategies combine activities people undertake to achieve their livelihood goals. Rural people use strategies to attain their goals, including agricultural intensification and livelihood diversification. However, the contribution made by livelihood diversification to rural livelihoods has often been ignored by policymakers who have chosen to focus their activities on agriculture (Carswell, 2000). Ellis also defined Livelihood strategies as the activities realized by household members (On-farm, off-farm, and Non-farm activities), resulting in outcomes such as food or income security, and it includes coping strategies designed to respond to shocks in the short-term and adaptive strategies designed to improve circumstances in the long term. These strategies are determined by the assets and opportunities available and the choice and preferences of men and women. A single livelihood strategy could not apply at the village or community level since different households will adopt different strategies according to their particular asset and asset status (Ellis, 2000).

2.1.1.5. Livelihood Outcomes

Livelihood Outcomes are the achievements or outputs of livelihood strategies (DFID, 2002). These are the achievements of livelihood strategies, such as more income (e.g.

Cash), increased well-being (e.g. non-material goods, like self-esteem, health status, access to services, sense of inclusion), reduced vulnerability (e.g. better resilience through an increase in asset status), improved food security (e.g. increase in financial capital to buy food) and more sustainable use of natural resources (e.g. Appropriate property rights) (Scoones, 1998). However, it is not achieved for many of the poor, whose primary day-to-day objective remains to secure enough food to eat (DFID, 2000). Activities lead to outcomes, and outcomes might be immediately apparent or only evident over time. Outcomes result from activities or direct use of assets (Winters *et al*., 2002).

2.1.2. Types of Livelihood Strategies

Livelihood strategies have been classified according to different criteria. Scoones (1998) divide rural livelihood strategies into three broad types according to the nature of activities undertaken: agricultural intensification and intensification and livelihood diversification.

Agricultural Intensification/Extensification: These strategies mainly increase dependence on agriculture by intensifying resource use by applying more significant quantities of labour or capital for a given land area or by bringing more land into cultivation or grazing.

Agricultural Extensification is a strategy where more land, animals etc., are brought into the production process while other resources like labour, capital, or technology remain the same (Hussein and Nelson, 1999). It peruses to gain more livelihood from agriculture (crop production, livestock rearing, aquaculture, forestry, etc.).

Livelihood Diversification: Diversification here may broaden the range of on-farm activities (e.g. adding value to primary products by processing or semi-processing them) or diversify off-farm activities by taking up new jobs. It may be undertaken by choice for accumulation, investment purposes, or necessity to cope with temporary adversity or as a more permanent adaptation to other livelihood options' failure. The former motivation might be associated with a comprehensive income-earning portfolio to offset all future types of shocks or stress. In contrast, the latter would likely be a narrower, rehearsed response to a particular standard shock or stress type.

2.1.3. Livelihood Approaches to rural poverty

Rural poverty reduction approaches for the last three decades of the twentieth century were primarily premised on increasing small-farm agriculture productivity. In the late 1980s, reforms on the agricultural sector's structural adjustment had occurred and sought to rectify earlier inefficiencies associated with top-down approaches and state bureaucracies, emphasizing economic liberalization and privatization. Farming systems approaches, which attempted to develop a better Ellis (2000) in terms of pervasive public policy bias in favour of urban and industrial interests (Lipton, 1977), the capture of the benefits of subsidies and other supports by richer rather than more impoverished farmers, incompetence, corruption and waste by state agencies resulting in deteriorating institutional environment for small-farm growth, and price and exchange rate policies were resulting in artificially low returns to agricultural production (Lasse Krantz, 2001). Understanding the economic, social and institutional interactions at the farm level was introduced to complement existing top-down approaches that predominantly focused on technological solutions (Carney, 1999; Ellis, 2000).

Besides, de-coupling the concepts of rural and agricultural livelihood approaches Centre-stage the capabilities and resourcefulness of rural people, rather than focusing on the resources themselves (e.g. forests, fisheries, land) providers (e.g. extension services, research) previous approaches have done. The achievement of sustainable poverty reduction will, however, require that external mediating forces (i.e. policies, institutions and processes) falling within the remit of the state and civil society influence the work with people in a way that is congruent with their existing livelihood strategies and ability to adapt (Carney, 1999). To understand the complex and differentiated processes through which livelihoods are constructed, it is essential that SL analyses fully involve the local people to let their knowledge, perceptions, and interests be heard.

Several international development agencies are now applying such a livelihood approach in their practical development work. However, it is difficult to talk of one unified approach since each agency has adopted a somewhat different version, from seeing it primarily as an analytical framework (or tool) for program planning and assessment to a particular type of program. There are, however, three essential features that most approaches have

in common. The first is that the approach focuses on the livelihoods of the poor since poverty reduction is at its core. The second is that it rejects the usual sector entry point (e.g. agriculture, water, or health) and instead begins analysing people's current livelihood systems to identify an appropriate intervention. The final feature emphasises involving people in identifying and implementing appropriate activities (Lasse Krantz, 2001).

2.2. Empirical Studies on the Determinants of Livelihood Strategies

Livelihood strategy is more complicated and comprehensive by definition and concept, but many studies were carried out regarding household livelihood Strategies in different parts of the world. Some studies on livelihood diversification in different countries, including Ethiopia, have stated that numerous factors determine the abilities of rural households to choose among the available livelihood strategy options that are away from crop and livestock production economic activities. Ellis (2000) stated that there is found to be challenging and impossible for scholars and researchers to negotiate the most important driving force for household participation in off/non-farm activities.

Availability of critical assets (such as savings, land, labour, education and/or access to market or employment opportunities, access to common property, natural resources and other public goods) is an evident requisite in making rural households and individuals more or less capable of diversifying (Warren, 2002). However, diversification may also be a coping response to the loss of capital assets needed for conventional on-farm production. Decreased availability of arable land, increased producer/consumer ratio, credit delinquency, and environmental deterioration can be critical drives towards diversification.

Similarly, Meser and Townsley (2003) argued that different livelihood activities have different requirements. However, the general principle is that those amply endowed with assets are more likely to make positive livelihood choices. They will choose from a range of options to maximize their achievement of positive livelihood outcomes rather than being forced into any given strategy. Thus, people's access to different levels and combinations of assets is probably a significant influence on their choice of livelihood strategies. Some activities require, for example, particular skills or may be very labour intensive (high levels of human capital required); start-up (financial) capital or good physical infrastructure for the

transport of goods (physical capital), a specific type/level of natural capital as the basis for production, or access to a given group of people achievable only through existing social connections (social capital). Different households will have different levels of access to this range of assets. The diversity and amount of these different assets that households have at their disposal, and the balance between them, will affect what sort of livelihood they can create for themselves at any particular moment (Scoones, 1998).

According to Ellis (2000), the reasons households pursue different livelihood strategies are often divided into two overarching considerations: necessity or choice. Necessity refers to involuntary and distressing reasons for diversifying livelihoods (such as fragmentation of landholding on inheritance, drought, flood, and civil wars, and loss of the ability to continue to undertake strenuous agricultural activities due to personal accident or ill health). Choice, by contrast, refers to voluntary and proactive reasons for diversifying (seeking out seasonal wages and educating children to improve their prospects of obtaining non-farm jobs or trading). Barrett *et al*. (2001) conclude that the poor have no other option but to diversify out of farming and into unskilled off-farm labour, whether in agriculture or not.

Specifically, Ellis (2000) identified four major factors for livelihood diversification: seasonality, risk strategies, coping strategies, and labour and credit market conditions. Seasonality refers to the heavy reliance of farming on weather conditions and/or fluctuations in prices due to changes in demand and supply conditions. Seasonality in crop production and income results in slack seasons during which farmers may have time to engage in off-farm activities. It is also possible that households diversify activities to improve the threat to their overall welfare from failure due to concentration on a single activity. Farm household diversification into non-farm activities emerges naturally from diminishing or time-varying returns to labour or land, from market failures or frictions (e.g., for mobility or entry into high-return niches), from ex-ante risk management, and ex-post coping with adverse shocks (Barrett *et al.,* 2001)**.**

Risk management strategies are often invoked to explain diversification behaviour (Ellis, 2000; Hussein and Nelson, 1999). The basic logic of this argument is that previous experience of crop or market failure can provoke diversification to spread perceived risk and reduce the impact of total or partial failure on household consumption. However, in

line with the finding of Barrett *et al*. (2001) showed that from the "push factor perspective", diversification is driven by limited risk-bearing capacity in the presence of incomplete or weak financial systems that create strong incentives to select a portfolio of activities in order to stabilize income flows and consumption, by constraints in labour and land markets, and by climatic uncertainty.

From the "pull factor perspective", local engines of growth such as commercial agriculture or proximity to an urban area create opportunities for income diversification in production and expenditure-linkage activities. The coping strategies argument resembles the necessity reasoning, which states that a household's diversification is a survival response to a crisis or disaster (DFID, 2001). Market conditions in rural Africa refer to market failures, leaving households to engage in activities to compensate for market failures, especially credit and labour markets. The absence of such markets requires households to take advantage of the demographic composition of households to use their resources effectively and respond to market failures (Barrett *et al*., 2001).

Transforming Structures and Processes can reinforce positive choices if they function well. However, in other cases, they can act as a significant constraint to choice, restricting access (e.g. in the case of rigid caste systems or state-dominated marketing systems), reducing the mobility of goods and labour and manipulating returns to given activities to make them more or less attractive (e.g. heavy-handed pricing policies) (DFID, 1999; 2000). Under such circumstances, people might be viewed as making 'negative choices regarding their livelihood strategies, or they may have no choice. In this regard, site-specific opportunities such as local market contingencies, development projects, infrastructure development (e.g. a new road), and personal contacts might play an essential role in pulling rural households towards livelihood diversification (Ellis, 2000; Meser and Townsley, 2003).

Bezemer and Lerman (2002) indicated that family size, farm size, access to credit, and household heads' secondary education were significant in determining the choice of livelihood strategies. In the case of Ethiopia, only a few studies dealt explicitly with the determinants of livelihood strategies. For instance, Davis, J. R.(2003) found out that most Ethiopians are 'sub-subsistence farmers' who have been forced to diversify into off-farm

incomes to bridge their annual consumption gap, while some are effectively landless and depend entirely on non-agricultural sources of food and income, including food aid. The typical rural livelihood strategy combines crop and livestock agriculture, off-farm income-generating activities (daily labour, petty trading, and seasonal migration) and dependence on food aid.

Rajadel (2003) attributed two general factors to livelihood diversification by local people, local characteristics and household characteristics. Opportunities to diversify into the non-agricultural sector depend on the region's development, the size and dynamism of the local market, and an urban centre's proximity. Local factors influence households' type of opportunities and incentives, but their characteristics determine their desire and capacity to diversify in the end. Social and cultural institutions can significantly impact poor households' access to resources. For instance, one cultural institution which has traditionally had a very significant impact on the access of different groups of people to a range of livelihoods assets is the construction and division of communities along the lines of caste, which has strongly influenced access to employment, education, property and services (Carswell, 2000).

According to Soussan *et al*. (2000), livelihood is influenced by a wide range of external forces, inside and outside the locality in which a household lives, beyond the family's control. This includes the social, Demographic, economic, and institutional dynamics of their local area, and the wider region, in the country and worldwide. Moreover, we live in an era of a globalized world. Its effects are felt by all, including people living in the remotest parts of the developing world (Rahman *et al*., 2007).

Lautzke (2003) pointed out that Ethiopians build livelihoods in agro-climatic zones with diverse, productive bases on livelihoods strategy. However, even within particular zones, the Livelihood strategy is not homogenous or even among individuals within households. Livelihood strategies and outcomes are sensitive to combinations of age and gender and other socially constructed identities/institutions such as class, education, ethnicity, and religion. It is also clear that livelihood strategies in Ethiopia are becoming more diverse.

Tesfaye L. (2003) revealed that insufficient landholding, food self-insufficiency, and low revenue from cash crop sales are positively and significantly associated with the

participation of rural households in off-farm and non-farm activities. Holden *et al*. (2004) indicated that land degradation, population growth, stagnant technology, and drought necessitates the development of non-farm employment opportunities in the area. Access to low-wage off-farm income is also restricted by a lack of employment opportunities since households otherwise would have more off-farm wage employment than observed.

Demographic factors mainly drive participation in off-farm activities. In contrast, land and other asset ownership, crop income, and demographic factors affect the intensity of off-farm activities. For example, initially, female-headed households and households with more landholdings subsequently realized more negligible diversification into off-farm activities. On the other hand, families with more considerable initial crop income from the primary harvest season realized a more significant income share from off-farm activities (Adugna, 2005).

Berhanu (2007) identified that participation in agriculture livelihood strategy is influenced by the size of arable land, sex of the household head, education level of household head, health, number of information sources, distance to market place and access to credit. On the other hand, diversifying from agriculture is influenced by the size of arable land, livestock ownership, age of household head, health, number of information sources, and distance to market.

Carswell (2000) on livelihood diversification identified a range of variables that influenced livelihood diversification on scale analysis indicated that market access, differentiated access to the resource, availability of land, access to transport, access to credit, sex of household head, household size were found to influence rural households access to resource and livelihood diversification. Similarly, non-farm and off-farm activities are carried out by a significant proportion of adults and contribute to livelihoods as these institutional arrangements have changed, so ‘diversification activities’ have become more visible. Therefore, considering the social contexts of livelihood change is critical for understanding livelihood change and the changing role and importance of diversification activities. In this regard, further investigation of the contribution made by the diversification activities to the welfare needs to be conducted (Carswell, 2000).

The recent study by Yishak *et.al.* (2014) on the rural household livelihood strategy options and determinants in the Wolaita Zone indicated that agro-ecology, sex, education level of household, farm size, livestock ownership, annual cash income, Chemical fertilizer use, age, and training determined the farmer's choice of livelihood strategies and that they varied across different groups.

2.3.Conceptual Framework

The study focuses on assessing existing diversified livelihood strategies and identifying the factors affecting diversified smallholder farmers' livelihood strategy choices. The study developed and used a framework to analyse the relationships between different factors and the choice of livelihood strategy (Figure 2). The key point in analyzing the livelihood framework emphasizes understanding and acting on people's survival capabilities. Usually, this investigation starts first and most with the household's assets (Adugna, 2008).

In this study, smallholders choose different kinds of livelihood strategies depending on heterogeneity in the livelihood assets base that they have. Understanding the diverse and dynamic rural livelihood situation helps identify the appropriate strategies for intervention and introduce new strategies that have a more significant impact on reducing household poverty levels. The conceptual framework has three components: Demographic factor, Institutional Factor, Scio Economic Factor and Diversified livelihood strategies (On-farm, off-farm, nonfarm). It shows that demographic, institutional and socio-economic factors impact the choice of diversified household.

CONCEPTUAL FRAMEWORK

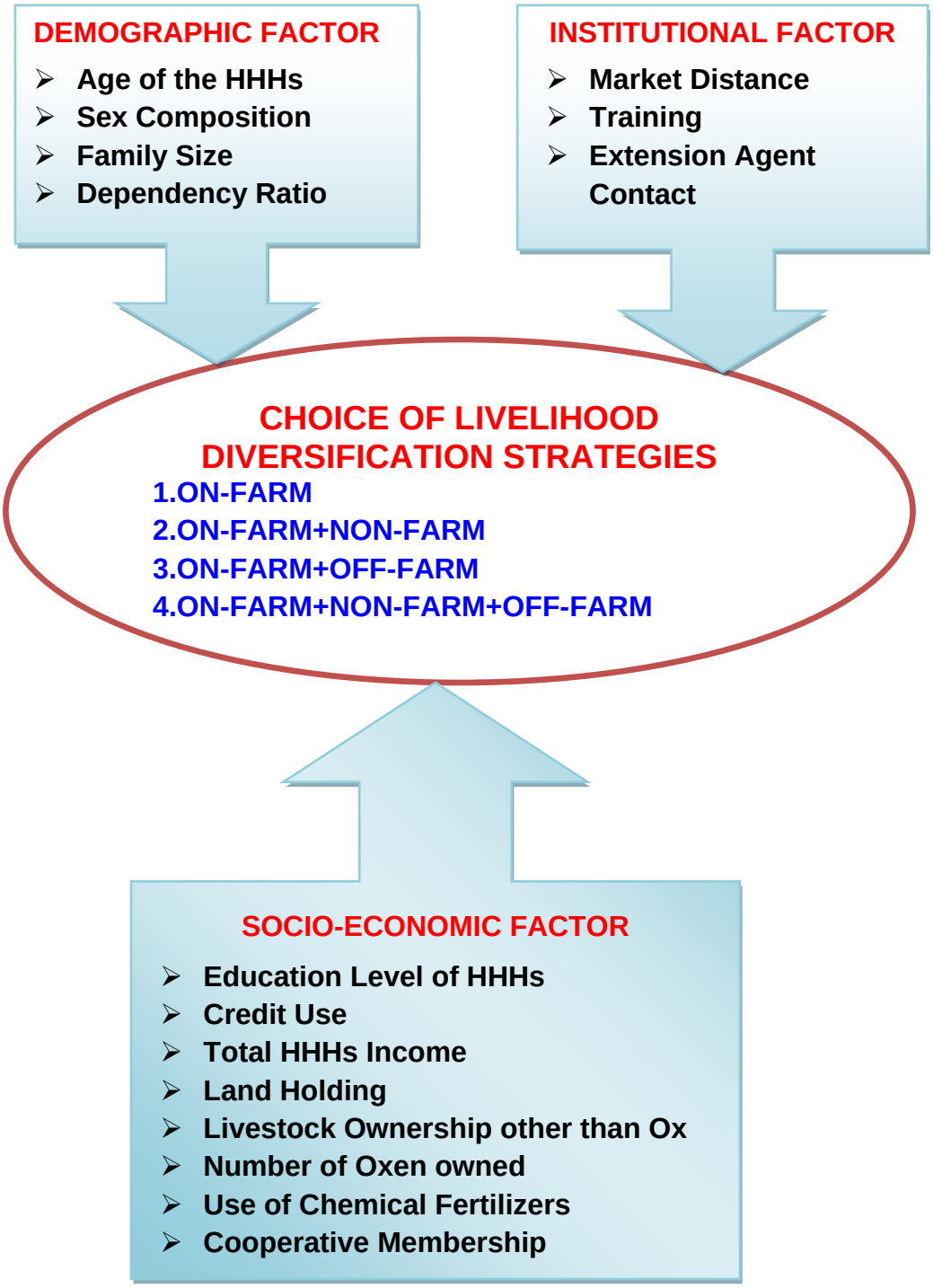

Figure 1: Conceptual Framework of the Study
Source: Adapted and developed from DFID, 2001

CHAPTER III

3. METHODOLOGY

3. METHODOLOGY

This chapter describes the study area, methods used to collect and analyze data, and the study variables with the working hypothesis. It starts by presenting and illustrating the geographical and agro-ecological characteristics of the study area. This is followed by a description of the survey design and sampling procedure, including sources and data types. Finally, it presents the multinomial logit model and the result of hypothesized variables.

3.1. Description of the Study Area

Boloso Sore Woreda is one of the 135 woredas in the Southern Nations, Nationalities and Peoples Region (SNNRP) State and one of 12 Woredas of the Wolaita Zone. It is located 300km to the Southwest of Addis Ababa, the capital city of Ethiopia. The total number of rural households in the woreda was 42 298, of which 89.9% and 15.1% were Male and Female households, respectively. The total population of the woreda was estimated to be 213,561, of which 48.8% were male and 51.2% were Female. The population density of Woreda was 637 persons per Km^2. The average household size was 5.1, and the dependency ratio was 91, among the highest in the country (CSA, 2014). The total land area of the woreda is 233.1$km^{2,}$ of which 86 % is midland and 14% is lowland, 65.8%is used to grow annual crops, and 13.3% is used for perennial crops.

