ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

CENTER OF REGIONAL AND LOCAL DEVELOPMENT STUDY

LIVELIHOOD DIVERSIFICATION IN AMIBERA PASTORAL COMMUNITIES OF AFAR REGION: DETERMINANTS AND CHALLENGES

A Thesis Submitted to

The center of regional and local development studies of Addis Ababa University

Presented in Partial Fulfillment of the requirement for the degree of Masters of Art in Regional and Local Development Studies (RLDS)

Yassin Ahmed Yassin

May, 2013

Addis Ababa University

School of Graduate Studies

As a thesis advisor, I herby certify that I have read and evaluated this thesis prepared under my guidance, by Yassin Ahmed Yassin, entitled "**Livelihood Diversification in Amibara Pastoral Communities of Afar regional state: Determinants and Challenges.**" I recommend that it to be submitted as fulfilling the thesis requirement.

Tegegn G/Egzabiher (Prof.)		Ja'n 08/2014
Advisor	Signature	Date

As member of the Board of Examiners of the MA Thesis Open Defense Examination, we certify that we have read, evaluated the thesis prepared by Yassin Ahmed Yassin and examined the candidate. We recommended that the thesis be accepted as fulfilling the Thesis requirement for the degree of Master of Arts in Regional and Local Development Studies.

Signed by the Examining Committee

Issac Poul (PhD)		Sept 11, 2014
Chair person	Signature	Date
Bamlak Alamirew (PhD)		Sept 16, 2014
External Examiner	Signature	Date
Weldeamlak Bewket (PhD))		July 14
Internal Examiner	Signature	Date

Declaration:

The thesis is my original work, has not been presented for a degree in any other university and that all sources of material used for the thesis have been duly acknowledged.

Yassin Ahmed Yassin

June 2014

This thesis has been submitted for examination with my approval as a university advisor.

Tegegn G/Egzabiher (Prof.)

June 2014

ACKNOWLEDGEMENTS

First and foremost let me praise and honor the almighty God for the opportunity and capacity given to me to realize my aspiration. Several individuals and organizations deserve acknowledgement for their contributions to the study. I am greatly indebted to my advisor Tegegn G/Egzabiher (Prof.) for his unreserved help, advice, directing, insight guidance, critical review of my thesis manuscript, invaluable support and suggestions as without their professional help it was difficult to be successful in my academic, research work and thesis write up. I am also deeply grateful to Afar region state cooperative promotion office for offering me full sponsorship of the research works.

I acknowledge the help received from Ato Shimola an expert in Pastoral, Agricultural and rural dev't office in the study area. Smallholder farmers in the study area and other collaborated individuals deserve special thanks for their unforgettable cooperation during data collection.

Table of Content

List of Table **Page**

List of figure

LIST OF ABBREVIATIONS

AU-IBAR- Africa Union/Inter Africa Bureau for Animal resource

FAO- Food and Agriculture Organization

FGD-Focus Group Discussion

GDP-Gross Domestic Product

LPS- Livestock production system

MDGs-Millennium Development Goals

NGOs-Non-governmental Organization

SHG-Self Help Group

TLU-Tropical Livestock Unit

WB-World Bank

Livelihood Diversification in Amibara Pastoral Communities of Afar regional state: Determinants and Challenges

Abstract

Key words: Pastoralist, non-pastoral economic activities, livelihood diversification

The Afar survives for centuries through practicing their traditional production system and way of life that is friendly to the Socio-economic and ecology of the area they inhabit. However, during the imperial period the Afar pastoralist have faced a challenge after their communal grazing lands are incorporated by large commercial and state farms. This process leads them to impoverishment, resource scarcity, vulnerability to drought and land degradation. This and other reasons forced the pastoralists in the study area to engage in different non-pastoral economic activities to realize their desired livelihood outcomes. The purpose of this study was therefore, to understand traditional and alternative livelihood strategies undertaken by the pastoral households, the determinant factors that influence livelihood diversification, and the constraints that pastoralists faced in diversifying their livelihood. Multi-stage stratified random sampling procedure was followed to select three peasant associations (one from pastoral and two from agro-pastoral PA), and each peasant associations were stratified in to three wealth stratum. Then 100 households were proportionally selected among each stratum. Both qualitative and quantitative methods were used to collect essential data. Questionnaire were used to collect quantitative data, whereas, FGD& key informant interviews were undertaken to collect qualitative data. Secondary data were also used in the study. Both descriptive and econometric model were used to analyze the data. The descriptive statistics used includes X^2-test & independent t-test, one-way ANOVA, frequency, percentage, mean, and standard deviation; and the econometric model used was logistic regression. The result shows that the better-off wealth group was less diversified as compared to other wealth groups. Only 41.2% of them were diversified and 48.8% of them was still depends only on livestock production. While, 90.6% of the poor households were diversified and mostly involved in wage labor in the nearby large commercial farms. The logit model result shows that, Age of household head, livestock size, distance from the nearest town and dependency ratio have a significant and negative influence of livelihood diversification, whereas, family size, farm size, average education of the household and sex of the household head have a significant and positive influence on diversification. However, livestock size does not have statistically significant influence on livelihood diversification. Moreover, the pastoralists in the study area constrained by different factors in pursuing alternative livelihood such as, lack of initial capital, lack of agricultural input, the expansion of P.julifora in most farm and grazing lands, etc. Considering diversification of livelihood as an important means to ensure food security, the government should increase its effort on human capital development. Agricultural input and credit service should also provided by the concerned bodies.

CHAPTER-ONE

1. INTRODUCTION

1.1. Background of the study

Pastoralism is a livelihood which is extensively followed across the world. It supports 20 million households and roughly 240 million individuals, being practiced in 25% of the globe and providing 10% of the world's meat production (FAO, 2001; Nori et al., 2008). Pastoralism involves the extensive use of grasslands for livestock production and is one of the key production systems in dry lands (FAO, 2001). In Ethiopia the 8 to 9 million pastoralists (ACDI/VOCA, 2008) of an estimated national population of 70.7 million (World Bank, 2008), harbor Africa's largest livestock population.

Ethiopia is the world's tenth largest livestock producer and the biggest exporter of livestock in Africa. The country has 53.99 million cattle, 25.5 million sheep, 24.06 million goats and 0.9 million camels, according to a sample census carried out by the Central Statistics Authority of Ethiopia between 2013. Ethiopia presently offers the global market a wide range of processed and semi-processed hides and skins. Some of the products, such as Ethiopian highland sheepskin, are renowned for their quality and natural characteristics. The export of finished leather and leather products (such as leather garments, footwear, gloves, bags and other leather articles) is also increasing.

A study by the African Union/Inter-African Bureau for Animal Resources (AU-IBAR) found that in Ethiopia, livestock contribute about 40% of agricultural GDP and more than 20% of the total GDP and perhaps even more if other intermediate values of livestock are properly assessed. Despite this, however, between 1993/4 and 1998/9, the Government of Ethiopia only allocated 5% of its expenditures to agriculture and less than 0.3% to livestock (Aklilu, 2002 cited in Behnke et al., 2006).

The livelihood of pastoralists is largely from animal production; both from animal products directly consumed and goods purchased with revenues gained from the sale of livestock and livestock products. Pastoralism requires conditions of medium human population densities and extensive rangelands. It also requires a common property system as well as a flexible social structure and settlement pattern that allows all stockowners in a community to access productive resources and to move flexibly.

Traditionally, pastoralists employed various coping mechanisms to sustain their pastoral economy. The strategies used by pastoralists to manage the environment in a sustainable way are Livestock adaptation, Mobility, Diversification of livestock species and breeds, Reserve of rich-patch vegetation areas, Maximization of stock numbers, splitting of herd. Livestock adaptation ensures that, Pastoralists own any of a wide range of indigenous livestock selected on the basis of survival and productivity, and are well adapted to the prevailing climatic conditions. Their rangelands are also characterized by species diversity to optimize different range resources and conserve the ecosystem. Mobility entailed that it is economically logical and environmentally essential. Mobility is, in fact, the only way to make sustainable use of rangelands. Diversification of livestock species and breeds entailed that, by keeping more than one species of livestock, pastoralists can generate a wider variety of livestock products and make better use of the available forage in different seasons, even in times of crisis. Reserve of rich-patch vegetation areas entailed that Pastoralists set aside grazing areas to use as a bank during the dry season or drought times. Maximization of stock numbers entailed that such accumulation helps ensure survival of herds despite losses incurred during droughts or disease outbreaks.

However, the conditions that supported pastoralism and their traditional coping strategies have been affected by persistent drought, Population growth, loss of pastureland by state and private farms, ranches, game parks, and urban areas, increased commoditization and rising inequality within the livestock economy, out-migration of poor pastoralists, and periodic dislocations brought about by drought, famine, and civil war are collectively threatening a way of life that has proved in the past to be a highly adaptive food production system in arid lands. Although the driving forces vary widely from region to region, virtually all of these trends result in declining mobility of livestock, which places in jeopardy the sustainability of both rangeland resources and pastoral livelihoods.

Unable to subsist on livestock alone, pastoralists are increasingly engaged in other economic activities to increase their resilience. With these changes, pastoralism may become an inadequate means of earning a living and diversifying into other livelihood strategies seems more likely if they are to survive, improve their well-being and reduce vulnerability. In recognition to these therefore this study was to identify

livelihood diversification strategies that Amibara pastoral households were adopting or had adopted as traditional pastoralism becomes difficult to pursue; and the factors that determine the livelihood diversification as well as challenges that pastoral households faced in this endeavor.

1.2. Statement of the problem

The Afar survives for centuries through practicing their traditional production system and way of life that is friendly to the Socio-economic and ecology of the area they inhabit. However, since the Imperial regime, the Middle Awash Valley were incorporated in large scale commercial and state farms which refused to recognize the land rights of the Afar and have had severe impact on the Afar and their land. In addition the invasive woody plant, *P. juliflora*, nowadays became the most aggressive, and Problematic trees in the Afar region and causes great devastation in the area among the agro-pastoralists, pastoralists, mechanized farmland owners, and ecologists. It invades the farmlands, rangelands, irrigation canals; narrowing roads (Kassahun Zewdie, 1999) Moreover, agro-pastoralists claim that its impenetrable nature of the species enforces them to migrate to other non-invaded areas. During the main rainy season the flood hazard displace the people away from the Awash River and Allaideghe plain where all the Afar clans' pastoralists evacuate their livestock for grazing during the wet season which nowadays became a national park. And between 1996 and 2007, the number of people in Amibera wereda, increased by more than 63%.

The presence of Awash River and experiences gained from the state farms made the Afar people to recognize the importance of integrating irrigation agriculture with animal husbandry. The people of AmibaraWoreda understand that crop production can provide sufficient food supply, subsequently ensuring their food security and means of resolving conflicts. Moreover, production of crop will reduce long distance travel in search of grazing lands and water points. However, few numbers of households engaged in crop production for home consumption and market sales (Shetie, 2008).The major constraints of the Afar people not to involve in irrigation activities are financial shortage, human capital, and recently the invasion of *P. juliflora* in most irrigation lands. The awareness of pastoralists to involve in non–pastoral activities is increasing (Abdurahman Ame, 2002). The rationale behind this

fact is the occurrence of drought and lack of grazing lands and water points for their livestock.

Given this precarious situation, a traditional pastoral livelihood strategy becomes less sustainable and sufficient to realize desired livelihood outcomes, hence Afar pastoralists, are likely to look for alternative livelihood strategies. In this endeavor, households have varied according to options available and challenges faced. To what extent do these strategies fulfilled their livelihood needs and what challenges does households face in pursuing these strategies, however, need to be known.

Several studies were conducted on the investigation of various development interventions and their adverse consequences on the livelihood of pastoralists in the Awash River. Such works include Abdallah(1993) Abdulhamid (1989), Abdurahman (2002), Ali (1997), Cossins(1972), Getachew (2001), IPS (1996),Maknun (1993), Metaferiya (2000), Yirgalem(2001), Shimelis (2012), Abraham (2004). However, very few attempts have been made to investigate the level and types of livelihood diversification in quantitative approach in the study area. Therefore, the purpose of this paper is to investigate the livelihood diversification strategies of Afar pastoralists in Amibara wereda especially additional livelihood strategies they were adopting/had adopted and the challenges they face/faced in the process as well as the factors that determine livelihood diversification.

1.3. Objectives of the study

1.3.1. General objective

The general objective of the study was to investigate the livelihood diversification strategies of the pastoral communities in Amibera woreda, Afar region.

1.3.2. The specific objectives

- ✓ To determine the status and types of livelihood diversification of the pastoral households
- ✓ To determine the factors influencing diversification of the pastoral households
- ✓ To identify the major constraints or challenges that pastoralists face in diversifying their livelihood

1.4. Research Questions

- ✓ What are the status and type of livelihood diversification of the pastoral households in the study area?
- ✓ What are the major determinants influencing livelihood diversification in the pastoral households?
- ✓ What are the major constraints or challenges pastoralists face in diversifying their livelihood?

1.5. Scope and Limitations of the Study

The livelihood strategies can be analyzed at different level, but this study will focus on identifying livelihood diversification strategies that Amibara pastoral households are adopting or had adopted as traditional pastoralism becomes difficult to pursue; the factors that determine the livelihood diversification strategies, as well as challenges pastoral households faced in this endeavor.

To identify livelihood diversification strategies of pastoral households this study will never use income approaches rather, will focus based on the number of non-pastoral economic activities. Because it is difficult to collect reliable and quantifiable data on income and expenditure, that would help to assess the contribution of each livelihood strategies to household income and expenditure pattern. This is mainly due to time and research fund constraint in generating relevant data under the settlement condition of the pastoralists. However, the relative importance of different livelihood activities and income sources will be judged based on household own perception. Similarly, this study emphasis on the livelihood diversification strategies as carried out by Amibara at the time of the study and, was never attempt to trace the history of how these changes came about.

1.6. Significance of the Study

This study yield information on pastoralist's livelihood strategies, factors that determine livelihood diversification at household level and the challenge faced in their pursuit. Practically, this information is vital in identifying appropriate interventions, which can enhance the capacity of Afar pastoral households and make them more secure. Indirectly, this will tackle poverty and vulnerability and thus contribute to the attainment of one of the Millennium Development Goals (MDGs) – eradication of extreme poverty.

In terms of knowledge, the livelihood diversification strategies, and challenges faced by Afar pastoral households will increase our understanding of how they survive. This information will also help build a balanced picture of pastoralists as they struggle to adjust to the livelihood challenges they face. Moreover, information generated by this study will indicate the extent to which the Afar had changed from their idealized state.

The finding of this study can be used as an input for planning, implementing and targeting the needy segment of the community in their development programs. Thus the outputs of the study enable researchers, development practitioners and local development actors to act on various livelihood strategies, and target the needs and constraints of the households of the study area.

1.7. Organization of the thesis

The thesis has five chapters. After the introduction chapter, literature will be reviewed. Chapter three provides methodology of the study. In this chapter the study area, sampling techniques and method of Collection and analysis are discussed. The fourth chapter presents results and discussions of the study. Finally, chapter five presents conclusion and recommendations.

CHAPTER-TWO

2. Literature review

2.1 Definition and concepts of pastoralism

2.1.1 Definition of pastoralism

Scholars define the concept of pastoralism based on the economical perspectives. However, most of them refers to swifts (1988) definition of pastoral production systems as in which at least 50% of the gross income of household (i.e., the value of the market production and the estimated value of the subsistence production for household consumption) come from pastoralism, or its related activities, or else where more than 15% of the households' food energy consumption involves the milk or dairy products they produce (swift, 1988). Based on the above fact Benlekal also describes that, countries–like morocco defines pastoralism as a livestock system where more than 50% of animal feeding time are come from rangelands (Benkelahl, 2004)

As a matter of fact the above definition and other may provide a useful rule of thumb without taking consideration of some exception which can always be found, but still consider themselves as pastoralists. In other words, there may be many pastoralist households who may not fulfill the above mentioned criteria in their system. Therefore, it is easy to conclude that the definition of pastoralism may vary from place to place or region to region according to the context and other condition.

Besides, the concern of this research is more on the production system [pastoralism] rather than the producers [pastoralists]. Regardless of this concept many scholars agree on the definition of pastoralism regardless of the context to which it contributes to the household economy. Thus the following definition states generally what pastoralism is refers to; "any predominately livestock-based production system that is mainly extensive in nature and use some form of mobility of livestock" (Richared and Davies, 2006)

2.1.2 Conceptualizing pastoralism

Certain contemporary studies on pastoralism have been conducted by different scholars. However, all these works have been shaped and framed by the work of Evans Prichard, who made an extensive research on the nuer people in Southern-

Sudan. His research was based on the ethnographic structure of the people. As Evans sited in Clifford mobhena (2010), the nuer people were highly bound in an intimate symbiosis of survival with their herds. Cattle depend on humane being for protection and care, where as people depend on Cattle as being a source of milk, meat, leather and dung as well as a safety of insurance against ecological hazards. As Evans is added that, cattle are also valued for nuer people far beyond the material contribution to human survival. This Evans's research is Considered as one of the great contribution of anthology to the study of pastoral societies by demonstrating the social and cultural importance of cattle and there pivotal role as principal means by which people create and affirm enduring social bonds amongst theme selves as well as between themselves, their community and divinity"(Evance, 1992).

In almost all of the pastoral societies and other communities of Africa, cattle and other livestock have always been playing a central role in the economic and social life of rural Africa. It is the desire of most households in this part of Africa to own livestock. Most of them have small herds of cattle, Camels, Goats, Sheep's and Donkeys. The struggle to acquire and access for grazing land to feed live stock , small ethnic clashes to control water points and grazing lands, struggle to secure family labor to look after livestock and ward off the dangers of stock theft are still a day to day life for rural households.

In additional to defining the concept of pastoralism from the various directions and perspectives, these scholars also suggest the various livelihood strategies of pastoralist households in Africa so as to improve their income and the entire standard of living. Since dependence only on cattle keeping cannot suppose to fulfill the livelihood of the households as a source of cash income Hodgson (2000) forwards that, the need to expand income from a diverse array of production systems and /or from non – farm based activities is an important livelihood strategy should households under taker. In a sense, mixing a particular kind of livestock (cattle sheep, goats, and / or camels) with other subsistence strategy (cultivation, hunting, gathering, fishing, wage labor, etc) has to be inhabited by the pastoralist households to improve their income from the diverse source of economic activities. Hodgson (2000) is stated as a reason that, herders usually depend on their livestock for food and trade, and in parallel, they had to full fill their animals with food, water and protection. As Ferguson (1992) is commented on the above Haddon's suggestions that it is valuable in the case of

matable land, southern Africa, where many households keep livestock and are also periodically involved in some form of crop production. In addition to provide food, water, and protection for their animals ; these households that depend in some extent on non-farm source of income, are able to purchase and even add another livestock which many of them purchased are acquired from the proceeds of non-farm activities.

Similarly, Little (2000) also argues that herders in north eastern Africa herders increasingly follow non-pastoral income strategies to meet their needs for consumption so as to protect their households from the risk of national disaster and man-made panics caused by climate change , animal disease , market Failure , etc. He further states that unlike crops, livestock are a source of substance and income, as well as a form capital and savings that can yield annual returns, (Little, 2000).

It is generally true that keeping livestock have got a better advantage for pastoralist households to make good pressure of the market and capital formation as well. As a confirmation, little (1992) cited in Hodgson (2000) forwards that □Indeed there is considerable evidence that income from non pastoral activities frequently is invested in livestock. While keeping animals of development markets by earning income from non-pastoral pursuits is also a means of preserving herd capital".

Scones (1989), argues that public policy on range land and livestock development in south Africa still give concern and understanding particularly around the issue of range land ecology and livestock management. He further claims that the science of ecological calamity , the potential damage of livestock grazing, the threat of degradation and desertification ,and the importance of controlling the number of livestock in the grazing land have been the base of the dominate view. Scooner (1989) also gives his own analysis of the pre and post colonial Zimbabwe livestock and rangeland policy. He indicates that the need for modernization of the sector and the need to avoid environmental degradation have been the two major themes which have largely influenced this policy since 1930's

As schooner (1989), further debates on this livestock policy, the two themes have been closely liked and interrelated, with the basic point of view arguing that the only direction to the development of small scale livestock sector is through improving the efficiency of beef production and the minimizing action of the damaging

consequences of traditional form of livestock keeping. However, this policy needed a planned and order land use all over Zimbabwe. According to scooner (1989) , matopos research station was establish prior to independence to improve livestock breeds, pastures and give attention only to commercial centers but paid little concern for Tribal trust lands (TTL's). The research station was achieved a remarkable result in increasing beef production under ranch condition, but little to no result was witnessed in the value of production in the communal areas where livestock farming was undertaken in the primitive way and harsh condition. Even, it was impossible for the Native Department of Agriculture to provide grade bulls in the reserves because of harsh environmental conditions and the scarcity of grazing land. Schooner (1989) concludes that the package only favored the commercial beef farmers at the expenses of communal farmers in the traditional sector. Robbins (1994) also argue that the representation of the communal farming system as ecologically devastating and unproductive still continue shaping agriculture and resettlement policies in contemporary Zimbabwe.

After the failure of the state intervention packaging program Robbins (1994) found that legisa system was blamed for the environmental degradation by the government of Zimbabwe in 1991. The legisa system was a local livestock management system which was used in the communal areas that allow the sending of heard to commonage land beyond the boundaries of the existing settlement during the day seasons in order to supplement grazing. Then, the herds would be brought back to the villages where the rainy season comes. This would increase more viability the local pastoral households to involve and dwell in the communal areas and gave options for stock owners to use and access freely in the communal areas land. In the 1980 ministers in the Zimbabwean government officially opposed the mobility patterns involved in legisa system and it could not be permitted in modern Zimbabwe. Thus the legisa system was terminated by the state to give option for stock owner in the communal areas because of its consequence of environmental challenges. Degradation also undermined the right of pastoral life in the country. Robins (1994) argues that this modernizing ethic, which presented lagisa as pre-modern and traditional, is part of the development discourse that has devalued local knowledge and practices and deemed these traditionalists as unscientific.

In the 1990s the state tried to convince the people of Matabeleland that they would be expanding their livelihoods and strengthening their livestock practices by moving to model D settlements, which were created to expend settlement in the communal areas. Although model D was more sympathetic to extending grazing access in the communal areas, one of its limitations was that it failed to take into account the „lagisa□ system. Ranger (1985) and Alexander (1991) found that model D paddock fences not only hindered livestock movement but were also a catalyst for struggles over pastures. This meant that beneficiaries had to agree to participate in villagisation and comply with the demarcation of their villages into residential, arable and grazing blocks, and adopt livestock limitation practices (destocking). The urgency with which this scheme was introduced reflected a growing desire from within the state to extend control over the rural population.

Ranger (1985) and Alexander (1991) revealed that the implementation of model D was imposed without adequate consultation with the local people, and in spite of the social and economic dislocation it caused. Robins (1994) observed that opposition to the scheme after the unity agreement led to fence cutting and poach grazing among other reactions.

In the current period, this marginalization of communal livestock farmers has persisted under the FTLRRP. This is less the result of a coherent new set of policies which replicate the older pattern than a consequence of the absence of a clear policy framework for livestock management in the current period. In fact, the obsession of the Mugabe government with the redistribution of land as an end in itself rather than with the creation of viable rural livelihood options for rural people has led to a collapse of policy making in the rural sector, especially in relation to the pastoral economy. In the absence of new directives, older practices tend to replicate themselves at the local level.

2.2 Pastotoral system and vulnerability

Abule (2005) defines pastoralism as, it is an agricultural practice involving the raring of livestock in sub-Saharan Africa where it is a dominate form of land use. Some refers pastoralist as the community which own different types of animals. On the other hand, others use the term pastoral as a reference to the rangeland and the style of living of the society who depends on livestock. Therefore, pastoral system is the

totality of all the variables (pastoralists, livestock and rangeland) which support livestock productivity such as the land, markets, wildlife conservation and households, Begzsuren (2004) and Boone (2006).

Having understanding the above definition researches, which focused on pastoral risks, have therefore advised certain consideration of the uncertainties associated with the complex components when often likely to affect the balances of the system Bolling (2006). And livestock production systems are broadly categorized as pastoral and agro pastoral areas as based on the use of land by livestock Seinfeld (2006). The prevailing biophysical and socio-cultural environment influences the choice of LPS. Based on human-environmental interaction point of view, Galvan (2004) cited in Leseeto Tera (2012) define vulnerability as □Propensity to a higher risk of negative outcomes as a result of climatic events that overwhelm the adaptations they have in place.''