The rest of the land is used for grazing, forest, degraded, and small land for other communal purposes. The District (Woreda) is predominantly rural and depends on agriculture. The significant economic activity is rain-fed farming, and major crops grown in the woreda include cereals, pulses and cash crops like coffee, fruits, and root crops. Maize is the dominant cereal crop grown. However, the area is known for its low productivity due to land scarcity, erratic rainfall, and crop disease prevalence. As a result, non-farm and off-farm activities are the second most important income source in the woreda. Trading is fundamental in generating income for non-farm and off-farm activities. Apart from trading, income from daily labour and seasonal workforce movement during harvest time is another source of income.

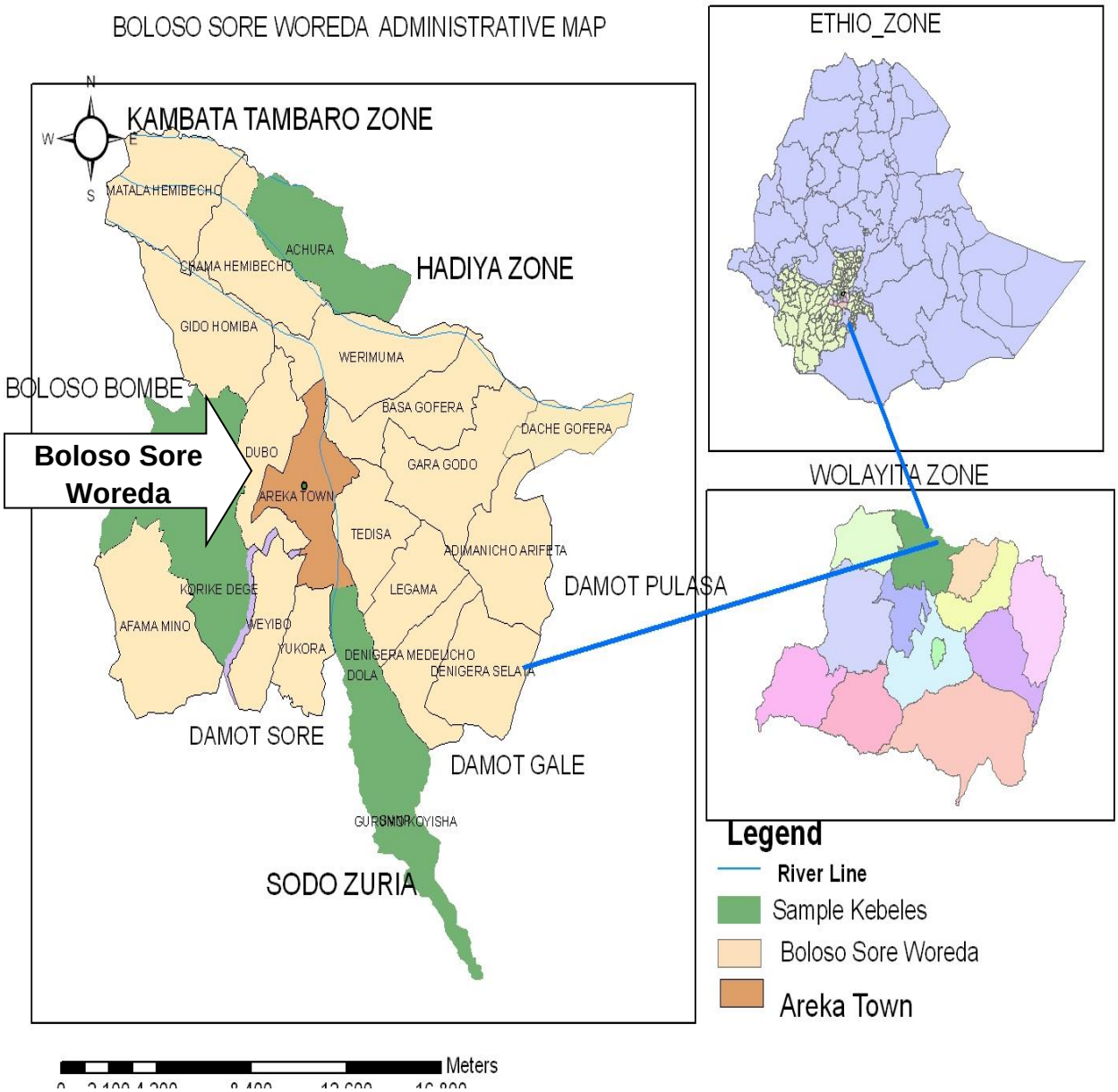

Figure 2: Map of the Study Area

Source: Ethio-GIS, 2014

3.2. Sampling Procedure

The basic unit of the study was rural farm households. A multi-stage sampling procedure was employed to select the sample households. In the 1st stage, the District/Woreda was classified into two agro-ecological zones; Mid-highland and Lowland. In the 2nd stage, Three Villages/Kebeles were selected from 25 Mid Highland Kebeles. Finally, one Kebele was selected from 4 Lowland Kebeles using a simple random sampling method and was applied to select the households from each of the Kebeles (Fig 3).

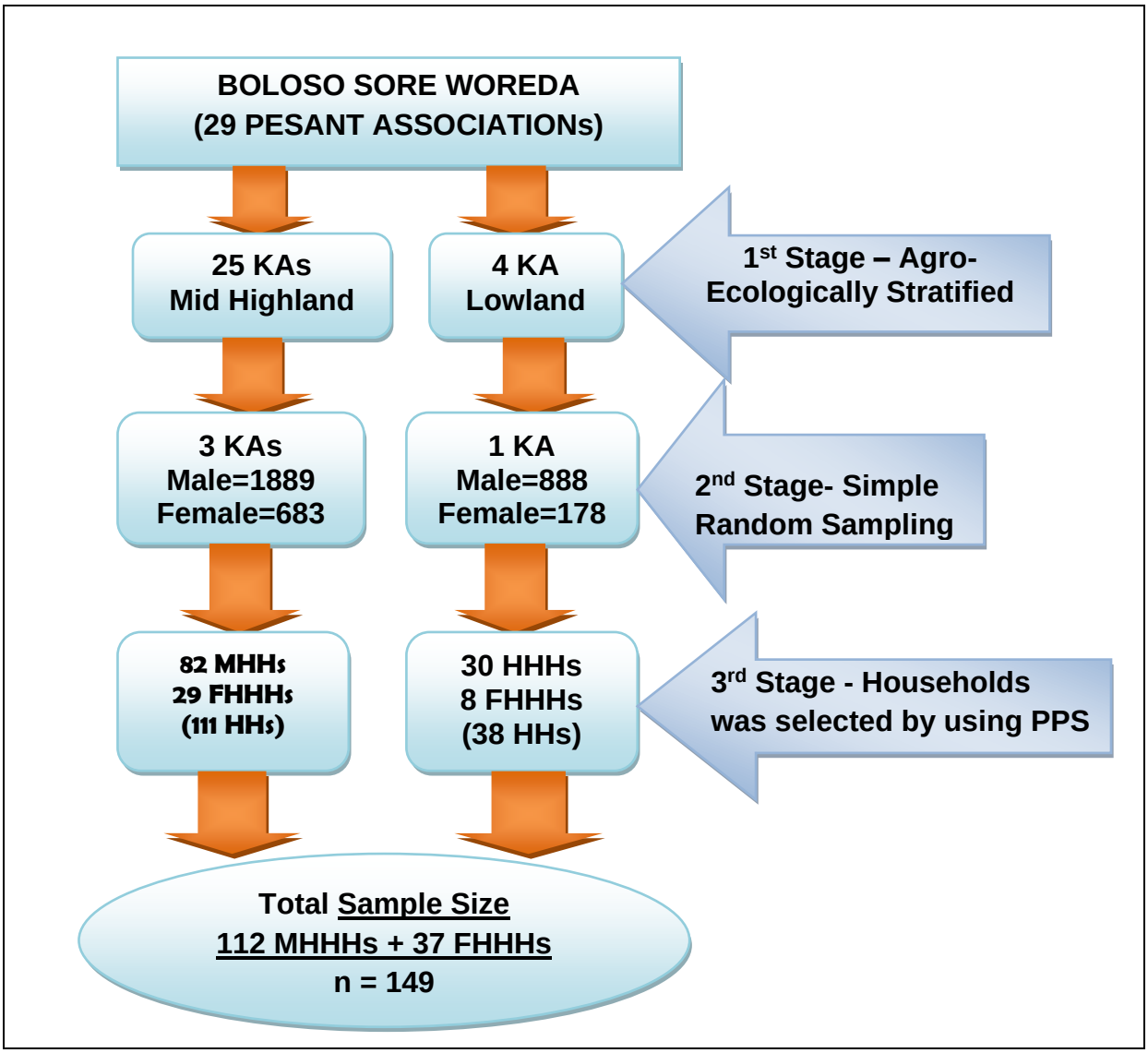

Figure 3: Sampling Procedure of the Study

For the supplementary qualitative study, representatives of the community concerning the gender balance, Kebele leaders, Development Agents, Kebele residents, Community Based leaders, and religious leaders for participatory wealth ranking were invited for Focus Group Discussion. The three wealth categories (Better-off, Medium, and Poorest of the Poor) were established based on the shared criteria (Table 1). The primary criteria for categorization were the size of cultivated land, the number of oxen and cows owned, the number of small animals, engagement in multiple activities, and ability to educate children at least at a higher level and type of living house. However, there were situations where the wealthy were those with more land or could be people with more livestock, and in some cases, a combination of criteria can be used.

Table 1: Sample Households by Kebeles Administration

Name of the Keble Administration Selected	Total Number of Households in Selected Keble			Total Sample Households Size
	M	F	Total	
Matala Hembe	643	190	833	36
Tadisas	564	201	765	32
Suye Homba	710	178	888	38
Gido Homba	682	292	974	43
Total	**2599**	**861**	**3460**	**149**

3.2 .1 Sample Size Determination

A simplified formula for proportions suggested by Yamane (1967) to calculate sample size is the desired level of precision between 95% confidence interval and usually does not exceed 5-10%. In this study, e is considered 0.08 (or 8%).

$$\mathbf{n} = \frac{N}{1 + N(e)^2}$$

Where n is the sample size, and N is the universe of population size, which is 3460 HHs.

Therefore, when the formula is applied to the above sample, the sample size necessary for the study is shown below.

Where;

n is the sample size,

N is the population size, and

e is the level of precision/error term = 8%

$$\mathbf{n} = \frac{3460}{1 + 3460(.08)^2} \quad \mathbf{149}$$

Therefore, the sample size required for the study was 149.

3.3. Methods of Data Collection

Primary data sources were sample households, key informants (KIs), and focus group discussants (FGDs. The sample household data were collected from the sampled households through a structured interview schedule. FGDs and KIIs were conducted in the sampled Kebeles using a checklist. Focus group data were collected from two randomly selected Kebele Administrations, Shuye Homba and Matala Hembecho. A total of 32 participants (16 from each two KAs) were selected from different community groups and attendants of the Focus group discussion. The interview focused on the demographic, socio-economic and institutional factors related to the choice of livelihood strategies. Boloso Sore Cooperative Office, Agricultural office, Omo Microfinance, Finance, Areka Research Center, Sport and Youth, KAs Administrators and Development Agent participated as Key Informants.

Four enumerators with the capacity, knowledge, and familiarity with the study area's culture and language were recruited and trained. The investigator conducted a pretest on the study instruments before data collection. Following the pretest finding, the interview schedule was upgraded. The secondary data were gathered from numerous sources like research journals and articles, internet sources and reports. The discussions focused on

wealth rankings, major livelihood strategies, and the dominant livelihood strategies and outcomes.

3.4. Data Analysis Techniques

The present study used descriptive statistics and econometric models to analyse households' collected data. First, the qualitative or categorical data types were analysed using percentages, chi-square test and frequency. On the other hand, the quantitative continuous data types were analyzed using one-way ANOVA, minimum, maximum, mean, and standard deviation. Then, the interpretation and tabulation of data were made following the study's conceptual framework. After computing the descriptive statistics, Multinomial Logistic Regression was applied to identify the factors associated with the household's choice of livelihood strategies. The data analysis was conducted using Statistical Package for Social Sciences (SPSS) version 20.

3.4.1. Factors affecting livelihood strategies of rural Households

When there are more than two alternatives that the decision-maker has to choose (unordered qualitative or polytomous variables), the appropriate econometric model is Multinomial logit or Multivariate probit regression models. However, the latter is less restrictive and challenging to estimate the covariance matrix of the βP (Greene, 2003; Judge *et al*., 1985) and was not preferred for this study. The dependent variable in this specific case, the choice of diversified livelihood strategy, is polytomous. Thus, a multinomial logit model was more appropriate for such a study because the categorical dependent outcome has more than two response categories (or levels) (Alwang *et al*., 2005; Brown *et al*., 2006; Jansen *et al*., 2004). However, it is worth noting that this model assumes that the choice probabilities implied by the model must satisfy an Independence of Irrelevant Alternatives (IIA) property. This means that the ratio of probabilities of any two choices in response categories will be the same, regardless of the other alternatives. In other words, the ratio of probabilities of any two choices for a particular observation is not influenced systematically by any other alternatives. Therefore, following Greene (2003), a multinomial logit model was used in this study to identify the determinants of the rural household's choice of diversified livelihood strategies.

3.4.1.1. Specification of Multinomial Logit Model

Rural households make many decisions in their daily activities. Economic theory suggests that agents choose what maximizes their expected utility given the situation (Moti and Gardebroek, 2008). To identify the determinants behind rural households' decision to engage in various livelihood diversification strategies, the assumption is that in a given period at the disposal of its asset endowment, a rational household head chooses among the available mutually exclusive livelihood strategy alternatives maximum utility. Following Greene (2003), suppose the i^{th} household is faced with j choices; we specify the utility choice j as:

$$\mathbf{U_{ij} = Z_{ij}\,\beta + \varepsilon_{ij}} \quad \text{.....(1)}$$

If the household chooses j in particular, we assume that U_{ij} is the maximum among the j utilities. So the statistical model is derived by the probability that choice j is made, which is:

Prob $\mathbf{(U_{ij} > U_{ik})}$ for all other $\mathbf{K \neq j}$……(2)

Where, $\mathbf{U_{ij}}$ is the utility to the $\mathbf{i^{th}}$ household from livelihood strategy **j,** and

$\mathbf{U_{ik}}$ the utility to the $\mathbf{i^{th}}$ household from livelihood strategy **k.**

Suppose the household maximizes its utility defined over income realizations. In that case, the household's choice is simply an optimal allocation of its asset endowment to choose the strategy that maximizes its utility (Brown *et al.*, 2006). Thus, the i^{th} household's decision can, therefore, be modelled as maximizing the expected utility by choosing the j^{th} livelihood strategy among J discrete livelihood strategies, i.e.,

$$\max_j = E(U_{ij}) = f_j(x_i) + \varepsilon_{ij};\ j = 0...J \quad \text{……(3)}$$

In general, for an outcome variable with **J** categories, let the $\mathbf{j^{th}}$ livelihood strategy that the $\mathbf{i^{th}}$ household chooses to maximize its utility could take the value 1 if the $\mathbf{i^{th}}$ household chooses the $\mathbf{j^{th}}$ livelihood strategy and 0 otherwise. The probability that a household with characteristics x chooses livelihood strategy **j,** $\mathbf{P_{ij}}$ is modelled as:

$$P_{ij} = \frac{\exp(X_i^{'}\beta_j)}{\sum_{j=0}^{J}\exp(X_i^{'}\beta_j)}, \quad \mathbf{j = 0...\ J} \quad \text{……..(4)}$$

With the requirement that $\sum_{j=0}^{J} P_{ij} = 1$ for any i

Where: $\mathbf{P_{ij}}$ = probability representing the i^{th} household's chance of falling into category j

X = Predictors of response probabilities

$\beta_j =$ Covariate effects were specific to the **j^{th}** response category with the first category as the reference.

Appropriate normalization that removes an indeterminacy in the model is to assume that $\beta_1 = 0$ (this arises because probabilities sum to 1, so only J parameter vectors are needed to determine the J + 1 probabilities) (Greene, 2003) so that $\exp(X_i\beta_1) = 1$, implying that the generalized equation (4) above is equivalent to

$$\Pr ob.(y_i = j / X_i) = P_{ij} = \frac{\exp(X_i\beta_j)}{1 + \sum_{j=1}^{J} \exp(X_i^{'}\beta_j)}, \quad \text{for j = 0, …J and}$$

$$\Pr ob.(y_i = 1 / X_i) = P_{i1} = \frac{1}{1 + \sum_{j=1}^{J} \exp(X_i^{'}\beta_j)}, \qquad \text{.....(5)}$$

Where: y = A polytomous choice variable with categories coded from 0… J.

Note: The probability of P_{i1} is derived from the constraint that the J probabilities sum to 1. That is, $p_{i1} = 1 - \sum p_{ij}$. Similar to the binary logit model, it implies that we can compute J log-odds ratios, which are specified as;

$$\ln\left[\frac{p_{ij}}{p_{iJ}}\right] = x'\left(\beta_j - \beta_J\right) = x'\beta_j, if, J = 0 \qquad \text{.....(6)}$$

3.4.2 Definitions of Variables and Research Hypothesis

3.4.2.1 Dependent Variables

The dependent variables of the model, the polytomous dependent variables for the determinants of rural households' choice of livelihood strategies, are specified as;

Y=1, if the choice lies in On-farm alone

Y=2, if the choice lies in On-farm + Nonfarm activities

Y=3, if the choice lies in On-farm + Off-farm activities

Y=4, if the choice lies in On-farm + non-farm, + off-farm activities

3.4.2.2 Hypothesis of Independent variables

Rural livelihood choice is expected to be affected by the influence of different variables in the study area. However, the magnitude of the influence of each variable across the household wealth category depends on the nature and characteristics of the household's inclination towards the positive choices of livelihood strategy. Thus, in order to address the issue of how the household livelihood strategies choices are determined by the role of basic assets within the heterogeneous nature of rural areas, clustering the sample households into livelihood strategy groups and by wealth category was carried out analytically as an effective procedure and analysis of diversified livelihood strategies choices from the angle of basic asset which controlled the household's livelihood choice based on a set of pre-determined determinant variables listed below.

Age of household Head (AGE):-Age was found to be significantly and positively associated with the farmers' engagement in off/non-farm activities. Most of the time, the livelihood options, especially off-farm and non-farm activities, are expected to be performed by younger farmers and are more active in condensing the opportunity due to better access to information, education and training. The probability of individual households migrating to search for off-farm or/and non-farm livelihood options decreases with age due to social prestige and respect. In addition, the younger farmers hope to see a bright future with a high level of family income, food self-satisfied, a large number of livestock, stable life and social respect so that they are more diverse in off-farm and/or non-farm livelihood choices than older framers (Ayele Tesema, 2008). Therefore, this variable was hypothesized to be positively associated with the choice of diversified livelihood strategies and continuous variables.

Sex of the Household Head (Sex):-Household head is a person who economically supports or manages the household. It could be Male or Female. Male-headed households

have more access to agricultural technologies, labour power, and farmland than female-headed households. At the same time, women farmers may need a long adjustment period to diversify their income sources fully (Adugna Eneyew, 2008). Hence, it hypothesized that male-headed households choose Diversified livelihood strategies more than Female household heads. Therefore, this variable was hypothesized to be negatively associated with the choice of livelihood strategies and dummy variable.

Family size of HH (FSHH): Refers to the total number of household members in a given family. The larger size of the family, accompanied by the more dependency ratio, results in livelihood insecurity in farming households (Bezmer *et al.,* 2002). Households with relatively larger family sizes fell under the cluster of non-farm and the combination of other alternatives to meet the necessities of the family members. Therefore, family size is hypothesized to correlate positively with diversified livelihood strategies and continuous variables.

Educational level of household head (EDU): Educational level of the household head is a continuous variable taking years of schooling. The household head's education level, in particular, and the members' education levels generally affect the households' livelihood in various ways (Tesfaye L., 2003 Adunga, 2008). Therefore, it is assumed that formal schooling is expected to enhance farmers' ability to perceive, interpret, and respond to new events. As a result, the farmers with higher schooling years are better positioned to know about effective and diversified livelihood strategies. They can increase their adoption rate of new information and technologies. Therefore, this variable is hypothesised to impact the choice of diversified livelihood strategies positively.

Dependency Ratio (DEPRATIO): Dependency ratio refers to the family member under 14 and above 65 years old who are unproductive family members and dependent on other family aged between 15 and below 65 years who participate in the choice of diversified livelihood strategies to acquire necessities for family live (Dejene Negassa, 2001). Households with a high dependency ratio are more likely to diversify in off/non-farm activities. When the number of dependents in the family increases, the burden and responsibility lie down on active labour family members to fulfil necessities for the

dependent family members. So to ensure family life, those active family members engaged in non/of farm activities to realize the family's basic needs (Galab *et al.,* 2002). Therefore, the dependency ratio was hypothesized to influence the choice of livelihood strategy and continues positively.

Training (TRIN): training enhances farmers' agricultural production skills, knowledge and experiences. Rural households who participated in agricultural or non-agricultural training are most likely to diversify their likelihoods into non-farm and off-farm activities than those farmers who have no participation in any training because training improves the production and productivity of agricultural and non-agricultural sectors, which helps farm households to accumulate more income and additional assets by participating in non-farm activities due to increased skill and knowledge. In other words, non-agricultural training develops the entrepreneurial skill of the farmers to engage in additional income-generating activities and agricultural production. Furthermore, integrating agricultural training with non-farm enterprise training can help HHs manage and market their farm production more effectively and take advantage of new off-farm/non-farm livelihood opportunities that supplement agricultural production. Dilruba and Roy (2012) said that the households who participated in the training are more likely pursuing livelihood strategies in combination with off-farm and non-farm. Thus, training participation is expected to correlate with livelihood diversification and Dummy Variable positively.

Land Size is owned in hectares (LAND): this variable is continuous and represents the total arable land in hectares that a household owns. This variable is a fundamental asset for the majority of rural households. Owning a larger land area can be a means of accumulating wealth and a source of animal feed. More land holding means more cultivation and possibility of production, increasing farm income and improving food security Tesfaye L., (2003). Access to more arable land increases the opportunity to participate in agriculture livelihood activities. Therefore, landholding size is hypothesised to negatively affect HH's decision to participate in different livelihood strategies.

Use of chemical fertilizer (CHEMFERT): Farm inputs refer to chemical fertilizers such as DAP and UREA, a dummy. Households using fertilizer are expected to have better food

production capacity than non-users. Using chemical fertilizer improves productivity per unit area, which is an intensification of agricultural strategy and helps the household meet food needs. However, adopting improved farm technologies such as fertilizer can result in an insignificant income increase for adopters (Beyene *et al.,* 2000). Thus, in this study, a household that could have used chemical fertilizer is hypothesized to affect livelihood strategies negatively.

Membership in cooperatives (COOPMEM): it represents whether a household is a member of cooperatives or not. It is a dummy variable of which the value is 1 if the household head is a member and 0 otherwise. A membership in cooperatives increases a household's access to services that might be granted by being a member. In Ethiopia, cooperatives are promoted by the bureau of the cooperative. For both off-farm and non-farm diversification strategies, it would appear that social networks that facilitate the sharing of farm equipment and labour and membership in community groups are essential assets for the poor as access to different services (Galab *et al.* 2002). Such access could give a chance to get more support and enable the household to generate more income by participating in different livelihood activities. Therefore, it is hypothesized that this variable positively correlates with farmers' choice to participate in different livelihood strategies.

Livestock holding rather than oxen holding (LIVSTCK): livestock owned by households is a continuous variable measured in tropical livestock units (TLU). Livestock determines wealth status and is used for draught power and as a source of food and income. The household with a larger size of livestock has a better chance of having a better income from livestock. The more livestock owned by the household, the less possibility of households' choice to participate in off / non-farm activities and linearly correlated agricultural activities (Galab *et al.,* 2002). Therefore, the possession of large livestock numbers was expected to negatively affect the household decision to opt for different (Off/Non-farm) livelihood strategies.

Number of ox/oxen owned (OXEN): It is a continuous variable and the primary source of traction power in traditional means to cultivate land in Ethiopia. It allows effective

utilization of land and labour resources where family labour could be spread over peak and slack periods to carry out the farm and non-farm activities. In this case, households with less/no ox ownership are forced to engage in additional income-generating activities. In addition, farm households that do not own ox may produce less agricultural production on their farm due to improper ploughing of land resources, resulting in low income. On the other hand, farmers with more oxen are expected to spend more time on their farms and rely more on crop production. In this regard, having a more significant number of oxen in the household decreases the household's probability of engaging in on, off and non-farm activities. Thus, it was hypothesized that the large number of oxen owned is negatively correlated with the diversification of livelihood strategy choices in off/non-farm activities.

Distance from Market Centre (MKTDIST): it is a continuous variable designating HHs proximity to the nearest market centre measured in kilometres. Proximity to the marketing centres reduces the cost of time and labour that the farmer spent walking. In addition, market access may create more income opportunities by providing non-farm/off-farm employment opportunities and access to input and transportation (Fitsum and Holden, 2003). The other advantage is that the more a farmer is near marketing centres, the more knowledge about the market condition helps increase their bargaining power. Therefore, this variable was expected to affect household participation in different livelihood strategies negatively.

Credit Use (CREDIT): Credit refers to the availability of financial resources, that is, and rural financial services are about providing financial services-secure savings, credit, financial transactions, money transfer services for remittance and insurance in rural areas. The ability of rural households to make long-term investments ensures that an economy's financial services shape time-patterned income flow. Credit use refers to whether the household uses credit or not. It is a dummy variable, which takes the value of 1 if the farm household uses credit and 0; otherwise, according to Adugna (2008), credit is considered an essential source of investment and helps improve households' livelihood strategies. Households with better access to credit can invest in preferred livelihood strategies, improving livelihood status. Therefore, this variable was hypothesized to positively associate households with livelihood strategies choices in Off/Non-farm activities.

Total Annual Cash Income (INCOME): Income refers to the financial capital that farm households own in cash. It is one of the critical assets of rural household livelihood strategy. The maximum potential of rural households is to engage in Off/Non-farm activities regarding the opportunity of total cash income on hand. Households having significant cash income are more likely to diversify their livelihood strategies into non-farm and/or off-farm activities. In contrast, those farmers with low income are less likely to diversify livelihood strategies into non-farm and/or off-farm activities. Farmers with adequate income can overcome financial constraints to engage in alternative livelihood strategies (Yishak *et al.,* 2014). Thus, higher income can encourage rural households to invest in other income-generating activities, especially non-farm activities, and are expected to be positively associated with the diversification of livelihood choices in off/non-farm activities and continuous variables.

Contact with Development Agent: It is a dummy variable taking value 1 if the household head had contact with the extension agent for the past months (at the time of data collection). The agricultural extension service provided by the Ministry of Agriculture is the primary source of information on agriculture and natural resource conservation. The additional advantage is that it increases the sustainable use of natural resources and high-return household strategies. Moreover, the stronger the linkage between farmers and development agents, the better the information flow and the technological (knowledge) transfer, and it helps to adopt valuable extension advice and improve agriculture productivity (Adugna, 2008).

Therefore, it was expected to have a negative relationship with farmers' participation in the choice of diversified livelihood strategies to reduce income poverty at the household level with the help of such support.

Table 2: Summary of hypothesized explanatory variables that are expected to affect the choice of livelihood strategies

Variable	Definition	Type	Value/measure	Expected Sign
AGEHHH	Age of household head	Continuous	Year	+
SEXHHH	Sex of household head	Dummy	1=Male 0=Female	-
FAMLISIZE	Family Size	Continuous	AE	+
EDUHHH	Educational level of head	Dummy	In Categorical form	+
DEPRTIO	Dependency ratio	Continuous	Ratio	+
TRAIN	Agricultural Training	Dummy	0=No 1=Yes	+
LAND	Cultivated Land Holding	Continuous	Hectares	-
CHEMFERT	Use of Chemical Fertilizer	Dummy	0=No 1=Yes	-
COOPMME	Cooperative Membership	Dummy	0=No 1=Yes	+
LIVSTCK	Livestock holding	Continuous	TLU	-
OXEN	Oxen holding	Continuous	Number	-
MKTDIS	Distance to Market	Continuous	Kilometres	-
CREDIT	Credit Use	Dummy	0=No 1=Yes	+
INCOM	Total annual cash income	Continuous	Birr	+
EXTCON	Extension Contact	Dummy	Frequency	+

Source: Own Computation, 2016

CHAPTER IV

4.DATA ANALYSIS AND RESULTS

4. DATA ANALYSIS AND RESULTS

This chapter deals with the results of descriptive statistics, inferential statistics and multinomial regression output for the determinants of choices of livelihood strategies. Section 4.1 deals with the analysis of livelihood Strategies 4.2 descriptive and inferential analysis of the independent variables, 4.3. Factors Affecting the Choices of Diversified Livelihood Strategies, 4.4 Multivariate Multinomial Logistic Regression (independent explanatory factors), 4.5 Summary of the Qualitative analysis.

4.1. Livelihood Diversification Strategies

The study's dependent variable was the choice of diversified livelihood strategies identified by the participants as Y_0 = On-farm alone, Y_1 = On-farm+Non-farm, Y_2 = On-farm+off-farm, Y_3 = On-farm+Non-farm+Off-farm (Adugna, 2008, Gebrehiwot, and Fekadu 2012, and Yishak, *et al.,* 2014).

Table 3: Distribution of sample households by Livelihood Diversification Strategies

Livelihood Strategies	**Total (n=149)**	
	No.	**%**
On-farm	63	42
On-farm + Non-farm	55	37
On-farm + Off-farm	20	14
On-farm+Off-farm+Non-farm	11	7
Total	**149**	**100**
χ^2	**39.811**	
P-value	**0.000*** **	

******, Indicate significance at 1%, provability level, respectively.***
Source: Survey Result, 2016

According to the survey result, the most common choices of diversified livelihood strategy pursued by the households were the on-farm option which is purely cropped and livestock production only, and the following options were pursued in decreasing order, i.e. on-farm+

nonfarm, On-farm + Off-farm and combination of on-farm + non-farm + off-farm activities. Out of the total 149 sample households, 42% of households were solely dependent on on-farm alone, 37% HHs led their choice of diversified livelihood with on-farm + non-farm, 14% of households derived their choice of diversified livelihood from on-farm + off-farm, and 7% of HHHs diversified their choice of livelihood from on-farm + non-farm+ off-farm choice of diversified livelihood activities (Table 3).

4.2 Descriptive and Inferential Analysis

Household decision to choose livelihood strategies is the cumulative sum of different factors. This section explains the results of descriptive and inferential analysis of the household demographic, institutional and socio-economic factors linked to the choice of livelihood strategies pursued by rural households (Table 4 and Table 5).

Table 4: Descriptive of Continuous Explanatory Variables

	Rural Households diversified Livelihood Strategy choices									
	On-farm alone		On-farm + Non-farm		On-farm + Off-farm		On + Off-farm + Non-farm			
Variables	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**F-test**	**P-value**
AGEHHH	50	6.39	41.84	3.2	44	3.6	43	4.3	29.5	0.000***
FAMLSIZE	4	1	7.5	1.2	7.85	0.93	8.82	1.3	49.1	0.000***
DEPRTIO	2.56	0.56	4.65	1	5.25	0.78	5.72	0.64	17.7	0.000***
LAND	1	0.88	0.37	0.51	0.06	0.19	0.18	0.056	17	0.000***
INCOME	1265	1421	2071	2672	1638	1982	2123	2732	2.62	0.053*
MARKDST	5.62	2.9	2.27	1.4	4.44	1.46	2.3	1.65	86	0.000***
LIVSTOCK	3.3	2.6	1.57	1.5	0.66	0.81	0.81	1.16	13.99	0.000***
NOOFOXE	0.69	0.67	0.38	0.32	0.25	0.38	0.24	0.39	4.5	0.004***
EXTAGCO	6.30	2.85	3.06	2.25	3.96	1.28	3.94	1.55	12.6	0.000***
Total HHs	63		20		55		11		149	

Source: Survey result, 2016

4.2.1. Demographic Factors

In this study, the demographic factors include age composition, sex (gender), educational level, dependency ratio and family size of the participants (Table 4 and Table 5).

4.2.1.1. Age Composition

The age of the household head is related to activeness and potency to engage in different livelihood strategies. This study hypothesized that older HHH is expected to be less active and rely more on On-farm activities than off/non-farm ones. The younger household head was more likely to diversify the different livelihood strategies. In the survey, the average age composition of the sampled household heads was 50, 41.84, 44 and 43 for On-farm, On-farm + non-farm, On-farm + off-farm and On-farm + non-farm +off-farm response categories of the choice of diversified livelihood strategy, respectively. The age distribution of the participants ranged from 35 to 65 years. The mean age of the sample households who pursue On-farm is older than those young households engaged in the non/off-farm livelihood alternatives other than on-farm. This result implies that the younger farmers were, the more concentrated under cluster off-farm and non-farm choice of diversified livelihood alternatives. At the same time, older aged farm households were more compatible with on-farm activities.

The possible justifications for these conditions could involve the households in activities other than on-farm activities, i.e. they were more likely to be performed by the younger farmers than the older farmers because the younger farmers are more active than, the older farmers. Asset availability is the main base for a household's positive livelihood choices. Access to available resources is one of the turning points in the livelihood choices of sample households in the study area. In this case, the younger farmers possessed lesser asset endowment, so they were poorer than the older farmers. They had engaged in multiple sets of activities to overcome the crisis of asset shortage. In this regard, the asset push factor repelled them from engaging in off/non-farm activities. The mean comparison revealed that there is a statistically significant difference among the sample households in the choice of livelihood strategies ($p<0.1\%$) (Table 4).

Table 5: Descriptive of the Dummy Explanatory Variables

Rural Households Livelihood Strategy choices										
	On-farm alone		On-farm + non-farm		On-farm + off-farm		On-farm + off-farm + non-farm			
Variables	**N.**	**%**	**N.**	**%**	**N.**	**%**	**N.**	**%**	**χ^2-test**	**P-value**
SEXHH										
Female	19	30	8	14.5	7	35	3	27.27	8.966	0.030**
Male	44	70	47	85.5	13	65	8	72.72		
TRAIN										
Trained	29	46	12	22	4	20	3	27.27	0.81	0.964
Not-trained	34	54	43	78.18	16	80	8	72.72		
CREDIT										
User	12	19	20	36.36	6	30	6	54.54	3.858	0.287
Non-user	51	81	35	63.63	14	70	5	45.45		
COOPMEM										
Member	17	27	23	42	9	45	3	27.27	13.48	0.004***
Not-member	46	73	32	58	11	55	8	73.73		
CHMFERT										
User	50	79.4	21	38.18	4	20	1	9.1	7.160	0.067*
Not-use	13	20.64	34	61.81	16	80	10	90.9		
EDUCLEV										
Illiterate	48	76.20	16	29.09	5	35	3	27.27	25.879	0.002***
Grade 1-4	13	20.63	30	54.54	10	50	4	36.36		
Grades 5-8	2	3.17	9	16.36	4	20	3	27.27		
Grade 9-12	0	0	0	0	1	5	1	9		
Total HHs	**63**		**55**		**20**		**11**		**149**	

4.2.1.2 Sex Composition

In this detailed survey, among 149 sample households, 37 Female-Headed Households and 112 Male Headed Households were involved in each choice of diversified livelihood. Accordingly, a total of 37 female HHs involved on (19 on-farm alone, + 8 On-farm + Nonfarm, 7 on-farm + off-farm and 3 on-farm + nonfarm + off-farm) and 112 Male HHs involved on (52 on-farm alone, + 47 On-farm, + Nonfarm, 13 on-farm, + off-farm and sex 8 on-farm,+ nonfarm, + off-farm) participate on each choice of livelihood and the coverage

is 25%(37) and 75% (112), Female and Male respectively. Most (85.5%) of male-headed households are involved in non-farm income-generating activities in addition to agriculture, while (14.5%) of female-headed households pursue non-farm livelihood options. This result indicates that non-farm livelihood options like petty trade and related income-generating options are more dominated by male members of the study. In other words, the opportunities for off-farm and non-farm choices of diversified livelihood strategy alternatives are limited for female households in the study. This also indicates how women are left with agricultural and housecare activities that are only performed on the farm for different reasons. As a result, female-headed households possessed very low resource endowments and were poorer than male-headed households. The chi-square test showed that the choice of livelihood strategies depended on the respondent's sex ($p<0.05$) (Table 5).

4.2.1.3. Dependency Ratio

The dependency ratio of household members refers to the ratio of members whose age is less than 15 years and above 64 years to the number of persons in the age group 16 - 64 years (active labour force). In this study, the mean dependency ratio of rural households who pursue on-farm only, on-farm + non-farm, on-farm + off-farm and the combination of on-farm + nonfarm+ off-farm livelihood alternatives are 2.56, 4.65, 5.25, 5.72 with a standard deviation of 0.56, 1, 0.78, and 0.64 respectively. This indicates that households with a more significant number of dependent family members were engaged in multiple livelihood options to fulfil the needs of their family members by pursuing a combination of livelihood strategies choices. The mean comparison shows a statistically significant difference of less than 1% among the sample households that adopted varying livelihood strategies (Table 4).

4.2.1.4. Family Size

In the present survey, the family size of the sample households ranged from four to ten among the sample households. The average household size of the total sample was 5. The mean family sizes of households who pursue On-farm, On-farm + non-farm, on-farm+ off-farm, and the on-farm + non-farm+ off-farm livelihood alternative were 4, 7.5, 7.85, 8.82 with standard deviations of 1, 1.2, .93, 1.3, respectively. This result indicates that

households with larger family sizes fall under the cluster of non-farm, off-farm, and the combination of on-farm + nonfarm + off-farm to meet the necessities of the prominent family members. Furthermore, the mean comparison has revealed a statistically significant mean difference in the family size among the sample households who have chosen livelihood diversifying strategies at less than a 1% probability level (Table 4).

4.2.2. Institutional Factor

In this study, institutional factors refer to community and broader institutional claims that individuals and households draw under their belonging to institutions of varying inclusiveness. It is also identified as s networks or structures like Market access, Extension Contact and Training.

4.2.2.1. Proximity to Market

There are five prominent marketplaces in the study area: Areka, Hadaro, Woibo, Gara Godo and Bombe markets. This study indicated the mean distance between the homesteads of the sample households and the nearest marketplace. The mean distance of the sample households pursuing On-farm, on-farm + non-farm, on-farm + off-farm and a combination of on-farm + nonfarm + off-farm were 5.62, 2.27, 4.44 and 2.3 km, respectively, from their nearest market centre. This result indicated that non-farm and off-farm choice households whose settlement is relatively near the market centres are more engaged in off-farm. On the other hand, non-farm livelihood alternatives and on-farm households are relatively far away from the market centre. Therefore, they are pursuing agriculture only because they have no opportunity to get information about the market and no access because of far from the market.