Other scholar like hope (2009) is also added that further adverse effects on socio-economic status on the society which weaken the ability to respond to it and ultimately pushing them in to a poverty trap. Income and asset of livestock variability is an important measure of vulnerability in the community of the arid northern Kenya Mc peak (2004). Besides swift (1989) under lines that understanding holistic pastoral system vulnerability thus involves the testing and examination of those variables environmental, social and economic indicators. Swift (1989) is also commented that the quality and effectiveness of pastoral policy formulation and implementation can be measured its ability to reduce vulnerability on household asset which ultimately intern to translate to food security.

2.3. Pastoral system and its driver

According to Hardin (1998) the quality and productivity of rangeland is affected by the tragedy of the common, where the resources that commonly owned are over utilized. However, McCabe (1990) points out some studies which were undertaken in Kenya same years before had suggested the existence of livestock doesn't distract the productivity of the range land as the carrying capacity never exceeded by the number of livestock. Despite this reality in Kenya, many contemporary literature works on pastoral system agree on the fact and have suggested that the existence of tragedy of the commons where there is excess number of livestock owned by households in a

limited rangeland. Beyond the carrying capacity will affect productivity, Hardin (1998) and lesorogol (2008).

Retger and Reudenbach (2005) sited in plumb (2009) have developed a stimulation model to determine the carrying for arid rangeland so as to investigate the above mentioned hypothesis. And their conclusion was derived from the evaluation of the range land productivity which depends on precipitation and the available land use system in place. They conclude that the accumulation of the livestock beyond the carrying capacity of the range land creates a scarcity in the available resource necessary for primary production, Dashmukh (1984) and Campbell (2000).

Having considered the above mentioned conclusion, the disaster associated with the decline in rangeland productivity is highly linked with several causes. First of all, excess accumulation of livestock sustainably by the range land reduces the productivity of the land in the future (Blaikle, 1987 and Chen 2007). Secondly, human population increase will cause changes in land use, Garedew (2009), Jolly and Torrey (1993) and changes in government regulations, including gazettement for private ownership. Thoronton (2006), Kimani and Pickard(1998), Barett and Luseno (2006) and Doss (2005) are also forwarded other causes such as disease, draughts, insecurity and market fluctuation are often classified as abrupt occurrences. Generally, all the above factors influence both the assets and income available for pastoral households.

Barrett and mc peak (2006) reveal that major risks affecting pastoral households vary in time and space depend on environmental condition. This is to say that the seasonality of the rainfall highly influences the poverty levels in east Africa's pastoral communities. Besides Angassa and Oba (2007) also proves that rainfall causes substantial dynamics in the pastoral system especially those communities depend on direct rainfall. Aklilu and wekessa (2002), and Begzsuren (2004), states that serious draught because of lack of sufficient rainfall frequently causes high mortality rate of livestock which deteriorating farmer's income. Boone and Wang (2007), further show that transitory poverty occurs when the households are unable to meet their daily need because of insufficient income for a short period of time. Rainfall variability also affects livestock and prices on food as a result of transitory poverty. Barrett and Luseno (2004) also forward the other causes of transitory poverty which are generally referred as losses arising from insecurity, diseases and wild life predation.

2.4 Concepts and meanings of livelihood and livelihood diversification

2.4.1 Concepts and meanings of livelihood

Scholars have been for warded a number of definition about livelihoods. Chambers (1987) defines livelihoods as, sufficient and adequate stock of agricultural product and sustainable flow of cash to full fill the basic needs of the society. Chambers and Conway (1992) further elaborate this definition as capabilities, assets and activities of the society which is required for a means of living. However, these definitions are as such incomplete descriptions that unable to state and clarify how this adequate food and cash flows are generated. In this consideration, Ellis (2000) attempts to give a complete and general definition about livelihood as "A livelihood comprises the assets (natural, human, financial and social capital), the activities, and the access to these (medicated by institution and social relations) that together determine the living gained by the individual or household".

Although many scholars are stated many definitions, the most widely accepted one is chambers and Conway's (1991) definition of sustainable livelihood as;

"A livelihood comprises the capabilities, assets and activities required for a means of living: a livelihood is sustainable which can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, and provide sustainable livelihood opportunities for the next generation; which contributes net benefits to other livelihoods at the local and global levels and in the short and long run."

From the above definition, it is easy to say that livelihood will include both cash and income, the coordinated effort of all bodies (individual, family, community and institutions) and property rights to sustain a given standard of living. Ellis (1998) forwards the importance of public and social networks provided by the state such as education, health service, roads and water facility etc. which are also included in livelihoods. Taken into account the broad definition of sustainable livelihood, it comprises all the material and financial assets; capabilities through effective policies and structures activities from top down and processes in influencing the choice of livelihood strategies by the rural poor in improved standard of living.

2.4.2 The concept and meanings of livelihood diversification

Scholars define livelihood diversification in deferent context but all aim in a way to improve individual and family's standard of living. Ellis (1997) defines that it is the

process by which the rural families establish a diverse portfolio-activities and social support capabilities in their strive for survival so as to improve their entire standard of living by which the rural families establish a diverse in there strive for survival so to improve their entire standard of living. Moreover, Barrett (2001) also states the definition of livelihood diversification as an activity and process in which very few people collect all their income from any one source, keep all their wealth in the form of any single asset , or invest and use their assets in just one activity which totally makes diversification. Livelihood diversification can be seen as an attempt by individuals and households to find new ways to raise incomes and reduce environmental risk (Hussein and Nelson's, 1998).

Pastoral diversification is defined as the pursuit of any non-pastoral income-earning activity in both urban and rural environments. This includes various forms of wholesale and retail trade (e.g. selling livestock, milk, hides and skins, honey, and artisan goods etc.), rental property ownership and sales, waged employment (local and non-local, including working as a hired herder, farm worker, and migrant laborers), farming (subsistence and commercial), and the gathering and selling of wild products (e.g. gum arabic, firewood, or medicinal plants) (Little, 2001). The sale of livestock and milk products at the herd gate are not included in this definition, nor are herd diversification strategies that instigate a mix of animal species to cope with drought etc (Little 2001).

Livelihood diversification can clearly include the trend of both on-and off-farm activities which primary conducted to generate more additional income from that of the main agricultural activities. This in a sense, households can diversity their income through the production of other agricultural and non agricultural goods and services, wage from sale of labor, or self employment by starting small business activities, etc are those strategies and others which under taken to spread risk. According to Barrett (2001), farm livelihoods' income comprises both consumption-in-kind of own farm output and cash income from output sold. Off farm income refers to wages or exchange labor on other farms (agriculture). It also includes labor payments in kind, for instance the harvest share systems and other non-wage labor. And, Non-farm income refers to non-agricultural income sources such as, non- farm rural self-employment, non-farm rural wage employment, property income (rents, etc), urban-

to-rural remittances arising locally, and international remittances arising from cross-border and overseas migration (Barrett, 2001).

As Ellis (1997) definition of rural livelihood diversification, it is refers to an endeavor for survival or the need to improve their standard of living, households construct a diverse portfolio of activities and social support capabilities. They can combine a number of livelihood activities like crop production, livestock production, wage work, cottage industry, etc. to provide or supplement income. In fact, the mix of activities will depend up on the household's ability in using difference livelihood opportunities (De haan, 1999).

Taylor and wow terse (2008) suggest the importance of migrants' financial capital in the market during migration as "Household members who migrate can facilitate investment in new activities by providing liquidity, in the form of remittances, as well as income security, in the form of promise to remit to the household in the event of an adverse income shock."

This means migrant remittances can be a useful source in the case of difficulty in accessing rural credit service as they are a source of income not related to household income from agriculture which can be considered as a livelihood strategy. As an example, Lucas (1987) describes the emigration to south Africa's mines by household member from Botswana Lesotho, Mozambique, etc. He noted that emigration reduces crop production in the substance sector in the short run, but in the longer run remittance direction or indirectly improve both crop production and cattle accumulation

De haan (1999) summarizes that migration is widely believed to be a focal point for rural people's risk mitigation strategy despite little consensus and understanding on the degree how much remittances is used for rural investment. Therefore, migration though often ignored and sometimes blocked by police and governmental institution, is a very important factor of divers rural livelihoods that can contribute to improve rural livelihoods.

2.5 Classifications of livelihood strategies

The level and nature of diversification is a crucial element of any discussion on livelihoods (Murray, 2002). Ellis (2000) states that reason for diversification as a livelihood can be divided in to two overarching consideration; necessary or choice. Necessary refers to

any involuntary or desperation reasons for the need to diversifying. Examples can be decline in crop yields, reduced access to land, disaster (civil or natural) like draught, floods earth quake or civil war accident or health failure. Whereas choice can be referred as voluntary and proactive reasons for the need to diversifying and such as taking advantage of seasonal wage earning opportunities, investing on children education , saving money to invest in non-farm business, etc. Generally, Orr (2001) categorizes livelihood strategy into three broad groups

Agricultural intensification / Extensification

Those strategies vertical continued or horizontal increasing dependence on agriculture, either by intensifying the use of resource through the application of greater quantities production input for a given land, or by bringing more land for grazing or cultivation. This strategy needs household labor and capital and it depends on agro-ecological potential

Livelihood Diversification

These strategies can either be diversification by broadening of on-farm activities (e.g. adding value to primary products by processing or semi processing them), or by diversifying off-farm activities by taking new jobs. It may be undertaken by a choice for accumulation or reinvestment purposes. The former motivation could be associated with a wide income earning portfolio to offset all types of shocks and stress in the future whereas the latter would more likely be a narrower that is rehearsed response to a particular type of common stock or stress.

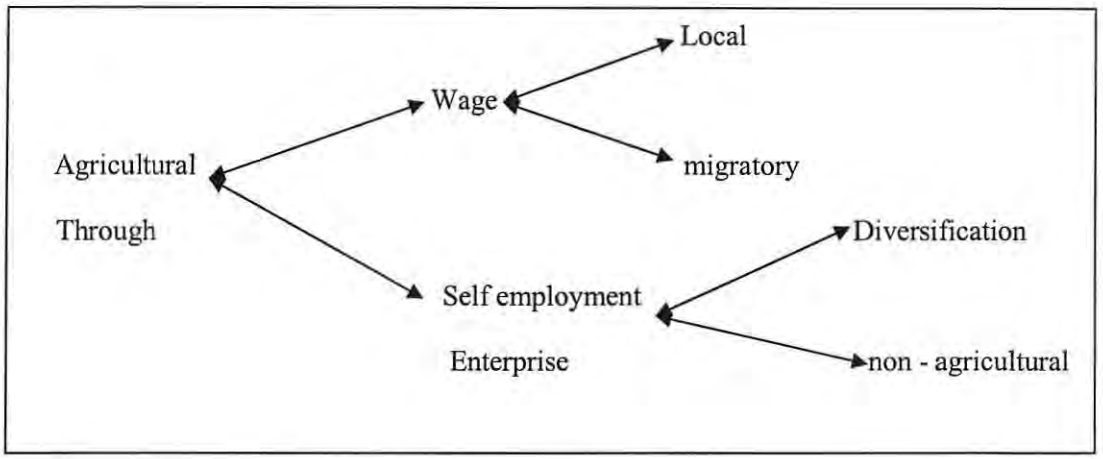
Migration

It can be voluntary or involuntary. It also just a critical strategy to ensure off-farm employment and may depend on and / or stimulate links socially and economically between area of destination and origin.

On the other hand, housein and nelson (1998) states the classification of livelihood activities in to; farm versus non-farm, on-farm versus off-farm activities, local versus migration and self employment versus wage labor

Davis (2004) states that rural non-farm economy comprises all non-agricultural activities that bring income to rural households can be classified on many dimensions such as, on-farm/off-farm, wag/self-employment, agriculturally related/ otherwise.

Based on non-agricultural activities classification in the dimension of wage /self-employment warren (2002) tries to put the following diagram;



from figure 1 wage labor refers to the provision of work force to agricultural or non-agricultural enter prices which are owned by non household employers if there is employment opportunities may be provided locally (local wage about)or in a distant areas from the pieces of residence which it can be seasonal or migration (migratory wage labor) both types of wage labor are diversification strategy which complements on farm production to meet house hold consumption needs or re-construction of impoverished farms self-employment enterprises refer to activities conducted by Mobilizing both household labor and capital assets such as savings and land these can be agricultural enterprises based on on-farm agricultural activities or non agricultural enterprises which participate on processing of agricultural commodities handicraft cottage manufacturing e t c (Warren; 2002)

According Woldhannana and Oscan (2001), the impact of wage labor and self employment are different in the rural livelihood strategy it is more Profitable for self employment through rural requires a greater risk of capital investment.