Furthermore, it also indicates that the patterns of household settlement determine the probability of rural households' engagement in off/non-farm livelihood options because, when the remoteness increases, the physical access to the market decreases and the transportation and marketing cost increases. This situation discourages farmers from participating in off/non-farm options with various risks and challenges. Based on this argument, this variable has significantly affected the sample households' livelihood options.

The mean comparison revealed a statistically significant difference among the sample households choosing livelihood strategies at less than a 1% probability level (Table 4).

4.2.2.2. Training

In this particular survey, out of 149 sample households, 29, 12, 4, and 3 trained on, on-farm only, on-farm + non-farm, on-farm + off-farm and the combination of on-farm + nonfarm+ off-farm livelihood alternatives with a percentage of 46%, 22%, 20%, and 27.27% respectively. This indicates that households participated in different parts of on-farm and non/off-farm training. Of these households participating in the training, 27.27% drove their income from on-farm + non-farm + off-farm livelihood strategies. On the other hand, most households (46%) are pursuing on-farm livelihood choices. This result indicates that the training focused on on-farm (Farming) livelihood strategies rather than related training to engage in off-farm and non-farm livelihood opportunities in the study area. Training in the area has no statistically significant association with household choice of livelihood strategy between Trained and not trained (Table 5).

4.2.2.3. Contact with Agricultural Extension Agents

Contact with extension workers delivers services like advice, demonstration, information and distribution of input to rural households. In the study area, households with frequent contact with extension personnel performed better in their agricultural production and were rewarded for agricultural production. The survey result in this particular study obtained from the sample households interview showed that the mean frequency of extension contacts appeared was 6.30, 3.06, 3.96, and 3.94 for On-farm, On-farm + Non-farm, On-farm + Off-farm and On-farm + off-farm + Non-farm choice of livelihood strategies pursuing households, respectively. This result indicates that households with a relatively higher frequency of extension contact are more engaged in On-farm alone than those engaged in the additional livelihood strategy options. In this regard, the mean comparison has depicted a statistically significant difference at less than a 1% probability level regarding extension contact among the sample households who have adopted varying livelihood strategy choices (Table 4).

4.2.3 Socio Economic Factor

In this study, Credit use, Total Income, Land Holding, Livestock ownership, No of Oxen, Chemical fertilizers and Cooperative Membership were identified as Economic factors that is a vital instruments to conducting any choice of livelihood strategies and choices at the household level.

4.2.3.1 Cultivated Land Size in Hectares

The farming activity provides the primary source of choice of livelihood strategies for the sample households. Therefore, the land is the most crucial economic source for agricultural activity. All households have their own land in the study area, but the size is different from one household to another. The cultivated landholding of all the sample households ranged from 0.125 hectares to 2.25 hectares, which varied along with the different choices of livelihood strategies. Therefore, the mean cultivated land size for households who choose livelihood strategies of On-farm alone, On-farm + non-farm, On-farm + off-farm, and On-farm + nonfarm + off-farm were 1, 0.37, 0.06 and 0.18 hectares, respectively. This indicates that households with relatively larger farm sizes pursue an on-farm livelihoods strategy, and households with smaller landholdings pursue other alternatives away from on-farm. According to the result, sample households with smaller land sizes combine the livelihood alternatives to maximize their income earning potential and utilization. The mean comparison revealed that the mean difference in landholding is statistically significant among the sample households who pursue the choice of livelihood strategies at less than a 1% probability level (Table 4).

4.2.3.2. Use of Chemical Fertilizers

The ultimate goal of using chemical fertilizer is to increase the production and productivity of the yield of agricultural products. The farm inputs the farmers accessed were inorganic fertilizers such as UREA and DAP. The result of the survey data shows that households who use both DAP and UREA fertilizer by per cent (79.4%, 38.18%, 20 % and 9.1%) are using chemical fertilizer under livelihood strategy groups On-farm alone, On-farm + off-farm, On-farm + Non-farm and the combination of on-farm alone, on-farm + non-farm, on-

farm + nonfarm + off-farm. In this case, most (79.4%) on-farm sample households applied chemical fertilizer on the farm. This result indicates that households who dependently on On-farm possess comparatively more significant landholding and more users of chemical fertilizer than those who engaged in off/on-farm livelihood choice. This shows that households engaged in an on-farm livelihood strategy have large hectares of land and use a large amount of fertilizer.

On the other hand, others engaged on, non-farm and off-farm have small and fragmented land holdings that use fertilizer to produce more products in a small area. The variation in the use of agricultural inputs due to their economic background can better be understood in the choice preference of their livelihood strategies. The chi-square test reveals that the choices of livelihood strategies of the sample households are dependent on fertiliser use, and the association is statistically significant at less than a 10% probability level (Table 5).

4.2.3.3. Livestock Holding

In the study area, livestock is considered one indicator of wealth status and is used as a source of income. Households owning more livestock are considered wealthy farmers in the community. It is also one of the most critical and crucial assets that farmers heavily depend on to safeguard their households from internal and external shocks. The mean livestock holding of households whose livelihood strategy is on-farm alone, on-farm + non-farm, on-farm + off-farm and on-farm + nonfarm+ off-farm livelihood strategy was 3.3 1.57, 0.66 and 0.81, respectively. This result indicates that households with relatively large livestock holdings are engaged in on-farm activities compared to those households with less livestock. In this regard, on-farm households with large livestock earn more income from livestock and livestock product sales; in contrast, those households with comparatively fewer holdings are pursuing off and non-farm livelihood options to compensate for the scarcity of income at the household level. The mean comparison revealed a statistically significant difference among the sample households in the choice of livelihood strategies at a less than 1% probability level (Table 4).

4.2.3.4 Number of Oxen Owned

In the study area, Households owning more oxen are considered wealthy farmers in the community. Oxen are the main source of traction power for rural households in the study area. The survey result, of mean of oxen holding of sample households were (0.69, 0.38, 0.25, and 0.24) for On-farm, on-farm + non -farm, On-farm + off-farm and On-farm + non-farm + off-farm livelihood strategies. This result indicates that households with relatively large oxen holdings are relatively engaged in on-farm activities compared to those with fewer oxen holdings. In this situation, oxen's availability helped rural households perform better on their farm and efficiently utilize the available land resources to generate more income.

On the other hand, households with fewer oxen holdings performed less or utilized their land resources and earned less income from agriculture than those with a large number of oxen holdings. In this regard, poor households whose oxen holding are significantly less, or almost no, were engaged in off-farm and non-farm livelihood options to overcome the crisis of income scarcity. The mean comparison has revealed a statistically significant difference among the sample households in the choice of livelihood strategies at less than a 1% probability level (Table 4).

4.2.3.5 Credit Use

The descriptive result of this particular study showed that 30 per cent of the sample households received credit while 70 per cent did not receive it for various reasons. Among households who accessed credit services 19%, 36.36%, 30%, and 54.54% pursued On-farm, On-farm + nonfarm, On-farm + off-farm and On-farm + on-farm + off-farm livelihood strategy choices, respectively. The study showed that the on-farm livelihood group used (19%) of credit, and relatively (36.36%) per cent of credit was used by On-farm and non-farm livelihood groups. This result indicates that households pursuing On-farm households have relatively better land holding, livestock ownership and cash income. They can buy improved seed, fertilizer, and necessities for their family on their own saved money rather than seeking credit through borrowing; on the other hand, households who pursue the least incentive options like off-farm and non-farm combinations are comparatively more inferior in land holding, livestock holding, and cash income due to limited capital and

dependent of the external sources of credit in the form of a loan. Credit in the area has no statistically significant association with household choices of livelihood strategy between users and non-users (Table 5).

4.2.3.6 Cooperative Membership

In the study area, out of 149 sample households, 52 households were members of cooperatives. Among the total cooperatives 17, 23, 9, and 3 of the sample households are pursuing on-farm, on-farm + non-farm, on-farm + non-farm and on-farm + Nonfarm+ Off-farm livelihood alternatives. This indicates that households pursuing the on-farm and non-farm choice of livelihood diversified strategy are more cooperative. So to mitigate the existing challenges of livelihood strategy, the existing cooperatives to mitigate to work together to promote their common Social and economic interest. Membership in such institutions increases the social network of the household and enables them to obtain savings and credit, agricultural inputs and provides training for cooperative members. In relative terms, cooperative members have better access to intervention in off-farm and non-farm opportunities than non-members of cooperatives. In the study area, cooperative member households pursued a choice of livelihood strategy in addition to agriculture. The chi-square result revealed that members of the cooperatives in the study area had influenced the choices of livelihood strategies in the study area ($p<0.01$) (Table 6).

4.2.3.7 Educational Level of Household Head

Table 6 shows that the choice of household livelihood strategy varied across the educational status of the households, i.e., Illiterate, (48,16, 5, 2,) Grade 1-4, (13,30, 10, 4,) Grade 5-8, (2,9, 4, 3) and Grade 9-12 (0,0, 1, 1) for on-farm only, on-farm + non -farm, on-farm + off-farm and the combination of on-farm + nonfarm+ off-farm, choice of diversified livelihood strategy groups respectively. Table 6 also shows that 48 (76.20%) of those engaged in On-farm activity are illiterates. This result indicates that the households with better education pursued their income from more than one source, particularly the illiterate households who chose only on-farm livelihoods. This evidence indicates that education could equip households and individuals with better skills and knowledge to tap into other opportunities and assist them in choosing appropriate choices of diversified

livelihood strategies. Eventually, this led to the generation of additional income and the accumulation of assets. It also determines the capacity of household heads to diversify with more confidence and a better risk mitigation mechanism in the study area. In this case, education is an essential tool that helps households engage income-earning opportunities. In addition to these households, comparatively less educated are concentrated under the cluster of on-farm livelihood choices. This also indicates that households that depend only on On-farm activity spend more time on their farm than going to schools, which is why on-farm activity does not need education to operate on-farm activities on the farm. Education was statistically significant at a less than 1% probability level (Table 5).

4.2.3.8 Total Income Compositions of the sample households in ETB

The sources of income for rural households may differ from household to household across the community, depending on the farmer's situation. The sources and contribution of each source of income to improve livelihood security depend on the effort put towards extracting resources from that source. Farm households engage in multiple sources of income-generating activities that support their means of survival. This survey income composition indicates the household's annual cash income portfolios generated from each livelihood option and shapes the households' engagement in additional livelihood choices. Rural households engage in off/non-farm livelihood activities only when the income from the agricultural sector does not guarantee the means of survival or sufficient income generated that pushes them to invest in asset accumulation.

In the study area, the primary income sources for the sample households are crop sale, livestock and livestock product sale, petty trade (small business), hand craftworks, causal wage and daily labour, firewood and grass selling, local drink selling, renting donkey cart, and remittance. The most important source of income for all households by its share was the crop which accounts for (33 %), livestock (23 %) and petty trade (14 %) in order of importance (Table 6).

Even if agriculture is subjected more to risk factors, the proportion of income share it holds alone accounts for about 72%, non-farm accounts for 20%, and off-farm accounts for 8%.

Table 6: Distribution of household's cash income composition generated from the different choices of Livelihood Diversification Strategies in Birr

Cash Income composition	Income Composition
	Total (n=149)
On-farm income	
Crop	33
Livestock	23
Livestock product	16
Sub-total	**72**
Off-farm income	
Daily labour in the local area	2
Daily labour near urban	2
Wage labour in other areas	4
Firewood/grass sale	0.12
Sub-total	**8**
Non-farm income	
Petty trade	14
Handcrafts	3.2
Remittance	1.8
Local drink sales	0.24
Weaving	0.6
Spinning	0.6
Donkey cart rent	0.3
Sub-total	**20**
Total sum of cash income	742,252.7
Mean	4982

Source: Survey Results, 2016

4.3. Factors Affecting the Choices of Livelihood Strategies

In this econometric investigation, multinomial logistic regression analysis results identify determinants of the rural household's choice of livelihood strategies. Based on the test conducted to identify the occurrence of multicollinearity among the explanatory variables that may affect the parameter estimates of the regression models, there is no severe problem of multicollinearity in the survey data since all values were below the standard (i.e. VIF values) value 10 (Appendix Table 2). Accordingly, the contingency coefficient, which measures the association between various discrete variables, was computed for six variables to check the degree of association among the discrete explanatory variables. Again, there were no association problems since all CC values were below 0.72 (Appendix Table 1).

4.4. Multinomial Logistic Regression

Based on the theoretical background and literature review on related studies, a multinomial logit model was conducted to estimate hypothesised explanatory variables' effect on farmers' choice of livelihood strategies. The dependent variable is the category of farmers on the adoption of livelihood strategies, taking a value of 1 if a farm household is pursuing on-farm only (n_1=63), a value of 2 if selecting on-farm plus non-farming (n_2=55), a value of 3 if adopting on-farm with off-farm activities (n_3=20) and a value of 4 if the choice was on-farm plus non-farm and off-farm (n_4= 11). The maximum likelihood method was employed to estimate the parameter estimation of the multinomial logit model. Statistically significant variables were identified to measure their relative importance in the farmers' decision to choose livelihood strategies. The SPSS 20 was used to generate the parameter estimates. The maximum likelihood estimates are presented in Tables (8, 9 and 10). The value of the Pearson chi-square indicated the goodness of fit for the fitted model. The likelihood test ratio statistics indicated by the chi-square statistics are highly significant (sign= 0.000), suggesting the strong explanatory power of the model. The marginal effect measures the expected change in the probability of a given choice that has been made with the unit change in the explanatory variable Greene, W. (2000).

Table 7: Multinomial Logit Regression output of On-farm + Non-farm Livelihood Strategy

Variables	Coeff.	Std. Err.	Z-value	P-value	Marginal Effect
AGEHHH	-.587563	.2665678	-2.08	**0.028****	-0.06209
FAMLISIZE	-.8608345	.2.420662	-0.36	0.722	-0.0910053
SEXHH	-2.386418	3.550276	-0.67	0.501	-0.3777333
DDRATIO	3.950282	2.874085	1.37	0.69	0.4172009
EDUCLEV	.5194524	2.135384	0.24	0.808	0.054837
LANDHLDNG	.1318171	4.976573	0.03	0.979	0 .0138729
INCOM	-.0007513	.0004989	1.51	0.132	.0000794
MARKDIS	-1.201144	.5612522	-2.14	**0.032****	-0.1268662
LIVSTOCK	-.5167755	0.160053	-3.28	**0.000*****	-0.1268662
NUMBOFOXEN	-3.891488	3.984006	-0.98	0.329	-0.4109894
TRAINING	-1.731447	4.118942.	-042	0.674	-0.1338025
CREDIT	6.556108	5.803639	1.13	0.259	-0.9271436
COOPMEMB	.9100064	4.369666	0.21	0.835	0.1145074
CHEMFERTL	1.53489	4.113606	0.37	0.709	0.1271967
EXTEAGCO	-.722845	.2881884	-2.47	0.1015	0.0556943
Const.	16.85835	18.40029	0.92	0.360	

****** and ** Indicate significance at less than 1% and 5% probability levels, respectively.***

Source: Model output

Table 8: Multinomial Logit Regression output of On-farm + Off-farm Livelihood Diversification Strategy

Variables	Coeff.	Std. Err.	Z-Value	P-Value	Marginal Effect
AGEHHH	-.0185793	.1906456	-0.10	0.922	0.00321
FAMLISIZE	-1.789668	.2.499531	-0.72	0.474	-0.0104
SEXHH	-2.573847	3.640762	-0.71	0.480	-0.00231
DDRATIO	5.017172	2.900475	1.73	**0.084***	0.0280
EDUCTLVL	.4168184	2.212703	0.19	0.851	0.0219
LANDHLDNG	-45.8439	21.70381	-2.11	**0.035****	-0.0283
INCOM	.0016904	.0007365	2.30	**0.022****	0.0988
MARKDIS	.6766915	.5957605	1.14	0.256	0.0507
LIVSTOCK	.350353	1.5554798	-0.23	0.822	0.0255
NUMBOFOXEN	-7.497038	3.666712	-2.04	**0.038****	-0.0434
TRAINING	3.172385	1. 209758	2.62	**0.009*****	0.0755
CREDIT	3.686242	1.951237	1.889	**0.053***	0.0145
COOPMEMB	-.3620243	4.60845	-0.08	0.937	-0.0272
CHEMFERTL	3.6726	4.104348	0.89	0.371	0.0148
EXTAGCON	-1.16757	.3547239	-3.27	0.102	0.0924325
Const.	-12.87075	17.0275	-0.76	0.450	

******, ** and * Indicate significance at less than 1%, 5% and 10% probability levels, respectively.***

Source: Model output

Table 9: Multinomial Logit Regression output of On-farm + Off-farm + Non-farm Livelihood Diversification Strategy Choice

Variables	Coeff.	Std. Err.	Z-Value	P-Value	Marginal Effect
AGEHHH	-.5043925	.3112423	-1.62	0.105	-0.00312
FAMLISIZE	-1.331044	.2.631774	-0.51	0.613	- 0 .00883
SEXHH	-3.112114	1.408016	-2.21	**0.027****	- 0.060833
DDRATIO	6.963402	3.354151	2.08	**0.038****	.0 04667
EDUCTLVL	3.688117	2.8923	1.28	0.202	0 . 02608
LANDHLDNG	5.915954	7.933139	0.75	0..456	- 0 .04244
INCOM	.0005056	.0006224	0.81	0.417	-0.03893
MARKDIS	-.9779895	.9044159	-1.08	0.280	-0. 006
LIVSTOCK	-2.024737	1.684297	-1.20	0.229	-0.01412
NUMBOFOXEN	-7.097546	4.882145	-1.45	0.146	-0.04769
TRAINING	1.283966	4.537319	0.28	0.777	0 .01618
CREDIT	4.428324	6.179634	0.72	0.474	0.00686
COOPMEMB	-.2.571495	1.03032	2.49	**0.012****	-0.03991
CHEMFERTL	6.912913	4.691921	1.47	0.141	0.0414
EXTAGCON	-.5825044	.3987747	-1.46	0.144	0 .0589992
Const.	-6.261609	21.04182	-0.30	0.766	

Dependent Variable	Diversified Livelihood Strategy
Base Category	Agriculture
Number of Observations	149
Log-likelihood	-32.934539
LR chi^2 (42)	289.88
Pseudo R^2	0.8148
Prob > chi^2	0.0000***

****** and ** Indicate significance at less than 1% and 5% probability levels, respectively.***

Source: Model output

4.4.1 Significant Explanatory Variables

The results indicate that among 15 hypothesized explanatory variables, three, six and three variables were found to significantly influence the choice of On-farm + Non-farm, On-farm + Off-farm and On-farm + Non-farm + off-farm, respectively. The multinomial logit model result indicates that sex (SEX), land size (LANDSZ), livestock ownership (LIVSTOCK), annual cash income (INCOM), age (AGE), cooperative membership (COOPMER), Oxen ownership (OXEN), training (TRAIN), market distance (MARKDIS), the dependency ratio (DEPENRA) Credit use (CREDIT), were determining farmers choice of livelihood strategies (Table 8, 9 and 10). However, the magnitude effect of some significant variables is not similar for the three livelihood strategies. Some may be highly significant to affect the choice of a strategy and maybe insignificant for the other. Therefore, multinomial logit analysis results indicate that each type of livelihood strategy is affected by different factors and at different significance levels by the same factor (Tables 8,9 and 10). It has to be noted that the multinomial logit estimates are reported for three of the four categories of livelihood strategies choice. The first alternative (i.e. selecting on-farm only) was used as a benchmark alternative against which the choice of the other three alternatives was seen. The plausible implication and marginal effects of the significant explanatory variables on the choice of households' livelihood strategies are presented as follows:

Sex (SEX): It was found that sex had negatively and significantly affected the probability of diversifying the livelihood into on-farm+ Nonfarm+ off-farm activities at less than a 5% probability level. This result implies that female households were less likely to participate in off-farm and non-farm activities. The possible reason is that Female household heads have more home management responsibilities. On this, male household heads tend to engage in different activities, which improves their income. As observed in the study area, traditional culture leads to gender disparity, giving female-headed households less chance to participate in off-farm and non-farm activities. Women's mobility to the urban area searching for off-farm and on-farm activities is not culturally accepted, and most societies perceive it from a negative angle. Other things keep constant; the likelihood of a household diversifying into off-farm activities decreases by 6% when the household head

becomes female. This result agrees with the prior finding by Ellis (2004) and Adugna (2008).