2.6. Determinants of Livelihood Diversification

Differences in resource endowments are the major influences toward diversification among rural households. These factors are labor, land, capital including access to markets and institutions. Households may vary among themselves in terms of opportunities to diversity which is determined by their asset portfolio whether the outcomes of diversification are positive or negative. These does not mean that household may have always different endowments and opportunities rather they may

have similarities in both cases, but they don't always select the same portfolio of activities. Differences occur in their choices or preferences for income, consumption, wealth and status, risk, subjective elements, (Barrett 2001). However Hussein and nelson (1998) state that, a household's ability to adopt more profitable diversification is also determined by having the skills, location, capital and social connections to pursue other activity.

A household to diversify might generally be motivated by the intension of improving household food security and income, but some of the factors which determine a household to select the actual strategies are briefly explained below.

- **Access to markets**

According to Barrett (2001), this is in the case of diversification is needed as a risk and survival strategy where the absence of markets compels households to self-provision of some goods and services through diversification.

- **Climatic variability**

Climatic variability highly affects farm production especially for those small holder farms and small hold pastoralists. Food insecurity may prompt household to diversity when there is persistent diminishing returns from agriculture. This refers that environmental uncertainty is a key motivation for diversification. This uncertainty is related to unreliable rainfall or draught which makes diversification □a farm of self-insurance" Barrett (2001)

- **Available asset portfolios**

Warren (2002) states that the availability of assets like savings, land, labor, education, access to market or opportunities and others is a major factor in determining the capability of a household to make diversification.

- **Education and skills**

Educational background is one of the major determinants of non-farm earnings. It is also highly important since the better paid local jobs require formal schooling and that there is a correlation between educations with rural non-farm business (Daviest, 2001)

- **Access to credit markets**

Access to credit and financial savings constraints can hinder acquisition of assets which are necessary to diversify out of crop farming to non-farm activities. This means credit market failures in rural livelihoods can provide another motivation for diversification (Ellis, 2000)

- **Gender relationships**

Gender relationships also shape diversification. Due to cultural constraints diversification opportunities are more open to men than women despite equal opportunities (Hussein and Nelson, 1998). This is to say that the degree of involvement in diversification activities and unfair distribution of their benefits vary and differ greatly between genders (Ellis; 2000).

- **Seasonality**

Seasonality plays a great deal affecting a household diversification on rural livelihood. This is evident through varying returns to labor time that is income which can be earned during the year in both on-farm and off-farm labor markets (Ellis; 2000)

- **Adaptation to risk**

This implies that diversification can go with on households decision making custom in accepting lower economic returns as long as there is greater security and minimum risk, (Warren ;2002).

- **Local economic boom opportunities**

According to Ellis (2000) site-specific opportunities such as development projects, infrastructure development and other local market contingencies play a considerable role in pulling rural household towards livelihood diversification. High returns to local nonfarm activities tend to occur in regions where there are booming activities in agriculture, mining, or tourism.

2.7. Constraints of livelihood diversification

According to Roth and Fratkin (2005) population pressure and ecological decline have attributed to sedentarization from the later part of 20th century. generally mobile pastoralists in eastern Africa today are becoming sedentary because of the following reason

- **Political and economic marginalization**

According to Martin.N.Shem(2010), pastoralists are marginalized because of their geographical location in remote areas, their ethnicity, and high mobility. As he stated that the greatest source of pastoralist marginalization is the outdated idea, which dominated much of the development thinking in the latter part of the twentieth century and in many areas continues today that pastoralism is an outmoded way of life that needs replacing with 'modern' livelihood systems.

Moreover he stated that □Governments in the region have historically had little economic and political interest in promoting pastoralists' interests, as they tend to see pastoralists as a 'minority vote' that isn't worth winning. In several East African countries pastoralists are relatively few in number and occupy what is considered by their governments to be marginal land with little economic potential".

Furthermore, there has been a severe lack of either public or private investment in infrastructure and economic development in arid areas, combined with poor access to markets.

- **Inappropriate development policies**

According to Martin.N.Shem (2010), for most of the 20th c, Africa was followed a range management model imported from the temperate grasslands of North America, where stable weather conditions prevail. He forwarded that □the model promotes settling communities, with bore-hole drilling, encouraging communities to cluster around water sources; and the assignment of fixed grazing lands to pastoralist communities, denying pastoralists their traditional land rights. But in Africa's dry lands, where the harsh and variable climate causes great variations in pasture availability over time and space, the model caused overgrazing and land degradation. The spatial distribution of livestock must be managed, rather than their number, in order to avoid overgrazing in arid lands, thus highlighting the critical importance of mobility in dry land resource management".

Moreover he stated that □In Kenya, the majority of the government development funds have historically been allocated to so-called 'high-potential' predominantly agricultural areas of the country. These districts have received up to ten times the

amounts allocated to the arid districts, because it was believed that they were more productive and that wealth would somehow 'trickle down' to the arid areas.

- **Population growth**

According to Elliot Fratkin (2001) the human population is growing at higher rate than the livestock population. He stated that □livestock numbers in East Africa have remained fairly constant over recent years because of disease epidemics and livestock starvation associated with floods and recurrent drought. The result is more people reliant on fewer livestock."

As a result many pastoralists cannot rely only on livestock production to provide their desired livelihood outcomes. Moreover he stated that □The continuation of successful pastoral livelihoods, and therefore healthy rangelands and ecosystems, will depend on human and livestock numbers being commensurate". This means that some pastoralists who have few livestock will have to seek alternative livelihoods as population continues to grow.

- **Conflict**

Competition on resources increases the risk of conflict among different ethnic groups in pastoral areas specially, during the times of stress, for example drought or floods. According to Martin.N.Shem (2010), conflict-mitigation institutions exist at local and national levels, with officers seconded to them from government, and there are also district peace committees. However, their effectiveness in practical early warning of conflicts and rapid response is hampered by a lack of funding and resources from government. Climate change is likely to increase the drivers of conflict in many livelihood systems, including pastoral production. Governments need to invest in suitable systems and policies now to ensure that they can meet this challenge.

- **Droughts and famines**

Drought is a normal feature of pastoral systems in Africa (Ekaya, 2001). However, within the second half of the 20th century, droughts have occurred with greater frequency. For example in the 1960s (e.g. 1960-61, 1968-69), in the1970s (e.g. 1974-76, 1979- 1981), in the 1980s (e.g. 1984), and in the 1990s (e.g. 1991- 1993, 1996), and more recently in 2000. Severe famine i.e. widespread disruption of food supply leading to starvation and emigration occurred in 1982-1984 in the horn of Africa. Historically, mobile pastoralists adapted to conditions of famine and drought or low

and erratic rainfall by physical mobility, diversification and dispersion of their herds, and seeking different food sources through fishing, hunting, and gathering. Today, mobile pastoralist are under intense pressure to adopt new options including migration to famine relief centers, urban migration for wage labour, and widespread adoption of cultivation. These options involve sedentarization in one way or another.

- **Loss of commons**

Livestock among the pastoralists are owned by an individual or a family. In contrast, land for pasture, water, minerals, etc. is usually held in common as a communal resource. Governments have tended to move away from recognizing communal land tenure in favor of individual tenure rights. In Kenya for example, the Government established group ranches in the 1960s.

Subsequently, the government promoted private and individual land titles in the 1980s. This led to a rush for purchase of land, which was pastoral grazing land. Through the establishment of game sanctuaries such as the Amboseli, Maasai Mara, Tsavo, Ngorongoro, and Serengeti, pastoralists in Kenya and Tanzania lost their former grazing lands. With this loss of common-property resources, effective pastoral mobility was curtailed. Loss of commons has immensely contributed to the sedentarization of mobile pastoralists.

2.8 Motivation for livelihood diversification

The incentives for livelihood diversification are many and diverse; so are the methods for doing so and the results and consequences.

As chambers (1997) is noted that multiple motives are suggested to prompt rural households and individuals to diversify assets, incomes and activity. These motives may include risk reduction strategy; asset accumulation strategies and response to household shocks which are classified in to two sets of motives "push and pull factors." Risk reduction, reaction to liquidity constraints and high transaction costs are included in the push factors.

Barrett (2001) also explains more from the push factor perspectives that classification is driven by limited risk bearing capacity as a result of incomplete or weak financial systems, constraints in labor and land markets, and by climatic uncertainty that create

strong incentives to select a portfolio of activities so as to stable income flow and consumption.

Reardon (1998) refers the pull factors as it is the realization of strategic complementariness between activities, and specialization due to comparative advantage given by superior technologies, skills or endowments. Barrett (2001) also states his idea from the pull factor perceptivities as; "Realization of strategic complementarities between activities such as crop-livestock integration" or "local engines of growth such as commercial agriculture or proximity to an urban area (that) create opportunities for income diversification in productivity and expenditure-linkage activities"

In the case of destination between "push" and "pull" reasons for occupational diversification, many literature works are made around this area. "Pull" reasons are correspond to the emergence of improving labor market opportunities outside agriculture, while "push" reasons refer to the deteriorating condition with the agriculture itself. Ellis (2004) put a good reason for the above symbolic language □If agriculture is lagging behind dynamic trends occurring elsewhere in the economy the pull factors are involved, and if agriculture is deteriorating relative to a static non-farm economy then push factors are involved; however, in both cases the same logic applies.

Ellis (2000) states that reason for diversification as a livelihood can be divided in to two overarching consideration; necessary or choice. Necessary refers to any involuntary or desperation reasons for the need to diversifying. Examples can be decline in crop yields, reduced access to land, disaster (civil or natural) like draught, floods earth quake or civil war accident or health failure. Whereas choice can be referred as voluntary and proactive reasons for the need to diversifying and such as taking advantage of seasonal wage earning opportunities, investing on children education , saving money to invest in non-farm business, etc.

Diversification is also described in a different language but the same context by many scholars. Block and Webb (2001), Barrett (2001) and Niehof (2004) explain the motives of diversification in a different language but reflect similar idea. Generally Niehof (2004) states the following idea as, □Diversification can be a form of coping in a situation of stress (i.e diversification for "bad" reasons) and is followed by

depletion of assets, or it can follow after building capital and is done strengthen livelihood (i.e, diversification for "good" reasons."

Hussien & Nelson (1998) also notes that many rural people in Africa do not normally specialized in livestock, crop production or fish production to the total exclusion of other income generating activities, but rather diversify their productive activities to encompass a range of other productive areas.

Many scholars state that motivation of diversification in a different context though generally it is an income generation activities in a different nature. But, it has the following common features:

- It is sometimes a means of accumulation of consumption and investment.
- It is sometimes employed to tackle the spread of risk, or to cops with crises.
- It is often employed as an adaption response for decline of income or entitlements as a result of serious economic crisis or serious environmental changes beyond the local control.
- It is often differentiated in type and degrees which is based on location , culture, natural resource, gender, age, class and culture
- It is usually structure by a wide range of motivation, restrictions and opportunities.
- It is often bound other livelihood strategies, especially agriculture intensification and migration. (hussens Nelson ;1988)

Generally scholar forwards the motives of diversification in a different context and nature. However, Hussen and Nelsen (1998) generally conclude that there are a multitude of reasons to help explain why rural people diversify which are context dependants, and that livelihood diversification can lead to both positive and negative consequence.

2.9. Positive and negative impacts of diversification

Livelihood diversification has both positive and negative impacts on agriculture. In the study, I recognize that by its very nature, livelihood diversification provides households the opportunity to increase incomes, reduce risks associated with climate dependent agriculture and consequently food security. However, as noted by Ellis (1999) diversification has both positive and negative impacts on households' way of life. These are explained below.

Positive Impacts

- **Seasonality:** which causes peaks and troughs in labor utilization on the farm may lead to food insecurity due to the mismatch between farm income streams and continuous consumption requirements. Diversification can contribute to reducing the adverse effects, by utilizing labor and generating alternative sources of income in off-peak periods. Such activities may serve as a consumption smoothing or risk insurance mechanism, particularly when the returns to these activities are not highly-correlated with agricultural returns, and may also absorb excess labor during agricultural off-peak periods.
- **Risk reduction:** Diversification enables spreading of risk across different activities whereby factors that create risk for one income source are not the same as those that create risk for another.
- **Higher income:** Diversification promotes making better use of available resources and skills (as in seasonality above), and taking advantage of spatially dispersed income earning opportunities.
- **Asset improvement:** Cash resources obtained from diversification may be used to invest in or improve the quality of household assets.
- **Environmental benefits:** Diversification can potentially provide environmental benefits by providing options that make time spent in exploiting natural resources.
- **Gender benefits:** Where activities are equally or better accessed by women, it is possible for diversification to improve the independent income-generating capabilities of women and in so doing, also improve the care and nutritional status of children.

Negative impacts

- **Income distribution** - Diversification can be associated with widening disparities between the incomes of the rural poor and the better-off. This occurs if the better-off are able to diversify in more advantageous labor markets than the poor.
- **Farm output:** Some types of diversification may result in stagnation on the home farm especially when there is lucrative distant labor markets for male labor, resulting in depletion of the labor force required to undertake peak farm production.
- **Adverse gender effects:** Where it is male labor that is predominantly able to take advantage of diversification opportunities, then women may be even more

relegated to the domestic sphere and subsistence food production. Baiphethi(2009) suggests that, one of the major impacts of livelihood diversification is feminization of agriculture, as men frequently pursue migratory labor opportunities. Consequently, women remain home to tend to home gardens and other agricultural tasks to ensure food production for the household. The empowerment of women may yield positive results as women are more likely to invest the additional income in children and family (Ellis, 1999).

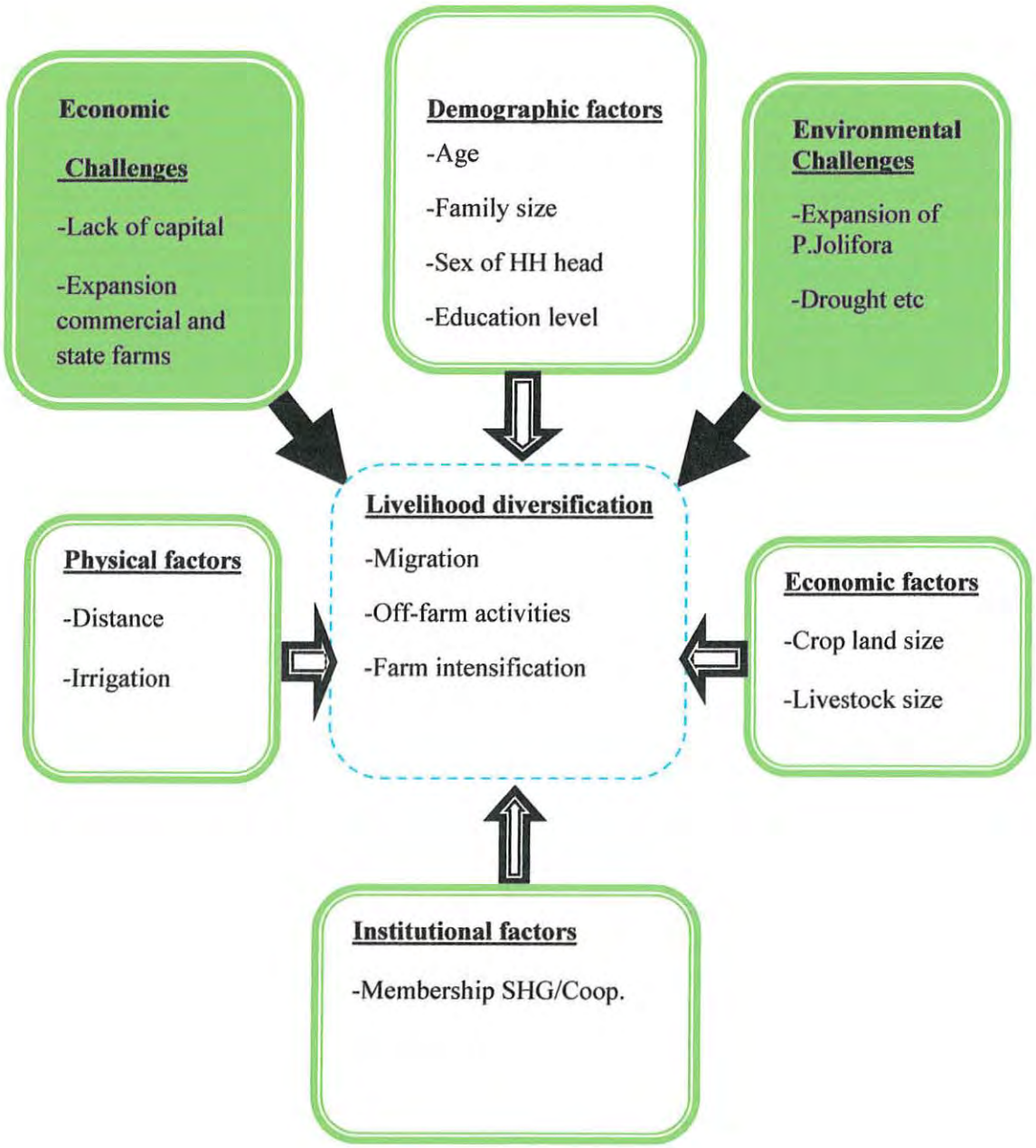
2.10. Conceptual framework

By livelihood diversification we are referring to the phenomenon where rural households engage in multiple activities (either on-farm or off-farm, agricultural or non-agricultural) in order to survive and to improve their standard of living. On-farm diversification includes the introduction of new crops into farming systems or farmers investing in livestock, hunting, and fisheries. This is distinguished from 'off-farm' activities which generally refer to activities undertaken away from the household's own farm such as wage employment on other farms (Ellis and Freeman, 2004).

People in most part of the world (rural or urban) diversify their income. They collect their income from different sources, hold their wealth in different assets or use their assets in more than one activity. This diversification patterns reflect individuals' allocation of assets to achieve an optimal balance between expected returns and risk exposure subject to constraints they face (Reardon, 1997; Barrett, 2001).

It is possible that some unobserved characteristics that influence the decision to engage in non-pastoral activities could also influence household welfare once they engage in non-pastoral activities. The basic framework is predicated on the assumption that a household's portfolio of non-pastoral activities is decided based on different determinant factors, constraints and incentives created through access to public and private resources embodied in assets, markets and institutions. In conceptualizing the determinants and challenges of livelihood diversification in pastoral households, i followed the conceptual framework below which guides this study:

Figure2- Factors that affect livelihood diversification



CHAPTER-THREE

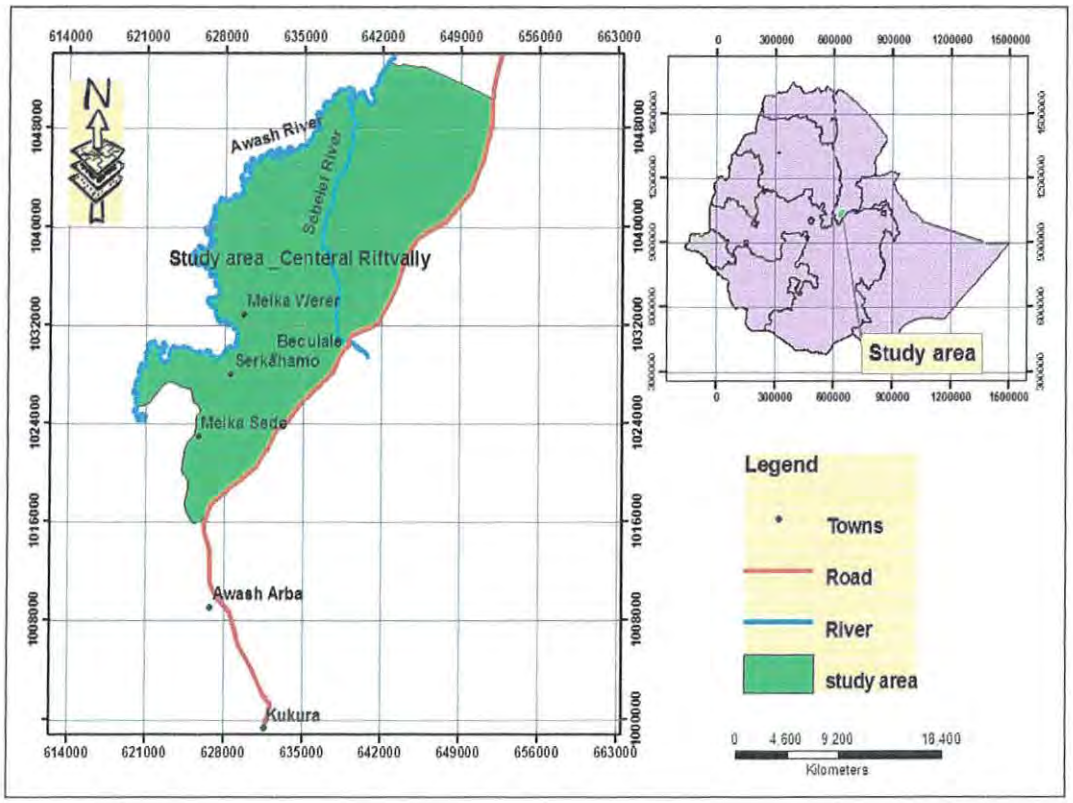
3. RESEARCH METHODOLOGY

3.1. Study site

3.1.1. Description of the study area

The study was conducted in Afar National Regional State which is found in north-eastern part of Ethiopia. The region covers around one-third of pastoral lowlands in the country and about 10% of the total area of Ethiopia (Yirgalem, 2001). The study will be carried out in Afar regional state, Gabbi resu Administrative Zone, Middle Awash, Amibara Woreda. In the woreda there are a total of 18 kebeles. Of which there are 4 urban centers and 14 Peasant Asociations. Of the 14 PAs, 4 PAs are pastoralists while, 10 PAs are Agro-pastoralists. The Awash River passes through 14 PA's out of 18 peasant associations found in the wereda. In terms of geographical reference, the district is located between 09'N to 10'N latitude and 39'45 E to 40'30E longitude (Kassa, 2001), covering an area of 285106 hectare of land (RPDO,2008). The average altitude of the district is 740 meter above sea level.

Figure-3 Description of the study area



3.1.2. Demographics

Based on the 2007 Census conducted by the Central Statistical Agency of Ethiopia (CSA), this woreda has a total population of 63,378, of whom 35,374 are men and 28,004 women; with an area of 2,007.05 square kilometers, Amibara has a population density of 31.58. Out of the total population in the woreda 35,241or 55.6% live in rural parts, While 28,137 or 44.40% are urban inhabitants. In the wereda 6,555 or 10.34% are pastoralists while, 28686 or45.26% are agro-pastoralist. A total of 13,729 households were counted in this woreda, which results in an average of 4.6 persons to a household, and 14,773 housing units. The pastoralists in Amibara Woreda spend most of the wet season in Allaideghe plain where all the Afar clans evacuate their livestock for grazing and in dry season along Awash river bank. The livestock populations of the Amibara Woreda are composed of 103, 959 cattle, 122,526 goats, 48,043 sheep, 3,888 donkeys and 39,995 camels (CSA, 2005).

3.1.3. Climate

Like those other low lands of Ethiopia, Amibara Woreda is characterized by high temperature and low and erratic precipitation. The mean annual temperature of this area is 27.6°c and the mean maximum temperature reaches 39°c in June whereas, the mean minimum temperature is 15°c in November (Figure 3).The wettest season of the area is in between July (122 mm rainfall) and August (118 mm rainfall), but the mean maximum and mean minimum rainfall are 122 mm and 6 mm in July and December respectively (Figure 2). The mean annual relative humidity ranges from 40% in June to 59% in August indicating that June is the hottest month and August is the wettest month of the study area (WAS, 2006). The area has the mean annual total rainfall of 564.4 mm while the mean evapo-transpiration is estimated to be between 1400 and 2200 mm per annum for the last 35 years (MOA, 1997).

May and June are the driest months of the year and locally called "Hagay" which is unsuitable for browsing since bushes dry up except *P. juliflora*. The main rainy season called "karema", which accounts for about 60% of the annual total rainfall, is from July to September. This is followed by best grazing season that occurs from September to November. Another minor rainy season appears during March and April, which account for 20% of the total rainfall. November to March is less severe dry season with relatively cool temperature.

3.2. Research design

3.2.1. Sampling techniques

The first step in the sampling procedure was the selection of kebeles. Given the focus of the Study on pastoral livelihood strategies, emphasis was given to pastoral and ago-pastoral kebeles. Accordingly, from the 18 Kebeles found in the wereda, four were excluded from the sampling, as they were urban centers.