Age (AGE): The model result also indicated that the household head's age negatively influenced the choice of on-farm and non-farm activities at less than a 5% probability level. Most of the time, livelihood options, especially off-farm and non-farm activities, are expected to be performed by younger farmers who are more active in condensing the opportunity due to better access to information, education, and training. The probability of individual households migrating to search for off-farm or/and non-farm livelihood options decreases with the increase in age due to social prestige and respect. In addition, the younger farmers hope to see a bright future with a high family income, food self-satisfaction, a large number of livestock, stable life and social respect so that they are more diverse in off-farm and/or non-farm livelihood choices than older framers. Keeping the other variables constant, a unit change in age decreased the probability of a household choice of on-farm + non-farm and a combination of on-farm, off-farm + non-farm activities by 6%, respectively. This result is similar to previous studies by Barrett *et al.* (2001); Destaw (2003); Rao *et al.* (2004); Adugna (2005), Berhanu (2007), Adugna (2008),

Livestock ownership (LIVSTOCK): As hypothesized, livestock ownership had negatively and significantly affected the choice of livelihood strategies in on-farm and non-farm activities at less than a 1% probability level. This result suggests that a household with more extensive livestock holding is less likely to diversify the livelihood strategies into on-farm and non-farm activities than those on-farm households with fewer livestock. In rural areas, land and livestock size are the two significant bases of wealth, and farm households with many livestock and extensive farmland are respected in the area community. So, a large amount of livestock owned by farm households has a negative association with the choice of livelihood strategy in the study area. This indicates that owning large livestock sizes created a better opportunity to earn more income from livestock and livestock products to fulfil necessities. Here, households engaged in the on-farm livelihood strategy get the required income and food from livestock and livestock products without being involved in another income-generating activity away from the on-farm. Nevertheless, households with fewer livestock diversify their income portfolio by participating in non-farm

and off-farm activities to supplement the income from livestock. This study is also in line with Adugna (2008) and Yishak *et al.* (2014).

Number of Ox/Oxen Owned (OXEN): As hypothesized, oxen ownership had negatively and significantly affected the choice of livelihood strategies in on-farm + off-farm activities at less than a 5% probability level. This result suggests that a household with more enormous oxen holding sizes is less likely to diversify the livelihood strategies into on-farm + off-farm activities than those on-farm households with a smaller number of oxen. In rural areas, land and oxen size are the two bases of agricultural production, and households with large amounts of oxen and extensive farmland are focused on on-farm activities. However, farm households that do not own ox may produce less agricultural production on their farm due to improper ploughing of land resources, resulting in low income.

Land Size (LANDSZ): The model result revealed that the size of cultivated land had negatively and significantly influenced the probability of choice of livelihood strategy on on-farm + off-farm activities at less than 5% probability level, respectively. The results of this study suggest that rural households with larger farm sizes are pursuing on-farm livelihoods, and households with smaller landholdings are pursuing alternatives away from off-farm and nonfarm. According to the result, sample households with smaller land sizes combine the livelihood alternatives to maximize their income earning potential and utilization. On the other hand, households that own small land, which resulted from declining land sizes under population pressure, may push rural households to engage in multiple off and/or non-farm activities to increase the sources of income for family expenditure. That means farmers have more land size and rely on crop production than non-farm and off-farm to satisfy basic needs. This study is also similar to the study by Tesfaye (2003), Mujib *et al.* (2008) and Yishak *et al.* (2014).

Total Annual Cash Income (INCOM): This variable positively influenced livelihood strategies combined with off-farm + non-farm activities at less than a 5% probability level. This result implies that households having significant cash income are more likely to diversify their livelihood strategies into non-farm activities. The possible reason is that adequate sources of income pushed the farm household to engage in additional income-generating activities for asset accumulation. Households with adequate income sources

can overcome financial constraints to engage in alternative livelihood strategies. Hence, higher income can encourage farmers to invest in non-farm activities from which family income can be generated. Depending on the model result, the influence of other factors was kept constant; the marginal effect revealed that the probability of a household diversifying into combined off-farm and non-farm activities increased by 9%, with a unit increase in the level of cash income for those farmers who have high income compared to those with less income. This finding is congruent with the study by Babatunde, Olagunju and Fakayode (2010), Isaac B. (2009), Woinishet (2010) and Yishak *et al.* (2014)

Dependency Ratio (DEPRATIO): This variable was hypothesized to positively correlate with household choice of livelihood strategies. As hypothesized, the dependency ratio significantly correlates with the household's choice of livelihood strategy On-farm + off-farm and combination on-farm, non-farm and off-farm livelihood strategy options at less than 10% and 5% probability levels. This indicates that with the increase in the dependency ratio, the ability to meet subsistence needs declines and the dependency problems make it necessary to diversify their income source. Other factors kept constant; adding one dependent person to the household member increases the probability of the household's choice falling into on-farm + off-farm and Combination of on-farm, off-farm, and non-farm livelihood strategies by 2.8% and 4.6. This result is consistent with Warren (2002) and Rao *et al.* (2004).

Distance from Market Centre (MKTDIST): Distance to the local market was hypothesized to correlate with livelihood strategies negatively. As hypothesized, it is found to have a negative and significant correlation with the probability of diversification into On-farm + non-farm at less than a 5% probability level. This result indicates that as the distance from the nearest market increases, households' tendency to diversify into On-farm and nonfarm activities decreases. The possible justification could be that households who are closer to the market centres have more access to marketing opportunities and get accurate and relevant information on time, and this helps them to take advantage of market opportunities also households near the market do not have many costs to access market incentive for diversification of livelihoods in addition on-farm. Moreover, improved market access can stimulate producing cash crops and other marketable crops and encourage participation in petty trading.

On the other hand, on-farm households are comparatively far from the market centre and less likely to diversify off-farm or/and non-farm activities. This shows that market distance increases, access to information decreases, and transportation costs increase. So this situation discourages farmers' perception of the choice of livelihood strategy. This finding agrees with Rao *et al.* (2004) and Carswell (2000).

Membership in Cooperatives (COOPER): membership in cooperatives was hypothesized to correlate with the Choice of livelihood strategies positively. As hypothesized, this variable was influenced significantly and positively to determine the choice of household livelihood strategy at less than a 5% probability level on the combination of on-farm, off-farm and nonfarm. This means that households who are members of cooperatives improve the diversification strategy of households by cooperative services like saving, credit, training and promoting access to social capital in which off/ nonfarm options are available. Nowadays, cooperatives are becoming critical and ultimate objectives of the development agenda to address the rural poorest of the poor who are marginalized due to social discrimination. The appropriate social capital promotes the potential to secure rural income sources and reduce vulnerability and shocks. Keeping the influence of other factors constant, the livelihood strategy of participation of the households in on-farm, nonfarm, and off-farm increased by 3% for those who are members of cooperatives compared to that who are not. The result is in line with that of Warren (2002), Bezemer and Lerman (2002) and Adugna (2008).

Credit Use (CREDIT): In line with prior expectations, credit use is found to have a significant positive impact on the choice of livelihood strategies of on-farm + off-farm ($p<0.10$). This positive result may be the impact of credit services. Farm households are expected to develop business plans to access and utilize loan services delivered by micro-finance institutions. On the other hand, households are expected to get training on loan management and income generation; this satiation and additional seed money obtained through credit services push households' attention towards diversifying livelihood strategic choices. This implies that the formal and informal credit facilities that avail for rural farmers are a significant asset in rural livelihoods not only to finance agricultural inputs activities and for further investments but also to protect against the loss of crucial livelihood assets

such as cattle due to seasonal food shortage, illness or death (Tesfaye, 2003). This is in agreement with that of Meser and Townsley (2003).

Training (TRAIN): this variable positively impacted the likelihood of choosing livelihood strategies on-farm + off-farm at less than a 1% probability level. This implies that farmers who participated in on-farm + off-farm training were likelier to have more livelihood strategies than those without training. This might be due to the on-farm training improved the production and productivity of the agricultural sector, which helped farm households to accumulate additional assets by participating in non-farm activities due to increase their income; on the other hand, non-agricultural training developed the entrepreneurial skills of the farmers to engage in additional income-generating activities in addition to agricultural production. Therefore, integrating agricultural training with non-farm enterprise training can help HHs manage and market their farm production more effectively.

4.5 Summary of the Qualitative Analysis

Points outlined under this part of the thesis as opportunities to diversify the livelihoods of rural households are the results of discussions with Key Informants (experts from different government offices in the district). Even though the points presented here are not exhaustive, and maybe some have no direct relation to the livelihood of individuals, they are believed to contribute in one way or another to the lives of individual households. Points identified as opportunities for diversified livelihood strategies in the study area are indicated as follows:

As stressed by the key informants, the existing government policy is an excellent opportunity to choose livelihood strategies. The government has organised community members into different groups (Cooperatives, Micro Enterprise development, Development Groups,1 to 5) to engage in livelihood activities. According to the district office, 106 youth groups in the study area have been organized and started working on construction materials like (sand and stone) preparation, selling, and other business. Click here (**https://www.youtube.com/watch?v=3DwiP2-UMvo**)

Ashley (2000), when indicating the contribution of tourism to livelihood needs and priorities, stated that tourism generally generates four types of cash income for rural

households. These are: i) regular wages for those with jobs, ii) informal earning opportunities from selling food, crafts, etc., iii) profits from ownership of a tourism enterprise, and iv) collective income the community earns. *O*ne of the study Kebles areas had tourism potential with the scenic Ajora Falls. As to the district culture and tourism office report, the area had many natural beauties developed for tourism purposes. However, only beautiful twin falls and natural forests have been identified to be developed for tourism purposes. The fall had been on function, and the youths in the area worked on it as an income source. However, this tourism attraction was not well developed and promoted for tourism.

As reported by the Key Informants, some natural resources like stone and sand exist for construction purposes. The informants considered these an additional opportunity for the residents and youth to develop and generate income. According to the same source, some youths and farmers prepared and sold the resources in Wolaita, Kambata and Hadiya Zones.

The availability of different NGOs in the district was also identified as another opportunity. According to information from the Woreda Office of Finance and Economic Development, 9 NGOs operated in different sectors. For instance, 5 implemented projects directly related to IGA and livelihood security.

The discussants of the FGDs said that there were many challenges to education and schooling in the District (Woreda), such as high youth unemployment, limited economic and social alternatives for women and increased youth migration to the cities looking for better jobs. They found that strategic and policy support for women and youth was very low. Little or no capital was made available for the youth to create employment opportunities in agriculture, irrigation, petty trading, etc.

In the study area, the principal or subsistence food crops produced and sold in the Woreda were ginger, maize, and fruit (Mango and Avocado). However, the disease severely damaged ginger production during the study period and severely affected the production and productivity of maize. Areka Research Center, the Universities, Government and NGOs were not taking adequate and appropriate measures to address the problems to

tackle those diseases. On the other hand, all stakeholders did not assist in identifying the problem to tackle the diseases; all intervening organizations did not work in an integrated way to solve the livelihood problems of the community.

In the study area, 65 cooperatives are in different business running processes. However, there was management, working capital and market problem for all cooperatives. According to Boloso Sore Woreda Cooperative's response from 65 cooperatives, no one shares their dividends for their year.

Horticulture crops, mainly mango, avocado, and banana, highly contribute to the Ethiopian economy. According to CSA (2013), during the cropping season, banana, Avocado and mangoes contribute to about 14.21% and 59.5 % of the land allocated for fruit production and holds 63.3% and 14.55% of quintals of fruits produced in the country, respectively. SNNPR shares 68% and 33% of the national production of banana and mango, respectively (CSA, 2014) and 90-95% of production by smallholders is marketed. Wolaita Zone is one of the potential fruit-producing zones in the region. According to the Wolaita zone Agriculture office, in 2009/10, the total production of mango, Avocado, the banana was 159,580, 134,563 and 90,123 quintals. Farmer’s livelihood is highly supplemented by the income from their mango, Avocado and banana trees. Boloso Sore Woreda is the leading mango, Avocado and banana producer and shares 40% of the Wolaita fruit production. The livelihood of most of these farmers is highly supplemented by the sale of mango and banana, which shares an average of 10% of the household income. Women usually participate in the lower node of mango and banana by selling low-quality fruits to the local market at a lower price. The contribution of this sector is far below its potential due to seasonality, perishable nature of the products, lack of value addition, lack of technical and soft skills in the value chain, lack of postharvest processing technologies and underdeveloped markets. AOC (2015) studies in the area indicate that the pre and postharvest loss are estimated at around 20% to 25%, and farmers receive two or three times less than what it is worth in the destination market. The fertiliser price increased and became difficult for the farmers to use; the land was not providing production without chemical fertilizer.

The participants were aware that there was high irrigation potential in the area. However, no such initiatives or schemes were being undertaken, and also for livestock production, there was not enough grazing land, and forage and fodder shortage was severe.

Financial institutions do not provide financial services to needy individuals due to the collateral problem, and all Financial institutions set the collateral policy for loan provision. This policy rejected poor people from taking a loan from Micro Finance Institutions that have a demand for credit.

CHAPTER V

5. CONCLUSION AND RECOMMENDATIONS

5. CONCLUSION AND RECOMMENDATIONS

5.1. Summary

The study's objective was realized by conducting a household survey for 149 randomly selected households in the study area. A multi-stage stratified sampling technique was used for selecting the sample households. Both descriptive and Multinomial Logit Regression (MLR) econometrics analyses were employed. Household livelihood asset variables for different livelihood strategy groups and the strategy across wealth status were better described in descriptive analysis. At the same time, a multinomial logit model was applied to investigate the determinants of diversified likelihood choice of livelihood strategies selected by rural household heads. The descriptive statistics result showed a significant mean difference in age composition, Sex, education level, family size, dependency ratio, land holding, livestock ownership, Oxen number, Cooperative membership, Income, Family Size, Market Distance and Chemical fertilizer of households. Livelihood strategies by wealth status results show that most poor, medium and better-off household groups choose On-farm + non-farm, On-farm off-farm, On-farm off-farm and On-farm + off-farm + non-farm livelihood strategies.

The multinomial logistic regression model revealed that out of the 15 hypothesized variables in the model, 11 were found to significantly influence households' adoption of alternative livelihood strategies at 1%, 5%, and 10% probability levels. These significant variables include; sex, age, dependency ratio, land size, livestock holding, Oxen number, market distance, membership in cooperatives, credit use, participation in training, and annual cash income.

In pursuit of this, the model result indicated that the variables, cooperative membership, credit use, training, annual cash income, and Dependency ratio influenced positively and significantly the household's choice of livelihood strategies into on-farm + non-farm, on-farm+ off-farm, and combination of on-farm + non-farm+ off-farm livelihood choice whereas, sex, age, land size, livestock holding, No of oxen and market distance, influenced negatively and significantly the choices of diversified livelihood strategies of

sample households into on-farm + non-farm, on-farm off-farm, and combination of on-farm + non-farm+ off-farm livelihood choice activities.

Accordingly, age (<5%), Market distance (<5%), and Livestock ownership (<1%) influenced the choices of diversified livelihood strategies of the sample households in on-farm + non-farm activities negatively, whereas training (<1%), Annual Income (<5%), the Dependency ratio (<10%) Credit use (<10%), positively the choices of livelihood strategies of the sample households into on-farm + off-farm activities. Furthermore, land holding (<5%), Number of oxen owned (<5%) influenced the choices of livelihood strategies of sample households in on-farm + off-farm activities negatively. In addition, sex (<5%) influenced the choices of livelihood strategies of sample households into on-farm + nonfarm, off-farm activities negatively. In contrast, cooperative membership (<5%) and the Dependency ratio (<5%) influenced the choices of livelihood strategies of the sample households into on-farm + nonfarm, off-farm activities positively.

5.2. Conclusion

This study looked into the livelihood diversification strategies of rural households and factors that determine livelihood strategies in Boloso Sore Woreda at the household level. In the study, the primary livelihood activities available to rural households are on-farm alone, on-farm + nonfarm, on-farm + off-farm, and a combination of on-farm, off-farm, and non-farm. In the study area, on-farm is the dominant economic activity and primary livelihood source for rural households. However, agricultural production has failed due to small land size, high population growth crops, and regular disease drought. As a result, it has forced people to look for employment alternatives other than agriculture.

The findings showed that a substantial proportion of the rural households were engaged in diversified livelihood strategies away from “purely” crop and livestock production towards non-farm and off-farm activities undertaken to broaden and generate additional income for survival and livelihood improvement. From the research finding, it is essential to understand that the agricultural sector alone will not ensure better diversification of the rural livelihood strategies, such as improving livelihood strategies, food security and reducing poverty in the area. However, diversified livelihood strategies are gaining/playing

a prominent role in rural households' income and food security. Therefore, in Ethiopia, policymakers give almost total attention to the agricultural sector for the rural economy.

In the study area development, extension workers and Woreda executives fully committed to lone collection and fertilizer distribution activities in fragmented small land rather than capacity building and training for rural farmers related to on-farm and non/off-farm livelihood strategy. Nevertheless, there is growing evidence that the rural sector is much more than farming. Low-resource endowments were identified as the main characteristics of poor wealth groups and indicated that the meagre resource available in their area could not be developed and used to generate sufficient livelihood outcomes. To overcome the situation, most poor households depend on other livelihood options and agriculture, which is not worth improving their livelihood. Further, the survey results also showed that the rural households diversified livelihood strategies in addition to agriculture.

This study indicated that household capitals are the primary basis for determining the rural household's capacity to choose livelihood strategy options. The existence of similarities and differences in the resource endowments of households categorized under the poor, medium or better-off wealth category indicates that the capacity of rural households to choose and/or combine the available livelihood options depends entirely on the existing potential household capital. In this regard, rural households with poor wealth status possess low resource endowments that could not supplement them to generate sufficient household income to achieve livelihood goals. On the other hand, households categorized under the better-off wealth category possess better resource endowments worthy of investing. In addition, many poor households in the study diversify their livelihoods in more fragmented activities of diversification that can maximize their potential to extract sufficient income to overcome the crisis in the study area.

The findings of this particular study pointed out that poor households are characterized by small and fragmented land holdings, minimal livestock holdings, and low income. In other words, the poor households are tagged for their low resource endowments, minimal access to available resources, and pursuing minor incentive livelihood alternatives (off-farm and non-farm) that are not worthy. However, the opposite is true for better-off households. Above all, primary household resources; land size, livestock holding, number

of oxen, income level, age, sex, training, number of dependent families, market proximity, exposure to social institutions like cooperatives and using credit are the major factors that determine the households' choices of diversified livelihood strategies in off-farm and non-farm activities.

5.3. Recommendations

Based on the study's findings, the following policy recommendations are possible areas of intervention in which the Government, NGOs, policymakers and development practitioners might suggest possible ways of sustainable livelihood strategy options that might help the rural community adopt appropriate alternatives to livelihood strategies in the study area.