In this study multi-stage stratified proportional random sampling was used. Fist, Amibara woreda was selected purposely because of its relative livelihood diversification as compared to other weredas. Next the woreda was stratified in to two stratums namely, 4pastoralist (PAs) and 10 agro-pastoral (PAs). Three PAs were selected among 14 rural PAs found in the woreda by using proportional random sampling procedure. Bonta and Badahamo PAs was selected among the 10 agro-pastoral PAs representing agro-pastoral livelihood, whereas, Halaydagy was selected representing pastoral livelihoods. Then the households in each kebele/villages were stratified by wealth strata. The community criteria were used in the sampling stratification of pastoral households. The status of wealth among the pastoralists in the study area is measured by the size of cattle ownership. Finally a proportional random sampling procedure was followed to draw 100 households.

Table-1 Sampling procedure used in the study

NS	PAs	Popn	Proportion of wealth status within each PAs			Sampled HH per wealth strata			Sampled HH per PAs
			W. %	Av.%	Poor %	W.	Av.	Poor	
1	Bonta	3577	14	54.4	31.6	8	31	18	57
2	Badaham	1917	6.7	53.3	40	2	16	12	30
3	Halaydgy	810	53.8	30.8	15.4	7	4	2	13

Sample size determination

Appropriate sample size depends on various factors relating to the subject under investigation like the time aspect, the cost aspect, the degree of accuracy desired, etc (Gupta and Gupta, 2002; Rangaswamy, 1995). If sample is too small, we may fail to achieve the objectives of our analysis. But if it is too large, we waste resources when we deal with the sample. Sample error will arise because we have not studied the

whole population. Whenever we sample, we always miss some helpful information about the population (Levin, 1989; Kothari, 1990). The higher the desired precision or the level of confidence, the larger (more costly) will be the sample (Browen and Starr, 1983). Sampling theory is of little help in arriving at a good estimate of the sample size in any particular situation (Gupta and Gupta, 2002).

The sample size required to perform reliable estimations with the binary logistic regression method varies with the number of independent variables. The more independent variables you have, the more cases are needed. Garson (2009) refers to recommendations of 10 cases per independent variable. Hence, the researcher identified 10 (ten) independent variables that determines household livelihood diversification in the study area. Therefore a total of 100 households were surveyed.

3.2.2. Methods of data collection

Both primary and secondary were used in this study. Primary data on household socio-economic characteristics were collected from sample households using structured questionnaire. The data collection was conducted with trained enumerators who are capable of speaking the local language. Enumerators administered the questionnaire with the close supervision of the researcher. Focus group discussions and key informants interview were also carried out in order to get better ideas of the socio-economic context, using a guiding checklist to complement the data collected using the questionnaire. One FGD were held in each kebeles with four social groups namely, clan leaders, elders, women, and youths. And key informant interview were conducted with Kebele administration, various experts in Amibera wereda pastoral and rural development office, Director of werer research institute and development agents. Secondary information was also collected from various published and unpublished sources. Different documents of agricultural schemes and regional level reports and consultants' reports as well as Central Statistics Authority publications were reviewed to gather relevant information.

3.2.3. Data analysis

The data obtained was analyzed using descriptive statistics and logit regression analysis. The descriptive statistics was used to present the result of the socio-economic characteristics of the respondents. Statistical tools like tables, frequency, percentages, and mean were used to summarize the data. Chi-square and t-test tests

were also used to identify the existence of significant relationship for quantitative and qualitative data, respectively. Chi-square test was used for nominal characteristics that can be represented by non- numerical categories, such as sex, membership in formal organization, and access of irrigation water. It was also used to identify the existence of significant relationship among different wealth groups in level of diversification. For quantitative data, a t-test that compares the means of two groups was used. One-way ANOVA was used to compare mean number of non-pastoral economic activities undertaken by different wealth groups. Logit regression analysis was used to determine the factors influencing livelihood diversification among pastoral households in the study area

3.3 Definition of variables and working hypothesis

3.3.1. Dependent variable

This study explores the main factors that affect the pursuit of supplementary or alternative livelihood strategies at household level with a particular focus on livelihood assets. Therefore the dependent variable of the model for this study is diversification status by the households. Logistic regression was used to estimate the probability of livelihood diversification. Households who were not engaged in non-pastoral economic activities are considered as (not diversified = 0) households who were engaged in one or more non-pastoral economic activities were considered as (diversified =1).

3.3.2. Definition of Independent Variable

The explanatory factors in the binomial regression of pastoralist activity choice could be categorized as household level attributes which include household demographic characteristics, asset endowments, and access to opportunities represented by distance. These are represented by the explanatory variables of sex of the household head (SEXHEAD), age of the household head (AGE), household size (HHSIZE), dependency ratio (DEPRAT), wealth status (STOCKSIZE), level of education (EDUCATION) and distance from the nearest town (DCENTRE).

Age – Since in a rural society livelihood decisions are mostly taken by a household-head, we have considered the age of household-head only and it was hypothesized that the household with a younger head will have higher desire and access to non-farm activities.

Sex of the head- sex of the head also considered as the main determinant variable for diversifying livelihood. Gender is an integral and inseparable part of rural livelihoods. The assumption is that male headed households provide the majority of agricultural labor and is sole decision maker concerning agricultural activities. Male dominate agricultural activities and engaged more in diversified livelihood activities. The relationship between livelihood diversification and sex of the head is hypothesized to be positive.

Dependency Ratio – Dependency ratio refers to the ratio of inactive family members (under 14 and over 64 years of age) to active family members (between the ages of 18 and 64).It is the ability of a household to meet its subsistence needs and as dependency ratio Increases, the ability to meet household needs decreases and probability of diversifying livelihood to non-farm activities increases. Therefore, the relationship between livelihood diversification and dependency ratio was hypothesized to be positive.

Education – To capture the effect of education, the average education of all the members in a household was considered. The relationship between livelihood diversification and education was hypothesized to be positive

Family-size – Family size is an important factor for livelihood diversification. Reardon (1997) had observed that family size affects the ability of a household to supply labor to the farm. In a large family some members could remain engaged in traditional farming while others could opt for non-farm activities. It will also reduce the risk of livelihood failure. We therefore hypothesized a positive relationship between livelihood diversification and family size.

Distance – Geographic variables are also important determinants of livelihood diversification. Proximity to market or town has a significant influence on livelihood diversification and increases the prospects of non-farm employment for the rural households. Thus, the relationship between livelihood diversification and distance to the nearest town was hypothesized to be negative.

Livestock (LV) are usually linked with farming activities. With an increase in livestock sizes and their values, it is expected that they will either be utilsed in more intensive farming activities or the increased income earned from a larger livestock

might lessen the drive to higher diversification status. Consequently there is likely to be a negative relation between livestock size and diversification status.

Farm size - Farm size is an important factor for livelihood diversification. As a farm size increases the productivity will increase and output per hectare will increase while; production cost per hectare will decreases. Hence, households who have large farm could earn high income from the sale of their agricultural products and they will have the ability to engage in small business enterprises. We therefore hypothesized a positive relationship between livelihood diversification and family size.

Irrigation – In the study area some of the pastoralists cultivate their crops using seasonal rain while, some of them have access for irrigation water. Irrigation opportunities make multiple cropping possible which will create agricultural surplus. This surplus can be used for doing non-farm activities, particularly self-employment activities. So we hypothesized the relationship between livelihood diversification and access for irrigation to be positive.

Participation in /membership in committee activities – Membership of a formal social organization like Self-help Group (SHG)/co-operative/ village committee, etc. is an important social capital in determining livelihood diversification. Membership of a SHG elevates his/her social status and increases access to common property resources as well as different government/NGO schemes. Therefore, we hypothesized a positive relationship between livelihood diversification and membership of social organization.

Logistic Model Specification

Logit Model was used to determine the factors influencing livelihood diversification among pastoral households in the study area. Recently specification of the logit or other econometrics models became irrelevant due to the fact that the advancement in software development reduced the painstaking work of the manual derivation of the various econometric formulas. However, to make aware of the readers of this study, the logit model specified following the book of Gujarati (2004) as follow:

$$Pi = E\left(Y = \frac{1}{Xi}\right) = \frac{1}{1 + e^{-(\beta_0 + \beta_1 X_1 + \beta_2 X_2 .. + \beta m X m)}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 1$$

Since, $Zi = \beta_0 + \beta_1 X_1 + \beta_2 X_2 .. + \beta m X m$ the above formula can be rewrite as shown below for easy of understanding.

$$Pi = \frac{1}{1+e^{-zi}} = \frac{e^{zi}}{1+e^{zi}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 2$$

The above formula indicates that as the value of Z_i ranges from negative infinitive to positive infinitive Pi the probability of households' decision to engage in various livelihood activities ranged between 0 and 1.

Therefore, when (Pi) is the probability of households to engage in alternative livelihood options, (1-Pi) then will be the probability of households who are limited only with single traditional pastoral livelihood strategies.

This can be represented as:

$$1 - Pi = \frac{1}{1+e^{Zi}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3$$

Now the most important element in the logistic regression is the odds ratio that can obtained from equation (3) which is represented as $\frac{Pi}{1-Pi}$ as show in the following expression:

$$\frac{Pi}{1-Pi} = \frac{1+e^{Zi}}{1+e^{-Zi}} = e^{Zi} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 4$$

The odds ratio in logistic mode shows the extent or degree of favoring the households to have alternative livelihood strategies.

When we take the natural logarithm of equation (4), we can obtain the following formula for logit model which mostly represented as Li:

$$Li = \ln\left(\frac{Pi}{1-Pi}\right) = Zi = \beta_0 + \beta_1 X_1 + \beta_2 X_2 .. + \beta m X m \ldots\ldots\ldots\ldots\ldots\ldots 5$$

Then if the disturbance term Ui is taken in to account the logit model becomes:

$$Zi = \beta_0 + \sum_{i=1}^{m} \beta i X i + Ui \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 6$$

Where:

β_0= the intercept. It is the value of the log odd ratio $\frac{Pi}{1-Pi}$, when X or explanatory variable is zero.

$\beta_{1=}$ the slope, measures the change in L (logit) for a unit change in explanatory variables (X)

CHAPTER-FOUR

4. Results and Discussion

4.1. Demographic and Socio-economic Characteristics of the Sample Households

From 100 respondents interviewed 78 % of the households have diversified and 22 % have not diversified their livelihood in to non pastoral economic activities. The demographic and socio-economic characteristics of diversified and not diversified households are discussed in this section.

4.1.1 Demographic characteristics of the sample households

Table 2 summarizes the results of the socio – economic characteristics of the pastoral households. Demographic and socio-economic characteristics of the pastoral households are important factors directly and indirectly determining the extent of livelihood diversification in the study area. These include age, gender, farm size, average educational level of the family, household size among others and the results were summarized in table below.

Gender is an integral and inseparable part or rural livelihoods. As the table shows that 74% of the respondents were male. Out of diversified households 79.5% of the respondents were male and only 20.5% of the respondents were female. This is a clear indication that males are engaged nearly four times more in diversified livelihood activities in the study area than female.

Marital status is an important factor determining the extent of livelihood diversification. Households that are married are more likely to have diversified income portfolios than unmarried farmers. This is due to the fact that married household heads have more responsibility than the unmarried ones. 84.6% of pastoral households were married showing that majority of the respondents were married and have families to cater for.

The level of education of farmers is assumed to influence the level of awareness and ability to adopt innovation. It is also believed by some school of thought that the more education pastoralist has; the more likely he is to work non-pastoral activities. As shown from the table above 81.81% of the not diversified households had an average education level between 0-5years, 18.19% had between6-8years of education, and none of the households had education level 8years of education. Whereas, 57.7% of

the diversified households had an average education level between 0-5years, 41% of the households had between 6-8 years of education. From the table above, it is seen that the literacy level of not diversified pastoral households were relatively low in the study area.

Table2. Demographic characteristics of the sample households by diversification status

Characteristics	Diversified(n=78)		Not diversified(n=22)		Total(n=100)	
	Frequency	Percent	Frequency	Percent	Freq.	Per
Gender:						
Male	62	79.5	12	54.54	74	74
Female	16	20.5	10	45.46	26	26
Marital status:						
Married	66	84.6	15	68.18	79	79
Single	7	9	4	18	11	11
Divorced	1	1.3	1	4.5	2	2
Widowers	4	5	2	9.3	6	6
Education level						
0-5years	45	57.7	18	81.81	63	63
6-8years	32	41	4	18.19	36	36
9 & above	1	1.28	0	0	1	1

Source- Own survey result (2014)

In terms of age, diversified households were younger in age than those not diversified. It is generally accepted that younger pastoralists are more innovative than the older ones. Mean age of diversified household was 41 years and of not diversified was 53.5 years. The average age of not diversified is larger by 12.5 years over the diversified

households. The age structure of the diversified household show that the largest proportion of the respondents, 65 % were in the age group of 16 to 45 years.