- The negative and significant influence of the variable sex on the household choice of livelihood strategies considers government and other responsible bodies to design necessary strategies to create awareness among the community to participate with men in all development activities.
- Education's important livelihood strategies suggest giving due attention to promoting farmers' education by strengthening and establishing formal and informal education, developing farmers' training centres, and expanding technical and vocational schools.
- The significant and positive effect of age on adopting non-farm activities calls for policy instruments to build the capacity of rural farm households in non-farm activities to enhance their skill to exploit the opportunity sustainably.
- The significant role of livestock ownership in livelihood security suggests designing a development strategy for livestock sectors by improving livestock breeds, veterinary services, forage development, marketing, access to credit, and overall livestock production management to improve rural household welfare and food security status in particular.
- The strong positive association between total annual cash income on livelihood strategies of the household calls for policy measures to pave the way to solving

financial problems by developing and strengthening financial institutions, creating credit access, and promoting better income-generating options.

- The Farmers Training Center (FTC) establishment and equipping them with all training and demonstration materials should be significant agendas of the Government and relevant stakeholders' development intervention to improve the rural farmers' capacity. Building the capacity of rural households in the area of entrepreneurship, financial literacy, income-generating activities, rural business plan development, asset management, and other integrated areas of agricultural and non-agricultural pieces of training are essential dimensions that can improve the skills and knowledge of the rural poor to utilize the available opportunities efficiently. Creating improved access to information and other necessary services like affordable credit for the rural households in the study area are the main policy directions that consider government and other responsible bodies to build the capacity of rural households through education and training to participate actively in development activities and leadership.

- Policymakers and development professionals and expertise should design the policy interventions in the context of supporting more vulnerable parts of the community by opening the opportunity for improved access to alternative means of income-generating activities that can support the rural poor who are suffering from income poverty to fulfil the basic needs of the dependents family members. Click here (**https://www.youtube.com/watch?v=05WRn1MkhPM**)

- Land size's negative and significant impact on livelihood strategies suggests that concerned bodies develop appropriate strategies and policies, especially for land resource-poor farmers. People who own no or smaller-sized farmland suffered more from income poverty and food insecurity crises. In this regard, all responsible bodies of policymakers and development practitioners develop appropriate strategies and policies regarding landless and land resource-poor farmers who struggle for food security by pursuing livelihood diversification strategies. Developing policies and strategies that can support the rural poor to possess very small and fragmented farmland by improving the living condition of the poor by

promoting and creating a positive environment for the emerging non-farm livelihood alternatives and building farmers' capacity in the area of agricultural intensification can improve the production and productivity. Even though household with large land size depends on agricultural activities, agricultural and other concerned offices need to pay attention to the promotion of nonfarm and off-farm activities to increase their return through income diversification and to decrease the vulnerability to shock, since sometimes land size may not be the only guaranty to obtain high return as of fertility. Moreover, almost all agricultural activity is highly vulnerable to natural disasters.

- The fertility of the soil in question and the price of fertilizer was increasing. Therefore, it had become difficult for poor farmers to use it. Therefore, policymakers and research organizations should research the effect of using a highly chemical fertilizer frequently two or three times a year on the same land, including in the policy and promotion of organic fertilizer (compost) is better for land fertility and cost-effectiveness for poor farmers.

- The dependency ratio was found to positively influence the choice of livelihood strategies in rural farm households. As a result, it is recommended that government, NGOs, and private investors work on job creation activities for youth, and community mobilization must conduct accordingly.

- The analysis indicates that the study area family size is one of the main problems hampering diversified livelihood strategies. It significantly and positively affected the diversified livelihood strategies opportunity in the study area. Therefore, the promotion and provision of family planning to reduce household size should improve household livelihood.

- Marketing is one of the significant components of livelihood objectives in agricultural and non-agricultural production. Farmers need to have market access to sell their output and agricultural input to adapt and choose other livelihood activities. To ensure market access for farmers, the government must encourage local distribution centres for agricultural inputs like chemicals, fertilizers, improved seeds, farm tools, and other agricultural inputs to improve the value chain and

market accessibility. Improved access to the nearest market, creating market linkages, and appropriate market policies that protect the rural poor from the crisis of fluctuating markets were important ways to solve the acute market problem in the study area. Linking the rural poor producer farmer to the market institutions can improve agricultural sector production and productivity, and improved physical access to the market creates off-farm or non-farm employment opportunities for rural poor farm households.

- In the study area, cooperative faces many challenges in management, working capital and market linkage problem. So Government NGOs should work on capacity building, injecting working capital, and facilitating loans. In addition, policy measures should capacitate the existing cooperative organizations financially and technically to provide a wide range of cooperative services and link the poor rural households to the improved cooperative organizations.

- Enhancing rural credit service to subsistence farmers in the district needs to be considered one of the primary areas of intervention. Rural credit services can help farmers solve the capital problem in buying farm oxen, modern farm inputs, use for trade, further enhancing technologies, etc. Investment is a direct result and indicator of the accumulation of the power of financial capital earned through income-generating activities or accessed from financial institutions. Therefore, the capacity of financial institutions should be improved to serve the rural poor better. Likewise, the capacity of farm households needs to be improved to access the service delivered by those credit institutions. In this regard, the accumulation of financial capital through improving access to credit services, strengthening the capacity of existing financial institutions, and promoting the awareness of the community on income-generating alternatives were needed to solve financial problems.

- FGDs showed that without collateral, no one access loans from Micro Finance Institutions. In this case, poor people had no access to any loan from Micro Finance institutions. However, the main objective of establishing Micro Finance Institutions was to support the poor with no assets to provide collateral for lone informal banks. So Microfinance Finance Institutions should review their collateral policy to serve

poor people who are no assets for collateral to take the loan and address the objective of Micro finances formation for poverty reduction. Moreover, Government and policymakers should give special consideration to poor people in facilitating the loan.

- In the study area, the disease affects the primary food security crops, like ginger and Maize. Ginger production was severely damaged by disease, and also production and productivity of maize were affected severely by disease. To tackle those diseases, the Research Centre, Universities, Govt. and NGOs should be made flat form jointly to take action to solve the problem rather than working independently.

- The study area with high youth unemployment, limited economic and social alternatives, and increased youth migration to the cities looking for better jobs. Hence, Government and private investors have to intervene in the industrial and manufacturing sector to consume this massive unemployment

- Boloso Sore woreda is the leading mango, Avocado and banana producer, but the farmer receives two or three times less than what it is worth in the destination market. Hence, Government and private investors have to intervene in the Value Addition of fruit production.

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7.APPENDICES

7. APPENDICES

7.1 Appendix I: List of Tables in the Appendices

Appendix Table 1: Contingency Coefficient (CC) for Discrete Variables

Variable	SEX	EDUCLEV	CHEMFERT	COMEMB	CREDIT	TRAIN
SEX	1					
EDUCLEV	0.32	1				
CHEMFERT	0.231	0.127	1			
COMEMB	0.124	0.052	0.146	1		
CREDIT	0.162	0.170	0.098	0.108	1	
TRAIN	0.156	0.065	0.091	0.065	0.084	1

Source: model output

Appendix Table 2: Variance Inflation Factor (VIF) of Continuous Variables

Variable	Tolerance	VIF
AGE	0.787	1.271
FAMLSZE	0.748	1.337
LAND	0.823	1.215
LIVSTOCK	0.816	1.225
OXEN	0.726	1.378
EXTN	0.864	1.158
MRKTDST	0.783	1.277
INCOME	0.895	1.118
DEPRTIO	0.864	1.158

Source: model output

Appendix Table 3: Wealth Ranking Criteria

Asset Owned	Wealth Category		
	Better-off	**Medium**	**Poor**
Number of Oxen	≥2	2	0 – 1
Number of Cows	≥2	1- 2	0
Farm Land size	>2ha	0.75 - 1.5ha	Up to 0.75 ha
House type			
Annual production (Major Crops)	>30qt	5 – 15 qt	<5qt
Farm Land Management	-Proper -Rent in additional land	-Good -some times, rent in additional land	-Poor -rent out his own

Source: Community wealth ranking exercise done by community representatives, (2016).

Appendix Table 4: Conversion factors used to calculate Adult Equivalent (AE)

Age	Male	Female
< 10	0.60	0.60
10 -13	0.90	0.80
14 – 16	1.00	0.75
17 – 50	1.00	0.75
>50	1.00	0.75

Source: Storck et al., (1991)

Appendix Table 5: Conversion factors estimate Tropical Livestock Unit (TLU)

Livestock Type	TLU	Livestock Type	TLU
Calf	0.25	Ox and Cow	1.00
Weaned calf	0.34	Donkey (young)	0.35
Heifer	0.75	Donkey (adult)	0.70
Sheep/ Goat (young)	0.06	Horse and Mule	1.10
Sheep/ Goat (adult)	0.13	Chicken	0.013

Source: Storck et al., (1999)

7.2 Appendix II: Interview Schedule

LIVELIHOOD DIVERSIFICATION STRATEGIES BY FARM HOUSEHOLDS IN SOUTHERN ETHIOPIA

Serial No: ___

General Instruction for the Enumerators

- Make a brief introduction to each interviewer before starting the interview, get introduced to the interviewer, (locally greet them) get his/her name; tell them yours, the institution you work for, and clarify the purpose and objective of the study.
- Please ask each question clearly and patiently until the interviewer understands (gets your point).
- Please fill up the Interview Schedule according to the farmers' reply (do not put your own opinion).
- Please do not try to use technical terms while discussing with farmers, and do not forget to record the local unit.
- During the process, the answer of each respondent both in the space provided and encircled in the choose
- Answering more than one is possible when it is necessary.

- Identification Number (Code) _____
- Name of the Village (Keble) _____
- Name of the Enumerator_____
- Name of the Village_____
- Date of Interview_____Signature _____

I. Demographic Factors

1. General Background of respondent

1.1. Name of the Village (Kebele) Administration: _____

1.2. Name of the Respondent_____

1.3. Sex of the Household head 1) Male 2) Female

1.4. Age of the Household Head (in Year) _____

1.5. Education level of Household head 1) Illiterate 2) Grade 1-4 3) Grade 5-8 4) Grade 9 12

1.6. Marital Status of the HHH 1) Single 2) Married 3) Widowed 4) Divorced

1.7. Household/Family Size Male: _____ Female: _____ Total: _____

1.8. Health status of the Household Head _____

_____

1.9 Occupation of household head: 1. On-farm only 2. trading 3) hand archive 4) Salary wage employee 5) other specify _____

1.10 Household members' Characteristics

Give the following information concerning members of your family

S. No.	Name of the HH members	Sex Code: Female.0 Male.....1	Age (Year)	Marital Status Code: Married.....1 Divorced....2 Widow/er....3 Single.....4	Relationship to HHH Code: Husband .....1 Wife.....2 Son.....3 Daughter.....4 Grand Father.....5 Grandmother.....6 Relative.....7 Other.....8	Education Level Code: Illiterate .....1 Grade 1-4 .....2 Grade 5-8.....3 Grade 9-12.....4	Main Occupation (activity) Code: No occupation...0 Agriculture..1 Daily labourer.2 Schooling.....3 Trading.....4 Handcrafts.....5 Others.....6	Health Status Code: Healthy....1 Unhealthy.2	Dependency Ratio Code: Dependent....0 ndependent..1
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									

1.11. In which wealth category does your household fall concerning other households in the area?

1) Resource-Poor 2) Resource Medium 3) Resource Better off

2. Livelihood Strategies

2.1 What is the household's primary choice of diversified livelihood strategies?

1) On-farm alone 2) On-farm + Nonfarm 3) On-farm + Off-farm 4) On-farm + Nonfarm + Off-farm

2.2. Is there anybody, Govt. a body or an organization that helps you to choose existing livelihood strategies? 0) No 1) Yes

2.3. If your answer is “Yes”, can you tell the name of those who help you in your choice of Livelihood Diversification? 1) My family 2) My wife 3) Development Agent 4) NGOs 5) Govt. Executive 6. Cooperative 7. Microfinance

2.4 How long have you implemented the existing Diversified livelihood strategies? Year _____ Month _____

2.5. With whom did you implement the strategy?

1) On my own 2) With my family 3) With employees 4) Others specify_____

2.6. What are the opportunities to implement diversified livelihood strategies? (Multiple answers possible) 1) capacity building by training 2) Financial Capital 3) Natural capital 4) Different opportunities for trading 5) Better market linkage 6. Wage and Labor 7) Other Specify

2.7. What challenges do you face in implementing existing diversified livelihood strategies? (Multiple answers possible) 1) Limitation of technical support and 2) Shortage of training 3) Lack of capital 4) Shortage of labour 5) Weakness of market linkage 6) Other Specify

II. Institutional Factor

3.1 Extension Contact

3.1.1 Is there any extension Development Agent in your Villages (Kebeles)? ____

1) Yes 2) No 3) I do not know

3.1.2. Have you been visited by the extension agent in the past year?

0) No 1) Yes

3.1.3 How many times were visited by the extension agent in the past year? _____

3.1.4 What was the purpose of these visits ____ (Multiple answers are possible).

1) To advise on crop production 2) To advise on animal production

3) To advise on soil water and conservation 4) To collect taxes

5) To collect other debts 6) Other (specify) _____

3.2. Training

3.2.1.Did you participate in any training during the year 2008? 0) No 1)Yes

3.2.2.Your answer to question 3.2.1 is yes what type of training you participated in?

1. Agricultural training 2. Entrepreneurship training 3. Technical capacity-building training

3.2.3.How do you evaluate the training you trained supported on diversified livelihood strategies? 1. After training, I diversified livelihood strategies 2 practical activities did not support the training and did not understand the training and did not gain anything 3. Poor

3.2.4.After the train, did you receive any business plan and guidance to start any business? 0) No 1)Yes

3.3. Market Distance

3.3.1 Did you sell your crop during the year 2008? 0) No 1)Yes

3.3.2. How many KM from your home to Market _____?

3.3.3. Where did you sell these crops? 1) At farm gate 2) At local market 3) At district market 4) Others (*Specify*) _____

3.3.4 How far do you walk from your home to sell your crop (*in hours*)?_____

3.3.5 Did you sell your animal and animal products during 2008? 0) No 1) Yes

3.3.6 Where did you sell these animals/animal products? 1) At Farm gate 2) At local Market 3) At district market 4) Others (*Specify*) _____

3.3.7 How far do you walk from home to sell your animal/animal products (*in an hour*)? _____

3.3.8 What distance do you travel to get on all-weather roads (*in hours*)? _____

III. Socio Economic Factor

4.1. Cooperative Membership

4.1.1. Are there multipurpose cooperatives in your Kebele? 0) No 1) Yes

4.1.2. If the answer is 'Yes" to question 4.1.1, Are you a member of these cooperatives? 0) No 1) Yes

4.1.3. If 'Yes', what types of services are provided for you? _____

4.1.4. Is any family members member of these cooperatives? 0) No 1)Yes.

4.1.5. If 'No', why? *Specify*_____

4.2. Land Size and farm character

4.2.1. Do you have a plot of land? 0. No 1. Yes

4.2.2. If your answer to question 4.2.1 is yes, how did you get the land? 1. Government redistribution 2. Share from parents 3. Relative 4. Inheritance 5. Contract

4.2.3. What is the total land you own? 1) 0.128 ha (1/2 timad) 2) 0.25 ha (1 timad) 3) 0.5 ha (2 timad) 4) 0.75 ha(3timad) 4 1ha(4timad) 5) 1.5ha (6timad) 6) 2ha (8timad) 7) 2ha (8timad)

4.2.4. What is the total of rented land you own? 1) 0.128 ha (1/2 timad) 2) 0.25 ha (1 timad) 3) 0.5 ha (2 timad) 4) 0.75 ha(3 timad) 4 1ha(4 timad) 5) 1.5ha (6 timad) 6) 2ha

(8 timad) 7) 2ha (8 timad)

4.2.5. Indicate land holding of the family (in the year 2008 E.C)

Land allocation	**Land size *(in Timad)***	**Own cultivated**	**Rented out**	**Shared out**
Rainfed				
Irrigated				
Total land				

4.2 6. Additional land (if any) rented in/ shared in/ in year (2008 E.C)

Land allocation	**Land size (*in Timad)***	**Rented in**	**Shared in**
Rainfed			
Irrigated			
Total land			

4.2.7. How was the trend of landholding during the last ten years? 1) Increasing 2) Decreasing 3) Unchanged

4.2.8. If the answer to the above question is decreasing, why? 1) Transfer to my children 2) Land redistribution 3) Government distributed for others 4). Specify others_____

4.2.9 How is the fertility status of your land? 1) Very Good 2) Good 3) Medium 4) Poor 5) Very poor

4.2.10. How was your land-use system by the year 2008? (in Timad)

1) Land for crop production_____ 2) Land for fruit & vegetable production _____

3) Land for forest (tree) production_____ 4) Pasture land _____

5) Other *(Specify)* _____

4.2.11. Is 2008 year production from your farm sufficient to feed the family? 0. No 1. yes

4.2.12. If your answer to the above question No 4.10 is No, how many months is the production support? 1. 2 months 2. 3-4 months 3. 5-6 months 4. 7-9 months 5. 10-12 months

4.2.13 If you answer the above question No 4.2.12, the production supports less than 10-12 the remaining months from where you support your family?

4. 3 Chemical Fertilizer

4.3.1. Did you use inorganic chemical fertilizer (DAP, UREA, etc.) last year? 0) No 1) Yes

4.3.2. If 'Yes', for which crop(s)? _____ and the quantity in kg_____

4.3.3. If 'No', why? 1) Lack of knowhow 2) economic problem 3) my land was not sufficient

4.3.4. Is any disease and pest occurred to the crop during the last three years? 0) No 1) Yes

4.3.5. If yes What type of crop attacked by disease and pest (*specify*)_____.

4.3.6. Has Govt and other bodies supported you to use pesticides and controlling crop disease last year? 1) Yes 2) No

4.3.7. If 'No', why? _____

4.4. No of Oxen

4.4.1. Do you have plough oxen? 0) No 1) Yes

4.4.2. If your answer is "Yes", how many Ox you have?_____

4.4.3. If your answer to the question is no way, you do not have as a farmer?

1) I do not have money to buy 2) Livestock disease problem 3) my Land is Small size no need for an ox 4) My landholding is not convenient for ox plough 5) Others specify

4.4.4. If you have no ox for plough, can you cultivate your land?_____

4.5. Livestock ownership

4.5.1. Do you have livestock? 0) No 1. Yes

4.5.2. If your answer to the above question is yes, please complete the following table

S. No.	Type	Number	Estimated Price of one	S. No.	Type	Number	Estimated Price of one
1	Cow			6	Goat		
2	Heifers			7	Donkey		
3	Bulls			8	Poultry		
4	Calves			9	Beehives		
5	Sheep			10	Others		

4.6. Credit Service (Saving and Credit)

4.6.1. Is there a Savings / Credit service in the area? 0) No 1) Yes

4.6.2. Did you get credit during the last two production years? 0) No 1) Yes

4.6.3. If 'Yes', who provided you? (Multiple answers are possible)

1) Cooperative Bank 2) Bureau of Agriculture 3) Microfinance Institutions 4) NGO

5) Local money lender 6) Others *(Specify*) _____

4.6.4. For what development activities did you use the credit during the year? (*Specify)* __

_____

4.6.5. If you have not used credit so far, what are/were the reasons? _____

_____

4.6.6. Have you or your family had regular savings? 0) No 1)Yes

4.6.7. If 'No', why? _____

4.7. Household Income

4.7.1. What is the main income source of the household? (Multiple answers are possible)

1) Crop production 2) Livestock rearing 3) Crop and livestock production

4) Merchant/trade 5) Daily labor 6) Handicraft 7) Others (*specify)* _____

4.7.2. Do you have your own residential house? 1) Yes 2) No

4.7.3 If ''Yes', what type of house does the family have? 1) Mud walled and grass-roofed

2) Grass-walled and grass-roofed 3) Mud-walled and galvanized iron sheet roofing

4) Other (*Specify)* _____

4.7.4. List out other types of resources that you have (farm machinery, building, car, etc.)

S. No.	Resources	Number	Estimated Price of all	Remark
1				
2				
3				
4				

- **Income from On-farm activities**

Crop produced and income obtained from crop sale

4.7.5. Was your last year's crop produce enough to cover the annual food requirements of your household? 0) No 1) Yes

4.7.6. How do you rate your last year's crop yield? 1) High 2) Medium 3) Low 4) Similar to the previous years

4.7.7. If the production was high, what do you think is the reason? _____

4.7.8. If the production was low, what do you think is the reason? _____

4.7.9. Indicate the types of crops you produced and their utilization in the year 2008 E.C as follows

Types of Crop	**Area Planted *(Timad)***	**Total Production *(Qt)***	**Total consumed at home**		**Amount Sold**	
			Amount *(Qt)*	**Value in Birr**	**Quantity *(Qt)***	**Value *(Birr)***
Maize						
Wheat						
Barley						
Teff						
Haricot bean						
Potato						
Fruits						
Taro						
Ginger						
Dbulbul Dinich						

Vegetables						
Enset						
Fruits						
Other						
Total						

Income from Tree selling

4.7.10. Do you have trees on your land? 0) Yes 1) No

4.7.11. Indicate income you obtained in the year 2008 E.C from the sale of these trees (*in Birr*)_____

Income from livestock and livestock products sold

4.7.12. Indicate types and number of livestock and livestock products sold and consumed by the family in the year 2008 E.C

S. No.	Types of livestock and its Product	Amount Sold		Amount used for family Consumption	
		Number	Value *(Birr)*	Number	Value *(Birr)*
1	Cow				
2	Oxen				
3	Heifers				
4	Bulls				
5	Calves				
6	Sheep				
7	Goat				
8	Horse				
9	Donkey				
10	Poultry				
11	Eggs				
12	Milk (*in Liter)*				
13	Skin and hide				
14	Butter (*in kg)*				
15	Honey (*in kg)*				
16	Other (*if any)*				

- **Income from Off-farm activities**

4.7.13. Have you or any of your household members participated in activities apart from agricultural production? 0) No 1) Yes

4.7.14. If 'Yes, why you started participating in such non-agricultural activities?

_____

Income from the sale of the labour force

4.7.15. Did any one of the family members/participate in daily labour in the last year?

0) No 1) Yes

4.7.16. If 'Yes', who participated?_____

4.7.17. What type of work was it? _____

4.7.18. What was your total earning from this activity in the last year (*in Birr)*_____

4.7.19. If any one of you did not participate, why?

1) Agriculture provides sufficient income for the family

2) No such chances in the area

3) No extra labour force to participate in such activities

4) Other (S*pecify*) _____

Income from the sale of the Labor force (Farm wage)

4.7.20. Did any one of the family members/participate in daily labour farm wage last year?

1) Yes 2) No

4.7.21. What was your total earning from this activity in the last year (*in Birr)* _____

4.7.22. If any one of you did not participate, why?

1) Agri. is providing sufficient income for the family 2) No such chances in the area

3) No extra labor force to participate on such activities 4) Others (S*pecify*) _____

Income from sales of environmental gatherings (grass, firewood, charcoal, etc.)

4.7.23. Did you or your family members participate in the grass, firewood, charcoal, etc., selling in the last year? 0) No 1) Yes

4.7.24. What was your total income from this activity in the last year *(in Birr)* _____

4.7.25. If you or your family member earned **off-farm** income, indicate the type of job and the amount of income earned during the last production year.

S. No.	Types of job	Amount earned during the 2008 Year in Birr
1	Daily Laborer in the local area	
2	Daily Laborer near urban	
3	Wage labour in other areas	
4	Firewood, Grass sale, Charcoal	
5	Wage labour in other areas	

- **Income from Non-farm activities**

4.7.26. Do your family receive **On-farm** income?

0) No 1) Yes

Income obtained from Trading

4.7.27. Did you/your family member participate in trading last year? 0) No 1) Yes

4.7.28.If 'Yes', who participated? _____

4.7.29. What was your trading? _____

4.7.30. What was your total income from trading in the last year *(in Birr)* _____

4.7.31. If 'No', why did you not participate? *(Multiple answers are possible)*

1) Agriculture provides sufficient income for my family

2) No such opportunity in the area

3) No information/knowledge

4) No person to do so

5) No sufficient capital to do so

6)Other *(Specify)*_____

Income from providing transportation Donkey and horse cart

4.7.32. Did any one of the family participate in this activity? 0) No 1) Yes

4.7.33. What was your total earning from this activity in the last year (*in Birr)* _____

Income from selling local food and/or drink

4.7.34. Did any family members participate in selling local food and /or drink last year? 0) No 1) Yes

4.7.35. What was your total income from this activity (*in Birr*)? _____

Income from Remittances

4.7.36. Did you or your family get a remittance or money as a gift last year? 0) No 1) Yes

4.7.37. Who/where was the source of this money? _____

4.7.38. Was it regularly every month? 0) sometimes 1) monthly

4.7.39. How much money did you get last year (*in Birr*)? _____

4.7.40. On-farm activities Income summary in 2008

S. No.	Types of Income Sources	Amount earned during the 2008 Year in Birr
1	Petty tread	
2	Handcraft	
3	Local drink and food sales	
4	Waving	
5	Spinning	
6	Donkey Cart rent	
7	Remittance	

Other Income Sources (*if any)*

4.7.41. If the family uses other income sources in the last year, describe them._____

4.7.42. Are you still interested in participating in such activities different from agriculture?

0) Yes 1) No

4.7.43. Do you think there are enough opportunities in the area to participate in activities different from agriculture for your family? 0) Yes 1) No

4.7.44. If 'Yes', what are these opportunities? _____

4.7.45. If you have not participated in activities different from agriculture, what is your reason?

1) Agri. is sufficient for the family 2) Lack of information/ knowledge

3) no other alternative in area 4) No enough capital to diversify activities

5) Others (*Specify)* _____

7.3 Appendix III: Checklist for the Key informants' Interview

1 What do you think are the dominant livelihood strategies of the area comparing On-farm, Off-farm and On-farm?

2. What is the opportunity for Livelihood strategies in addition to on-farm Activities?

3. How effective are the livelihood strategies in asset creation, asset building and asset protection?

4. How significant is the income from these strategies compared to agricultural sources of income?

5. What are the major vulnerability factors affecting this village and the livelihoods of households?

6. The role of nonfarm activities in reducing such sources of vulnerability

7. How do the alternative livelihoods strategies contribute to improved livelihood outcomes E.g. Cash, food, sustainability?

8. Who is most vulnerable and resilient (FHHs or MHHs)? How?

9. What is the trend of HH food insecurity?

10. The location and sources of credit and saving (describing credit arrangements and repayment methods, timeliness concerning the agricultural calendar, sources of remittances, regularity and frequency)

11. Are there any opportunities to leave your farm and look for off-farm and nonfarm activities?

12. Can institutional support facilitate your transition to alternative livelihood activities? Mention them, and how? What supports?

13. What are the challenges regarding On-farm, Off-farm and non-farm in the area?

14. What are the opportunity and challenges of Cooperative Credit to the stakeholders?

7.4 Appendix IV: Checklist for Focus Group Discussion

1. What do you think are the dominant livelihood strategies of the farmers in the area?

2. What is the trend of nonfarm and off-farm activities in the area?

3. What do you think is the trend of production in the District (Woreda) especially?

4. Who engaged (landless, poor, women, and youth) in Non-agricultural income earning/Off-farm? Why?

5. What are the livelihood strategies of most women-headed households? Why?

6. What are the challenges regarding On-farm, Off-farm and Non-farm in the area?

7. What is the challenge and opportunity of Cooperative and credit access?

8. ETHIOPIA – KEY TECHNICAL TERMS

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This chapter includes a list of Key terms generally used by Ethiopians practically. These Key terms will help us know the actual meaning of the essential words. The words indicate agro-ecological categories of land, agro-climatic seasons of the year, Informal Institutions, public Administrative Units like districts and Villages etc. The Ethiopian researchers have also used their concepts in the Thesis research documents. That is why; we have prepared a list of key terms that will make you understand while going through this document.

Belg – Long Rainy Season starts from February to June every year

Birr – Ethiopian Currency

Dega – Highland altitude

Development Agent is disseminating the new technology and innovations to the model farmer and fellow Village farmers. There are many Development Agents for Agriculture, Health, Livestock and Natural Resource Management for every Kebele in Ethiopia.

Idir/Edir: Social customary Informal Financial Institutions in the Village help the people in emergencies like death ceremonies, disasters like drought, and floods.

Iqub/Equb: It is a traditional Informal economic Institution existing in both the Urban and the Village that saves cash. Equb will help poor people who cannot buy clothing, food, household equipment, etc. The small group consists of 30 to 40 members of the society who used to contribute 2 to 5 Birr weekly, and each member collects a maximum of 300 Birr. It is one of the popular mutual support schemes often formed by people affiliated.

In other words, the number of members depends on the availability of like-minded people in the locality. Besides, the amount of money each member can contribute also depends on the health of all members. Collection time can also be determined based on mutual agreements weekly, every 15 days or monthly.

Indigenous Social Insurance Systems: Idir/Edir, Mahber, Iqub/Equb

Kebele: A type of administrative division at the lower level, higher than the village. Kebele means “Village” in the Ethiopian language. The Kebele is the basic administrative unit of the Ethiopia Government.

Kert: Small plot size of land equivalent to 0.05 hectares

Kolla: Lowland mainly lower than 500 m above sea level.

Mahber: It refers to a support union, which is usually formed based on religious, ethnic, professional etc., affiliation whereby members contribute some amount of money voluntarily, which they will later use for individual, group, or community support programs.

Meher : Short Rainy Season starts from July to September every year

Time Difference: Ethiopia Standard Time is 3 hours ahead of Greenwich Mean Time (GMT+3). Ethiopia is in East Africa Time Zone (EAT).

Timid: Size of a plot of land covered by one pair of Oxen equivalent to 0.25 hectares.

Woreda- is called a “District”. Local administrative above Kebele level, which is equivalent to a District.

Woyne Dega – Mid Highland altitude

Year Difference: An Ethiopian year comprises 13 months, seven years behind the Gregorian Calendar. Ethiopians celebrated the new Millennium on September 11, 2007; the Ethiopians continued with the same calendar that the Roman church amended in 525 AD. Ethiopia's current year is 2012, and the European year is 2020.

9. GLOSSARY

9. GLOSSARY

Absolute poverty: A situation of inability to meet the minimum income levels, food, clothing, healthcare, shelter, and other essentials.

Adaptive Research: Research conducted to validate, modify and/or calibrate a new technology to specific soil, climate, socioeconomic or environmental characteristics of a given area.

Afforestation: Conversion of bare land into forestland by planting forest trees. The planting of a forest crop on land that has not previously or not recently carried in a forest crop.

After-Cultivation: Harrowing, rolling, tilling, and other cultivations carried out in a field after the crop has emerged

Agrarian system: The pattern of land distribution, ownership, management, and the agrarian economy's social and institutional structure.

Agribusiness: Agriculturally related businesses that supply inputs (such as fertilizer or equipment) or are involved in the marketing of farm products, such as warehouses, processors, wholesalers, transporters and retailers. The combination of the producing operations of a farm, the manufacture and distribution of farm equipment and supplies and the processing, storage and distribution of farm commodities.

Agriculture area: Land used primarily for producing or collecting farm commodities. According to the land uses, a distinction between arable land, land under protective cover, land under permanent crops in open-air, land under permanent meadows, and pastures

Agriculture holding: Economic unit of agricultural production under single management comprising all livestock kept and all land used wholly or partly for agricultural production, without regard to title, legal form or size.

Agricultural Operation: The management and use of farming resources to produce crops, livestock or poultry.

Agricultural Production: Measured in the total output of a crop.

Agriculture: A broad class of resource uses includes all forms of land use to produce biological (biotic) products –animal or plant. The fundamental basis for agriculture is the miraculous process of photosynthesis, the many valuable products synthesized by it, and plants and animals, including human beings. Nature has endowed soils with immense nutrients, which support much of the agricultural activity. Agriculture is now predominantly dependent on external nutrient support to supplement soil fertility.

Agro-climatic Regions: The grouping of different physical areas into broadly homogenous zones based on climatic and edaphic factors.

Agro-ecological Zone: A land resource mapping unit, defined in terms of climate, landform, soils, and land cover, and having a specific range of potentials and constraints for land use. Essential elements in defining an agro-ecological zone are the growing period, the temperature regime and the soil units. A significant area of land is broadly homogenous in climatic and edaphic factors but not necessarily contiguous, where a specific crop exhibits roughly the same biological expression. Zones of similar agricultural performance are defined by soil and climate.

Altitude: Vertical distance above sea level.

Analysis of Variance: Analysis of variance is a method for testing a hypothesis about means. It is the most widely used statistical inference method for analysing experimental data.

Annual Crops: Crop plants complete their life cycles within a season or year, such as rice, wheat, maize, coffee and plantains. They produce a crop of seeds and die. Some of these crop plants may produce tillers. If such rooted tillers are separated from the main shoot and

planted, each tiller will survive that season as a new plant but will not live until another disease.

Applied Research: Research in which the results can be used immediately by the farmer and applied to particular practical problems in the country or a region.

Arable Land: Land is ploughed, and crops are cultivated: agriculture is based on field crops such as Sorghum, millet, maize and vegetables. Arable land includes all land used in most years for growing temporary crops and lying fallow or has not been sown due to unforeseen circumstances. Arable land does not include land under permanent crops or land under protective cover.

Asset ownership: Land ownership, physical capital (factories, buildings, machinery, etc.), human capital, and financial resources generate income for owners.

Attitudes: The states of mind or feelings of an individual, group, or society regarding issues such as material gain, hard work, saving for the future, and sharing the wealth.

Basic education: The attainment of literacy, arithmetic competence, and elementary vocational skills.

Case Study: The detailed study of an individual unit such as a household, farm, enterprise or activity. It contrasts with the survey approach in which several units are studied. The case-study approach is helpful for familiarisation and teaching purposes, whereas the survey approach is more oriented toward gaining information about the population of the relevant unit.

Commercial Farming: Specialized farming enterprise that is capital-intensive and aimed at profit maximization.

Conservation of Natural Resources: The main principles of protecting natural resources are related to the improvement and use of natural resources that will assure their highest

economic or social benefits for humans and their environment now and into the future. The management of human use of the biosphere may yield the most significant sustainable benefit to current generations while maintaining its potential to meet the needs and aspirations of future generations. Thus conservation is positive, embracing preservation, maintenance, sustainable utilization, restoration and enhancement of the natural environment.

Contiguous Drought: Drought resulting from irregular precipitation patterns cause a moisture deficit during the rainy season.

Contour: Linear demarcations of the land surface indicate places of equal elevation; the lines on a map connect these points.

Crop Productivity: The quantitative production of a crop in its primary production per unit of land area. Usually expressed as kg or tonnes per hectare. Same as crop yield. Example. Eight Tonnes grain/ha.

Crop Yield: The data reported under this element represent the harvested production per unit of harvested area for crop products. In most cases, yield data are not recorded but obtained by dividing the data stored under the production element by those recorded under the element; area harvested. Data are recorded in Kilograms or tons per hectare.

Cropping Pattern: The yearly sequence and spatial arrangement of the crops or crops and fallow in a given area. Includes sequential or multiple cropping, intercropping, mixed cropping, relay cropping etc. Example: rice followed by wheat, maize followed by wheat followed by the green gram.

Cultivable Area: Area of land potentially fit for cultivation. This term may or may not include part or all of the forests and rangeland.

Cultivar: A variety of plant species produced by selected breeding.

Cultivation: A tillage operation used in preparing land for seeding or transplanting or later for weed control and loosening the soil. Growing field crops, vegetables, fruits, trees, flowers, and fish.

Dairy Farm: A commercial establishment for processing or selling milk and milk products.

Demonstration: Practically showing the user the working of a particular practice or technology developed and established on a research farm.

Disaster: A natural catastrophe, technological accident, or effect of the climate change of drought, then rural farmer households become poorer or human-caused event resulting in severe property damage, deaths and/or multiple injuries.

Drought: An insufficient moisture supply from precipitation or soil for optimum plant growth. A period of abnormally dry weather was sufficiently prolonged for the lack of water to cause a severe hydrologic imbalance (i.e. crop damage) in the affected area. Drought severity depends upon the degree of moisture deficiency and the affected area's duration and size. It is months or years when a region notes a deficiency in its water supply. Generally, a region receives below-average precipitation over an extended period. It is usually ranging from several months to several years. Although droughts can cause significant damage, drought is a typical, recurrent feature of the climate for most regions. Having adequate drought mitigation strategies in place can significantly reduce the impact. In the worst-case scenario, recurring drought can also bring about desertification. As a drought persists, its conditions worsen, and its impact on the local population gradually increases.

Dry Farming: The practice of crop production in low-rainfall areas without irrigation. Crop production without supplementary irrigation in semi-arid regions is dependent on precipitation. Dryland farming requires the capture and efficient use of precipitation. Therefore, farming activities should be focused on retaining precipitation, reducing

evaporation and utilizing drought-tolerant crops. Rainfed farming includes dryland farming, though these terms are not interchangeable. Both systems exclude irrigation, but rainfed agriculture can emphasize, i.e. the safe disposal of excess water.

Central Tendency: There are many measures of the centre of a distribution. These are called measures of Central Tendency. The most common are the mean, median and mode.

Class Interval: The class interval is a data division used in a histogram. For instance, it is possible to partition scores on a 100 point into class intervals of 1-25, 26-49, 50-74 and 75-100.

Confidence Interval: A confidence interval is a range of scores likely to contain the parameters being estimated. Intervals can be more likely to contain the parameters: 95% of 95% confidence intervals contain the estimated parameter, whereas 99% of 99% confidence intervals contain the estimated parameter. The wider the confidence interval, the more uncertainty there is about the parameter's value.

Constant: A value that does not change values such as Ti or the mass of the Earth is constant

Continuous Variables: Variables can take on any value in a specific range. Time and distance are continuous; gender SAT score and “time rounded to the nearest second” are not. Variables that are not continuous are known as discrete variables. No measured variable is genuinely continuous. However, discrete variables measured with enough precision can often be considered continuous for practical purposes.

Dependent Variable: A variable that is explained or affected by another variable. A variable that measures the experimental outcome. In most experiments, the effects of the independent variable on the dependent variables are observed.

Developing Countries: Asia, Africa, the Middle East, Latin America, Eastern Europe, and the former Soviet Union are presently characterized by low living and other developmental deficits. Used in the development literature as a synonym for less developed countries.

Development: The process of improving the quality of all human lives and capabilities by raising people's levels of living, self-esteem, and freedom.

Diversified (mixed) farming: The production of staple and cash crops and simple animal husbandry is typical of the first stage in the transition from subsistence to specialized farming.

Discrete Variable: Variables that can only take on a definite number of values are called "discrete variables". All qualitative variables are discrete.

Dummy Variable: An artificial variable

Ecological Resilience: Ecological resilience can be defined in two ways. The first is measuring the magnitude of disturbance that can be absorbed before the ecosystem changes its structure by changing the control behaviour variables and processes. The second, a more traditional meaning, is a measure of resistance to disturbance and the return speed to the equilibrium state of an ecosystem.

Economically Sustainable: The characteristic of prolonged, careful, efficient and prudent (wise and judicious) resources (natural, fiscal, human), products, facilities and services. It is based on thorough knowledge and involves operating with little waste and accounting for all costs and benefits, including those not marketable and can result in savings.