Household's size also has both positive and negative effect on output. For instance, a larger household's size may depend on more income generating activities for sustainable livelihood than a smaller household's size. The average household size of sample respondents was 5.83 and for diversified was 6.08, and the not diversified was 4.95 persons. The average household size shows a difference between diversified and not diversified households. More than 72% of the not diversified had family size of less than 5 whereas, 59% of diversified households had a family size between5 to 12.

Table3. Mean distribution of sample pastoral household by age and family size

Characteristics	Diversified(n=78)				Not diversified(n=22)			
	Min	Max	Mean	St.dev.	Min	Max	Mean	St.dev.
Age	16	82	41	14.793	16	73	53.55	14.34
Family size	1	12	6.08	2.075	3	9	4.95	1.558

Source- Own survey result (2014)

4.1.2 Socio-economic Characteristics of the Sample Households

Cotton and maize is the principal cash and food crop respectively in the study areas. The mean crop land size for diversified households were 1.65 hectare and 0.95hectar for those not diversified. Out of respondents 70% were grown cotton and 30% of the respondents were grown maize.

Animal rearing is the major component of the farming systems of the study areas. The sample farmers rear livestock for various purposes including meat, milk, eggs production, draft power and others. Sheep and goats are mostly sold when farmers need cash to buy improved seeds, food for the family and clothes for children. The mean livestock ownership for diversified pastoral household was 17.716 TLU and for not diversified was 25.01 TLU.

Table4.Mean distribution of sample pastoral household by crop land holding and TLU

Characteristics	Diversified(n=78)				Not diversified(n=22)			
	Min	Max	Mean	St.dev.	Min	Max	Mean	St.dev
Crop land (ha)	0	5	1.65	1.115	0	4	0.95	1.253
Livestock in TLU	0	32.5	17.71 6	6.432	6	48	25.01	11.053

Source- Own survey result (2014)

4.1.2.1 Wealth status of sampled households

In Amibara pastoral community peoples are categorized in to different wealth groups such as, the Better-off (Gadali), the average (Tudagoyta), and the poor (Aydidu).

According to woreda pastoral, agricultural and rural development office, in Badahamo 40% of the households are poor, 53.3% are the average while; only 6.7% of the households are the Better-off. In Bonta 31.6% of the households are poor, 54.4% are the average while, only 14% of the households are the Better-off. In Halaydegy 15.4% of the households are poor, 30.8% are the average while, the majority of the households 53.8% are the Better-off.

Table5-Wealth status in different peasant associations-cross tabulation result

Wealth status (%)	**Bonta**	**Badahamo**	**Halaydegy**	**Total**
Poor	31.6	40	15.4	32
Average	54.4	53.3	30.8	51
Better-off	14	6.7	53.8	17
X^2/P-values	15.489/ 004***			

*** - Significant at less than 1% probability level

According to key informants and focus group discussion participants in the three communities, livestock size, family size, and crop land size are the major wealth indicators in the study area.

The households with an average have 30 camel, 50 cattle, 40 sheep/goats, more than 6 household size, and more than 2 hectares of crop land are considered as the better-off

(Gadali); the households who have an average of 8 camel, 10 cattle, 15 sheep/goats, household size of 4, and crop land size of 2 hectares are considered as the average(Tudagoyta); and households with an average have 2 camel, 3 cattle, 10 sheep/goats, 3 household size, and 1hectars of crop land are considered as the poor (Aydidu). Accordingly, in the study area the majority (51%) of the sampled households are middle class. The poor and the better-off constitutes 32% and 17% respectively.

Table6- wealth indicators in the study area (average values)

Indicators	Rich	Average	Poor
Number of camel	30	8	2
Number of cattle	50	10	3
Number of sheep/goat	40	15	10
Family size	More than 6	4	3
Size of crop land owned	More than 2hectar	2hectar	1

The better-off pastoralists are mostly involved in livestock production and crop production; the average wealth category is mostly involved in alternative livelihood strategies such as, crop production, permanent employment, and peaty trade; the poor households are mostly involved in alternative livelihood strategies such as, wage labor, and sale of wood & charcoal.

Figure 4-Proportion of sampled households by wealth class

4.2. Diversification status and types of livelihood strategies.

4.2.1. Diversification status of sampled households

As table 7 shows that 78% of the respondents adapted one or more non pastoral economic activities whereas, 22% of the respondents were unable to pursue alternative livelihood strategies.

Table7. Diversification status of the sampled pastoral households

No. of non-pastoral eco. Activities	Diversification status	Code	N	Percent
1or more	Diversified	1	78	78
0	Not diversified	0	22	22
	Total		100	100

Source- Own survey result (2014)

In terms of the number of livelihood strategies undertaken by pastoral households, 22% of the households were not engaged in any non-pastoral economic activities, 50% of the respondents were engaged in 1&2 non-pastoral economic activities, and 28% of the respondents were engaged in 3 or more non-pastoral economic activities.

Table-9 below summarizes diversification status at peasant association level. Among the respondents in Badahamo peasant association 86.66% of them were diversified, in Bonta kebele 80.7% of them were diversified, and only 46% of the respondents were diversified in Halaydegy kebele.

Table8. Diversification status by Peasant associations

Diversification status	Bonta		Badahamo		Halaydagy	
	Freq.	percent	Freq.	percent	Freq.	percent
Diversified	46	80.7	26	86.7	7	46.14
Not diversified	11	19.3	4	13.3	6	53.84
Total	57	100	30	100	13	100
X^2/P-values 9.23/0.10**						

** - Significant at less than 5% probability level Source- Own survey result (2014)

The cross tabulation result above shows that among the poor wealth groups 90.6% of them were diversified households, 82.4% of the average wealth groups were diversified, and among the better-off households only 41.2% of them were diversified. This shows that most of the poor & the average households are engaged in different non-pastoral low waged economic activities to escape from poverty while, most of the better-off households stay on traditional livestock production.

Table9- Diversification status of different wealth groups

Wealth status	Diversified (%)	Not diversified (%)	Total
Poor	90.6	9.4	100
Average	82.4	17.6	100
Better-off	41.2	58.8	100
X^2/p-value 16.969/0.001			

*** - Significant at less than 1% probability level

4.2.2. Livelihood strategies undertaken by pastoral households

4.2.2.1. Traditional livelihood strategies undertaken by pastoral households

Most households were undertaking traditional livelihood strategies. As shown in table (see table 9) livestock keeping encountered (89%), sale of livestock (77%), sale of milk (25%) and trade in livestock encountered (16%).

Table10: Traditional livelihood strategies undertaken by sampled pastoral households

Livelihood strategies	**Frequency***	**Percentage%**
Livestock keeping	89	89
Sale of livestock	77	77
Sale of milk	25	25
Trade in livestock	16	16

*Frequencies are out of 100 households Source: Field data collected for this study

4.2.2..2. Alternative livelihood strategies

This study found that pastoral households had diversified their livelihood strategies into non-pastoral economic activities such as, crop cultivation, make & sale of charcoal, sale of wood products, leasing out of crop land for investors, share from clan land, peaty trade, remittance, wage labor, formal employment, etc

Table11- Alternative livelihood strategies undertaken by sampled pastoral households

S.N	Livelihood strategies	Frequency*	Percentage%
1	Crop cultivation	42	42
2	Share from clan land rent	51	51
3	Renting of private crop land	35	35
4	Wage labor in the farms	41	41
5	Formal employment	17	17
6	Remittance	14	14
7	Peaty trade	9	9
8	Sale of charcoal and fuel wood	7	7
9	Bee keeping and sale of Haney	1	1
10	Others	2	2

Crop cultivation

As reveled in the table above 77% of sampled households has a plot of crop land. But only 42% the sampled households cultivate food crops such as maize for subsistence; and cash crops such as cotton for sale. The remaining 35% of the respondents rent their crop land for privet investors. Out of those who adapt crop cultivation 60% the households cultivate their crop by share cropping while the other 40% cultivate either by their own labor or by employing laborer. Pastoralists in Amibara use irrigation water for cultivation. 13% of the poor wealth group, 15.7% of the average, and 9.4% of the better-off wealth groups were cultivate crops.

Charcoal and Fuel Wood

Fuel wood and charcoal selling is one of non-pastoral, non-farming activities undertaken by pastoralists in the study area. As reveled in the table above, 7% of the respondents make and sell charcoal and fuel wood as an alternative livelihood ›tegies. Charcoal-making and selling as well as collection of fuel wood for sale is

predominantly undertaken by male, as the activity requires hard labor. Both fuel wood collection and charcoal making are illegal although they used Prosopis Juliflora: locally known as "datahada" for the purpose; which is an expansive weed which is harmful for livestock and major cause of range land degradation in most part of the study area. 3.5% of the poor wealth group, 0.6% of the average, and 4% of the better-off wealth groups were participate in sell of wood & charcoal.

Waged labor

As indicated above, wage employment was one of the important subsidiary economic activities for the sampled households. The result indicates that 41 % of the households derive a portion of their income from such employment. The farm schemes in the study area mainly produce cotton for domestic industries as well as for foreign markets. Though the farms are partly mechanized, they provide employment opportunities to substantial numbers of waged labor. 28.5% of the poor, 9% of the average, and 4% of the better-off wealth groups were participate in waged labor.

Share from clan land rent and Renting of private crop land

Share from clan land rent and Renting of private crop land for privet investors are one of the most common alternative livelihood strategies in the study area. Clans rent their communal lands to commercial farms and each household within the clan will earn income. Some pastoral households also rent their Private crop land for privet investors. The local people rent their communal and private land because of lack of initial capital. According to FGD participant in Badahamo community at least 3,000 birr per hectare at initial phase is required to cultivate crop. There for most of them could not acquire this amount of money. As a result most of the pastoralists prefer to rent their clan and private lands to commercial farms.

The result indicates that 51% of the respondents have earn a portion of their income from clan land rent, and 35% of the respondents earn income from renting their own privet land. 13% of the poor wealth group, 20.5% of the average, and 8.1% of the better-off wealth groups earn income from rented clan lands. And also, 14.2% of the poor wealth group, 14.4% of the average, and 8.1% of the better-off wealth groups rent their privet crop lands for privet investors.

Remittance and Peaty trade

Remittance and Peaty trade (such as, sell of chat) are one of the livelihood strategies undertaken by the pastoral households across all wealth groups. 14% of the sampled households and 9% of the sampled households involved remittance and peaty trade respectively. 2.3% of the poor wealth group, 6% of the average, and 4% of the better-off wealth groups were participated in remittance. And 4.7% of the poor wealth group, 3.4% of the average, and 2.7% of the better-off wealth groups were participate in peaty trade.

The table below shows the one-way ANOVA result that confirms there is a significant difference in a mean number of non-pastoral economic activities between different wealth groups at less than 1% probability level. The mean number of non-pastoral economic activities undertaken by the poor, Average, and Better-off is 2.50, 2.10, & 1.12 respectively.