Environment: The combined external condition affecting an organism's life, development and survival or ecosystem.

Environmental capital: The portion of a country's overall capital assets directly related to the environment - for example, forests, soil quality, and groundwater.

Environmental System: A system where life interacts with the various abiotic components in the atmosphere, hydrosphere and lithosphere.

Environmentally Sound: The maintenance of a healthy environment and the protection of life-sustaining ecological processes. It is based on thorough knowledge and requires or will result in products, manufacturing processes, developments, etc., which are in harmony with essential ecological processes and human health.

Factors of production: Resources or inputs required to produce a good or a service, such as land, labour, and capital. The inputs used in a production process. Generally, terms can be classified as land, labour, capital and management. However, in functional production analysis, management is not usually included as it cannot be readily measured, and land, labour and capital may be further divided into different types.

Family farm: A farm plot owned and operated by a single household.

Farm Enterprise: An individual crop or animal production function within a farming the system is the smallest unit for which resource use and cost return analysis is usually carried out.

Farmer: The principal decision-maker involved in the management of a farm. Usually, but not always, will be head of the household. Sometimes the choice of principal decision-maker will be somewhat arbitrary since the decision-making may sometimes be segregated for different farm activities.

Farming System: Unit of analysis of agricultural production, defined by the components and boundaries and the types of interactions among the components and environments outside the boundaries. Farming systems include all agricultural and non-agricultural, under the control of farm household units. For example, a decision-making unit comprises a farm household, cropping, livestock systems, and fish production systems that produce crop and animal products for consumption and sale.

Farm System Analysis: Investigating farm-level constraints, translating this knowledge into improved technologies, and testing this technology.

Farming Systems Types: Shifting cultivation, fallow systems, ley and dairy systems, systems with permanent upland cultivation, systems with arable irrigation farming, perennial crops and grazing systems etc.

Fixed Assets: Durable assets represent long-term investments for more than one production cycle. Examples were breeding livestock, plant and machinery, land and building etc.

Food Insecurity: A situation exists when people lack secure access to sufficient amounts of safe and nutritious food for average growth and development and active and healthy life. It may be caused by the unavailability of food, insufficient purchasing power, inappropriate distribution, or inadequate use of food at the household level. Food insecurity may be chronic, seasonal or transitory.

Food Security: Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. A situation exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.

Focus Group Discussion: A qualitative data collection method in which the information is collected in a group context through relevant discussion.

Gender Analysis: The systematic effort to document and understand the roles of women and men within a given context. Gender analysis is a tool to strengthen development planning, implementation, monitoring and evaluation; to make programmes and projects more efficient and relevant. Ignoring gender issues and the resulting gender-blind development strategies have caused many development programs and projects to fail to reach their principal goals and the desired benefits to the target population and has

sometimes led to unintended negative impacts. The current situation of the rural women and men with different issues/problems and the impact of agricultural and rural development policies, legislation and projects, and programmes on women and men respectively – and their relations – should be analyzed before any decisions are made. The such analysis aims to formulate development interventions better targeted to meet women's and men's needs and constraints.

Growing Season: Used generally, not as a technical term, to refer to the period of the year when most crops are grown, e.g. the rainy season. The period of a year when the environment enables farmers to produce a crop of economic value.

Habitat: The place or type of site where species and communities typically live or grow is usually characterized by a relatively uniform portion of the physical features or consistent plant form. Deserts, Lakes and forests are all habitats.

Heterogeneous: Non-uniform, variable, coming from outside. Their heterogeneous nature causes their outside. Their heterogeneous nature causes their constituents to segregate. Example: physical fertilizer mixtures.

Household: A household in the Ethiopian case is understood similarly as FAO (2005:4) defines "a household is an economic unit of agricultural production under single management comprising all livestock kept and all land used wholly or partly for agricultural production purposes, without regard to title, legal form or size". Households represent rural societies' primary production and consumption unit and are agents of economic change. ii. Composed of the farmer and his family and is considered both the production and consumption unit of the social organization. The household can be managed by one person or operation collectively. Family members live, sleep, eat, share the same place, and divide household duties, general farm management, and work.

Human capital: Productive investments embodied in human persons, including skills, abilities, ideals, health, and locations, often resulting from expenditures on education, on-the-job training programs, and medical care.

Independent Variable: A variable that does not need to be explained by or is not affected by another variable. The variable is manipulated by the experimenter, as opposed to dependent variables. Most experiments observe the effect of the independent variable(s) on the dependent variable.

Indicator: A directly observable trait used to define a variable empirically.

Inferential Statistics: The type of statistics that makes conclusions from data derived through sampling and projects them onto the population

Informal sector: The part of the urban economy of developing countries characterized by small competitive individual or family firms, petty retail trade and services, labour-intensive methods, free entry, and market-determined factor and product prices.

Infrastructure: Facilities enable economic activity and markets, such as transportation, communication and distribution networks, utilities, water, sewer, and energy supply systems.

Intensive Cropping Systems: Such cropping systems make relatively continuous use of the land for crop production. These do not allow a fallow period, and two or more seasonal crops can be raised in a year on the same piece of land through sequence cropping, inter/mixed cropping or both. Example: rice-wheat system, maize-wheat-green gram system, coconut-pineapple-black pepper multi-storeyed cropping systems in which 4 crops grow in a field at any given time.

Intensive Cropping: Maximum land use utilizing regular succession of harvested crops.

Intensive Farming: A farming system produces the maximum number of crops in a year with a high yield from the land available and maintains a high livestock stocking rate.

Inventory is a list of assets and liabilities, which are claims or debts against the business; in other words, it is a detailed list of farm properties with the value assigned.

Integrated Rural Development: The broad spectrum of rural development activities, including small-farmer agricultural progress, the provision of physical and social infrastructure, the development of rural nonfarm industries, and the capacity of the rural sector to sustain and accelerate the pace of these improvements over time.

Key Informants: These are community members who are exceptionally qualified to provide information about local conditions, usually due to their position within the community, e.g. local officials, community leaders, and other development workers. Key informants may provide background information or introductions to other community members or groups. The qualitative information will help to triangulate with quantitative data of the research.

Land Area: Total area excluding area under inland water bodies.

Landholdings: Land owned or occupied or used by farmers or tenant farmers.

Landscape: The fundamental traits of a specific geographic area, including its biological

Land-use: Land-use is characterized by the arrangements and activities inputs people undertake in a specific land cover type to produce, change, or directly link land cover and people's actions in their environment. A crop is not land use. The recreation area is a land use term for different land cover types: sandy surfaces like a beach, a built-up area like a luna park, a forest etc.

Land reform: A deliberate attempt to reorganize and transform agricultural systems to foster an equal distribution of agricultural incomes and facilitate rural development.

Least developed countries: A United Nations designation of countries with low income, low human capital, and high economic vulnerability.

Less developed countries: A synonym for developing countries.

Likert Scale: The respondent has to choose a scale introduced by Likert employing a set of response categories ranging from positive to very negative.

Linear Regression: A method of estimating the value of a Dependent Variable when the values of two interval scaled and normally distributed variables are known.

Literacy: The ability to read and write.

Livelihood Diversification: In this study, livelihood diversification refers to the attempts by households to construct diverse ways to raise incomes and reduce vulnerability to different livelihood shocks. Therefore, livelihoods diversification is defined comprehensively as the proportion of both on-farm and non/off-farm activities in households' income-generating portfolios. Livelihood diversification can occur through agricultural diversification, i.e., producing multiple crops or high-value crops and livestock, and non-agricultural livelihood diversification, i.e., undertaking small enterprises or choosing nonagricultural livelihoods like casual labour or migration.

Livestock Systems: A subset of farming systems, including cases in which livestock contribute more than 10 per cent to total farm output in value terms or where intermediate contribution such as animal traction or manure represents more than 10 per cent of the total value of purchased inputs.

Livestock Unit: A standard live weight unit for all grazing animals based on their respective live weight. A standard LU is 500Kg, with adult cattle representing 1.0 LU and adult sheep representing 0.0 LU.

Livestock: Refers to all animals kept or reared, mainly for agricultural purposes. Includes aquaculture for fish production.

Low-income countries (LICs): In the World Bank classification, countries with a gross national income per capita of less than $976 in 2008.

Microfinance: Financial services, including credit, supplied in small allotments to people who might otherwise have no access to them or have access only on very unfavourable terms, including micro-savings and micro-insurance and microcredit.

Millennium Development Goals (MDGs): A set of eight goals adopted by the United Nations in 2000: to eradicate extreme poverty and hunger; achieve universal primary education; promote gender equality and empower women; reduce child mortality; improve maternal health; combat HIV/AIDS, malaria, and other diseases; ensure environmental sustainability, and develop a global partnership for development. The goals are assigned specific targets to be achieved by 2015.

Multiple Regression: Multiple regression is linear regression in which two or more predictor variables are used to predict the criterion

Non-farm Income: The typical non-farm activities that are pursued by rural households in Ethiopia: non-farm rural salaried employment; non-farm rural self-employment (sometimes called micro-enterprise income); rental income obtained from leasing land or property; urban to rural remittances arising from within national boundaries; other urban transfers to rural households, for example, pension payments and international remittances arising from cross-border migration.

Non-Governmental Organizations (NGOs): Nonprofit organizations often provide financial and technical assistance in developing countries.

Off-farm income involves working on other farms for wages or arrangements such as sharecropping or in-kind labour exchange. Off-farm income is strictly defined as income generated from working outside one's own farm through participating in ploughing, weeding or harvesting on another farmer's land. Moreover, we also consider income from

local environmental resource extraction such as firewood collection, charcoal production and gathering of wild fruits as off-farm income.

On-farm Income: Income generated from one's own farming, whether on owner-occupied land or leased land, includes livestock and crop income. Income is derived from crop production and the rearing and selling of animals. This includes income earned from commercial woodlots and beekeeping.

Pilot Study: A complete replica of the leading research study employed in a fraction of the sample.

Positive Association: There is a Positive association between X and Y if smaller values of X are associated with smaller values of Y and larger values of X are associated with larger Y values.

Pre-test: A small-scale test administered before introducing a study aimed at measuring the efficacy of one or more main study elements. It helps to modify and update the Interview Schedule/Questionnaire.

Qualitative Data: The data collected should be from older people who are highly experienced in the research area.

Quantitative Data: The data to be collected from the concerned respondents or any published reports quantitatively.

Qualitative Variable: Also known as Categorical Variables, qualitative variables with no natural sense of order. They are, therefore, measured on a nominal scale.

Random Sampling: The process of selecting a subset of the population for statistical inference. Random sampling means that every member of the population is equally likely to be chosen.

Regression: Regression means “prediction”. The regression of Y on X is the prediction of Y by X.

Regression Analysis: A method employed to study the relationship between variables, especially the extent to which a dependent variable functions one or more independent variables.

Sample: A group of units chosen to be included in a study

Significance: A criterion related to the validity of data.

Significance Level: In significance testing, the significance level is the highest value of a probability value for which the null hypothesis is rejected. Expected significance levels are 0.05 and 0.01. If the 0.05 level is used, the null hypothesis is rejected if the probability value is less than or equal to 0.05.

Smallholder Farmer: In Ethiopia, the smallholder farmer meets the conventional meaning of small farms of less than 2 hectares per household. They are known for their resource constraints like capital, inputs and technology; their heavy dependence on household labour; their subsistence orientation; and their exposure to risks such as reduced yields, crop failure and low prices

SPSS: A statistical package for Social Sciences that the software could support with the help of computer-assisted research data analysis.

Social capital: The productive value of social institutions and norms, including group trust, expected cooperative behaviours with predictable punishments for deviations, and a shared history of successful collective action, raise expectations for participation in future cooperative behaviour.

Social system: The organizational and institutional structure of a society, including its values, attitudes, power structure, and traditions.

Staple food: A leading food consumed by a large portion of a country's population.

Stakeholders: A large group of individuals and groups of individuals (including governmental and non-governmental institutions, traditional communities, universities, research institutions, development agencies and banks, donors etc.) with an interest or claim (whether stated or implied) which has the potential of having an impact on a given project and its objectives. Stakeholders with a direct or indirect "stake" can be at the household, community, local, regional, national or international levels.

Subsistence Crop: The crop grown under problematic conditions when no other crop can be grown, such as floating rice in flood-prone areas.

Subsistence farm: A low-income farm emphasising production for the farmer's use or the farmer's family rather than for sale.

Subsistence Farming: Growing crops and, where appropriate, keeping animals to provide food (cereals, pulses, vegetables and fruits), shelter materials, and possibly other products (fibres, medicinals) for family use.

Sustainability: Managing soil and crop cultural practices to not degrade or impair environmental quality on or off-site without eventually reducing yield potential due to the chosen practice through exhaustion of either on-site or non-renewable inputs.

Sustainable Agriculture and Rural Development (SARD): The management and conservation of the natural resource base and the orientation of technological and institutional change in such a manner as to ensure the attainment and continued satisfaction of human needs for present and future generations. Such sustainable development (in agriculture, forestry and fisheries sectors) conserves land, water, plant and animal genetic resources, is environmentally non-degrading, technically appropriate, economically viable, and socially acceptable.

Sustainable Development: The management and conservation of the natural base, and the orientation of technological and institutional change, in such a manner as to ensure the attainment and continued satisfaction of human needs for present and future generations. It conserves land, water, plant and animal genetic resources, is environmentally non-degrading, technically appropriate, economically feasible and socially acceptable.

Sustainable land use: Land use that achieves production sufficient to meet the needs of present and future populations while conserving or enhancing the land resources on which that production depends.

Sustainable Production Systems: Production systems are designed to remain viable indefinitely by not degrading the resource base, impeding continued production indefinitely. Sustainable implies continuous improvement based on the concept that we continue to learn about the results of our interaction with complex ecosystems. Therefore, we must remain in a constant mode of learning and documentation to hone our systems toward a perfect form.

Sustainable Use: The use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations. The uses of the biological products and ecological services of ecosystems are in a manner and at a rate that does not reduce the system's ability to provide those products and services to future generations. Sustainable use of the environment and its living resources is used at a rate that does not exceed its capacity for renewal to ensure its availability for future generations. Thus, sustainable management involves our current generation while conserving natural resources and protecting the environment to benefit future generations.

Sustainable: Production systems that can meet present needs without reducing the capability to meet future needs. FAO has defined sustainability as "Sustainable development is the management and conservation of technological and institutional change in such a manner as to ensure the attainment and continued satisfaction of human needs for present and future generations. Such sustainable development conserves land,

water, plant and animal genetic resources, is environmentally non-degrading, technically appropriate, economically viable and socially acceptable".

Topography: The relief exhibited by a surface. Refers to the differences in elevation of the land surface on a broad scale. It is derived from the site's most representative or characteristic slope gradient.

Watershed: (catchment, catchment area, drainage area, drainage basin, river basin): A physiographic unit in the landscape defined by the drainage dividers around the area drained by a particular body of water. If a lake, there is often one watershed with subunits for contributing streams. If a river, it may be defined for any point or all. The whole surface drainage area contributes to water or a lake. The total area above a given point on a stream contributes water to the flow at that point (syn: 'drainage basin', 'river basin'). Regardless of size, the total area above a given point on a waterway contributes runoff water to the flow at the point. A major drain-area subdivision of a drainage basin is based on this concept.

Wealth Ranking: Information on households' relative wealth (or well-being) in a community can be gathered. Community members define how wealth (or well-being) is perceived locally and then put households into those with the least significant wealth level. This technique is best used with individuals, but it should be carried out with at least three community members to avoid inherent biases arising due to the status of the respondents.

Yield: The aggregate of products from growth or cultivation, usually expressed in quantity per area. Amount of production per unit area over a given time. A measure of agricultural production. Crop yield can be total dry matter yield (grain+straw) or economic yield (grain only). They are usually expressed as Kg/ha, Mg/ha (Mg=Megagrams) or tonnes/ha. The expression "quintals (100/Kg) /ha" is getting out of use.

Subsistence farming: Farming in which crop production, stock rearing, and other activities are conducted mainly for personal consumption.

Sustainable development: A pattern of development that permits future generations to live at least and the current generation, generally requiring at least a minimum environmental protection.

Survey: A method of data collection employing systematic and structured verbal or written questioning.

Sustenance: The essential goods and services, such as food, clothing, and shelter, are necessary to sustain an average human being at the bare minimum level of living.

Triangulation: A research approach employing more than one data collection and analysis method.

Underdevelopment: An economic situation characterized by persistent low levels of living in conjunction with absolute poverty, low income per capita, low rates of economic growth, low consumption levels, poor health services, high death rates, high birth rates, dependence on foreign economies, and limited freedom to choose among activities that satisfy human wants.

World Bank: An organization known as an “international financial institution” that provides development funds to developing countries in interest-bearing loans, grants, and technical assistance.

10. SUBJECT INDEX

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Prof. Dr. Samantha Curle
Assistant Professor, Dept. of Education, University of Bath, UK

Livelihood strategies are at the centre of rural development. However, identifying the numerous factors that determine the rural households' choice of livelihood strategies in Ethiopia needs a systematic intervention approach to decrease the threat to the poor. The agricultural sector cannot support a rapidly increasing rural population with its prevailing technology, labour productivity, and policy environment. Ethiopia's primary dependence on subsistence crop production and harvest failure led to household food deficits. The absence of off-farm and /or non-farm income opportunities and/or other means such as timely food assistance led to asset depletion increasing levels of destitution at the household level. This book will enlighten the knowledge of livelihood strategies to sustain the rural households in Ethiopia.

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2030 Sustainable Development Goals emphasize that everyone should have equal living conditions in the World. However, many people from developed, developing, or least developed countries do not have equal living standards. Significantly, there is a massive gap in living conditions for people from the African region. At this point, higher income or new jobs can increase people's living standards in the related region. This book investigates the choice of livelihood diversification strategies of rural households in Boloso Sore Woreda, Ethiopia. By giving new empirical pieces of evidence from Ethiopia, this study this book can contribute both to policymakers and future studies.

Prof. Dr. Predrag Ilic
Director and Scientific Advisor of Institute for Protection and Ecology, Banja Luka, Republic of Srpska, Bosnia

Livelihood Diversification is one of the survival strategies to come out of poverty in most developing countries. However, the vast majority of African countries continue to face widespread poverty. Most Ethiopian farmers who live in rural areas are engaged in rain-fed subsistence agriculture, and agriculture remains the primary means of livelihood. Rural people partake in several strategies, including agriculture intensification and livelihood diversification which enable them to attain food security; however, they are still unable to escape food insecurity. Another big challenge of the Ethiopian farmers is climate change which hinders the African farmers in general and Ethiopian farmers in particular. With farm size and productivity declining, low non-farm income, and depleting assets, the capacity of the rural population has thus diminished to cope with droughts and production failures. This book could bring alternative jobs to the farming community apart from agriculture to make the farmers busy throughout the year.

Prof. Dr. Djenebe Traore
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Livelihood strategies combine activities people undertake to achieve their livelihood goals. Rural people use strategies to attain their goals, including agricultural intensification and livelihood diversification. There are three types of Livelihood Diversification activities, such as Agricultural Intensification: These strategies mainly continue or increase dependence on agriculture, either by intensifying resource use by applying more significant quantities of labor or capital for a given land area by bringing more land into cultivation or grazing. Livelihood Diversification: Diversification here may broaden the range of on-farm activities (e.g., adding value to primary products by processing or semi-processing them) or diversify off-farm activities by taking up new jobs. The book will expose the importance of agriculture and livelihood diversification to support the Ethiopian farmers to have an opportunity to undertake different agri-related jobs in the village itself.

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