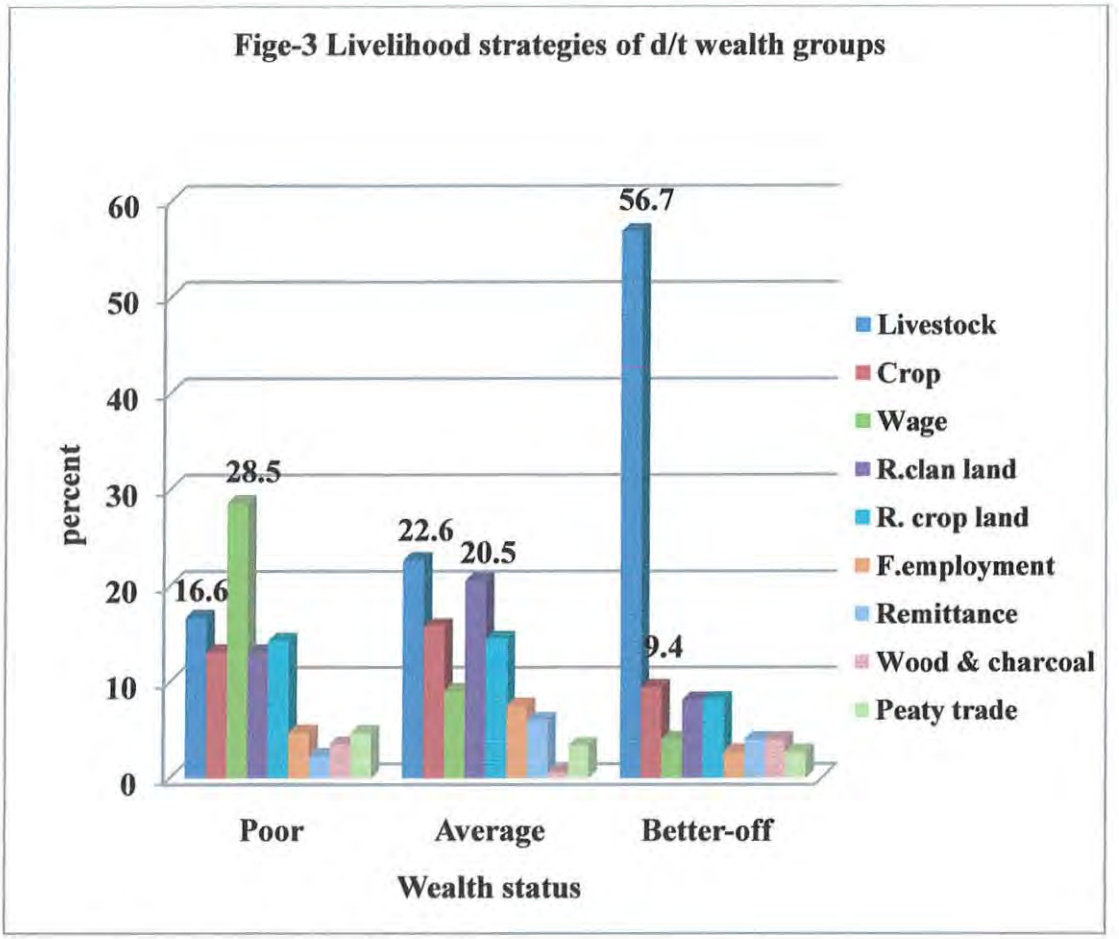
Table12-Mean number of livelihood strategies undertaken by various wealth groups

Wealth status	Mean	Std.dev	F	P-value
Poor	2.50	1.295	6.805	0.002*
Average	2.10	1.285		
Better-off	1.12	1.054		
Total	2.06	1.324		

Note: *, denotes significance level at less than 1%

As shown in the figure-2 the poor wealth groups are mostly involved in wage labor. About 28.5% of the poor households are involved in waged labor in commercial farms. The average wealth group is mostly involved in livestock production (22.6%), followed by Renting of clan lands (20.5%). While, the majority of Better-off wealth group (56.7%) is involved in livestock production. And only 9.4% of the better-off households involved in crop production (9.4%).

This shows that livestock production was the most important livelihood for the better-off households and for the Average households, and wage labor for the poor households.



Source- Own survey result (2014)

4.3. Factors that affect livelihood diversification

Logit Regression Model was used to determine the factors influencing livelihood diversification among pastoral households in the study area. It is used to model dichotomous variables. It is a non-linear regression model that forces the output (predicted) values to be either 0 or 1. It is also used when dependent variable is binary (have two possible values).

The dependent variable is a dichotomous variable with an expected value of one indicating pastoralists participate in one or more non-pastoral economic activities (diversified) and 0 if not.

Before using logit model for hypothesized variables, it is necessary to test the problem of multicollinearity or association among the potential independent variables. Bivariate correlation analysis was used to see the degree of multicollinearity among ten independent variables.

4.3.1 Descriptive statistics of livelihood diversification

To show the presence of significant statistical association and mean difference between diversified and not-diversified households, both t-test and chi-square test were employed.

Table 12 provides the summary of the differences in the mean difference of continuous variables hypothesized to influence livelihood diversification. The differences in the mean values of the continuous variables for the two groups were assessed by using an independent t-test. The t-test allows predicting the potential power of the variables that influence livelihood diversification in the study area. As Table shows, the continuous variables hypothesized to influence livelihood diversification in the study area, the difference in the mean values of all variables were statistically significant. More specifically, the differences in the mean values of age of the household head, tropical livestock unit, average education of the household in year and distance from the nearest town were found to be significant at less than 1% probability level; and family size and farm size at less than 5% probability level.

The mean age difference between diversified and not diversified is found to be statistically significant. This finding is in complete agreement with the a priori expectation. Pastoralists who are old are supposed to be more conservative and usually prefer to stay with their traditional livelihood strategies.

The mean household size difference between diversified and the not diversified are statistically significant. This finding is in agreement with the a priori expectation. A household size was assumed to increase pastoralists' ability to pursue alternative livelihood strategies.

The mean farm size difference between the diversified and not diversified is statistically significant. This finding is in agreement with the a priori expectation. Adequate size of land holding was assumed to increase pastoralists' ability to pursue alternative livelihood strategies

The mean education level of the family difference between diversified and the not diversified are statistically significant. This finding is in complete agreement with the a priori expectation. A household level of education was assumed to increase pastoralists' ability to pursue alternative livelihood strategies.

Table13. Means, St. Dev. and t-values of continuous variables for diversified and Not diversified pastoral sample household

Characteristics	Diversified (n=78)		Not diversified(n=22)		T-value	Sig.
	Mean	St.div.	Mean	St.div.		
Age	41	14.793	53.55	14.34	3.536*	0.001
Family	6.08	2.075	4.95	1.558	-2.353**	0.021
Farm	1.65	1.115	0.95	1.253	-2.592**	0.013
Livestock	17.7	6.4	25	11	3.9*	0.000
Education	5.151	1.458	3.909	1.849	-3.319*	0.001
Distance	10.88	2.455	12.55	2.841	2.706*	0.008
Dependency	0.700	0.457	1.001	0.725	2.374**	0.020

*, **- Significant at less than 1% & 5% respectively

The mean difference in TLU between diversified and not diversified is found to be statistically significant. This finding is in complete agreement with the a priori expectation. Pastoralists who have large tropical livestock unit are less likely to participate in alternative livelihood strategies than those who have small tropical livestock unit.

The mean difference of distance from the nearest town between diversified and not diversified is found to be statistically significant. This finding is in complete agreement with the a priori expectation. Pastoralists who are far from the town are less likely to participate in alternative livelihood strategies than those who are nearest to towns.

Furthermore, the mean difference in dependency ratio between diversified and not diversified is found to be statistically significant. This finding is in agreement with the a priori expectation. Households with high dependency ratio are less likely to participate in alternative livelihood strategies than those who have small dependency ratio.

In a similar manner, Chi-square ($\chi 2$) test is used to assess the potential power of the discrete variables that determine livelihood diversification and the results of the test are presented in table below

Table 13 shows the three discrete variables, hypothesized to influence livelihood diversification in the study area, such as Gender, accessibility of irrigation water and membership in formal organizations. Differences between diversified and the not diversified were statistically significant except, irrigation. The result of gender and membership is in complete agreement with the a priori expectation.

Table14. Frequency and $\chi 2$ values of discrete variables for the two groups

Characteristics	Diversified (n=78)		Not diversified(n=22)		F/X^2	Sig.
	Frequency	Percent	Frequency	Percent		
Sex: Male	62	79.48	12	54.54	23.040 (df=1)	0.000*
Female	16	20.51	10	45.46		
Irrigation: Yes	47	60.3	11	50	2.560 (df=1)	0.110
No	31	39.7	11	50		
Membership: Yes	32	41	6	27.3	5.760 (df=1)	0.016**
No	46	59	16	72.7		

*, **-Significant at less than 1% & 5% respectively Source- Own survey result (2014)

As the table shows that 79.48% of the diversified and 54.54 % of not-diversified are male headed households with a chi-square result X^2 (1, N=100) = 23.040, p =0.000 which implied the presence of statistically significant difference between diversified and not-diversified in terms of the sex of household heads. Additionally the result indicated that being male household head has a positive association on livelihood diversification. This implies that male households have more opportunities to engage in different income generating activities as compared to the male counterparts.

The table also illustrates that 41% of the diversified and 27.3% of the not-diversified households had membership in formal organization with a chi-square result X^2 (1, N=100) = 5.760, p =0.016 which implied the presence of statistically significant difference between diversified and not-diversified in terms of membership in formal organization. Additionally the result indicated that being membership in formal organization has a positive association on livelihood diversification.

4.3.2 Multicollinearity diagnosis

Multicollinearity or singularity may occur with highly redundant predictors, making matrix inversion impossible. Analysis of data with the presence of collinearity among predictors may give unreliable results. Hence, we need to check the presence of multicollinearity before proceeding to the analysis. Some of the appropriate methods for assessing multicollinearity are variance inflation factor (VIF) and Condition index. See Appendix 2

Variance Inflation Factors (VIF) greater than 10 are generally seen as indicative of severe multicollinearity. The 1/VIF column is the tolerance and it ranges from 0 to 1, with 1 being the absence of multicollinearity. In our case all of the VIFs are below 2 and all of the tolerances are close to one indicating that there is no problem of multicollinearity in our data. Similarly, from the eigenvalues and condition indexes no severe problems of multicollinearity were noted except for the last two variables (Irrigation and membership). As a rule of thumb a condition index below 15 is indicative of the absence of multicollinearity problem (Gujarati, 1988). Significant collinearity is present if the condition index is >15, and if the condition index is greater than 30, then sever collinearity is existed (Vijay Gupta 1999). Based on condition index results in Apendex A, two variables namely irrigation and membership in formal organization has a multicollinearity problem. Therefore, these two variables were excluded from entering in to the model.

With multivariate analyses, the existence of a high pair-wise correlation (in excess of 0.8) among independent variables indicates a serious degree of multicollinearity (Gujarati, 1999). By multicollinearity, it means that it may not be possible to tell the difference of one independent variable free from the influence of other independent variables with which it is correlated (Bernard, 2000; cited in Habtemariam, 2004). Hoshmand (1998) indicated that a high degree of correlation exists between two independent variables when a bivariate correlation is equal to 0.70. See appendix 2

Checking outliers

An outlier is a case with such an extreme value on one variable (a univariate outlier) or such a strange combination of scores on two or more variables (multivariate outlier) that distorts statistics. Outliers can be found in both dichotomous and continuous variables and they lead to both Type I and Type II errors (Fidell and

Tabachnick , 2007). Hence, it is better to check the presence of outliers before proceeding to the analysis.

The univariate outliers were checked for each variable using Box plot. It was found that there was no extreme value in each variable and, hence, there is no problem of univariate outliers. Moreover, the 100 cases were also screened for multivariate outliers using SPSS. Cases with standard residul greater than 3 or less than -3 are expected to cause multivariate outliers and, hence, they are selected and their associated Malanobis distances are calculated.

The criterion for multivariate outliers is Mahalanobis distance at $p<0.001$ (Fidell and Tabachnick, 2007). Mahalanobis distance is evaluated as X^2 with degrees of freedom equal to the number of variables, (ten). Any case with a Mahalanobis distance greater than X^2 (10) = 34.528 is a multivariate outlier. In our study, all cases have Mahalanobis distance less than 34.528. Hence, there is no problem of multivariate outliers in our data.

The definition of variables, signs expected and units of measurement that were used in the logit model are presented below.

Table15. Description of explanatory variables used in regression analysis

Variables	Signs expected	Values	Definition
Age	-	Year	Age of household-head in years
Sex	+	1-male 2-femal	Sex of household-head
HH size	+	Number	Total number of family members in a household
Farm size	+	Hectares	Total size of crop land owned by the household in hectare
Livestock	-	TLU	Total number of livestock in TLU
Education	+	Years	Average years of education in a household
Distance	-	Kilometers	Distance from the nearest town in kilometers
Dependency ratio	-	Number	Percentage of household members below 15 and above 65 years

4.3.3 Analysis of factors influencing livelihood diversification using logit model

Eight independent variables were included in the model. These variables were selected on the bases of theoretical explanation and the results of various empirical studies. Moreover, they were selected by testing significant differences of the mean using t-test & $\chi 2$ & testing the existence of muliticollinearity and multivariate outliers.

The maximum likelihood method of estimation was used to elicit the parameter estimates of the binomial logistic regression model and statistically significant variables were identified in order to measure their relative importance of pastoralists in diversifying their livelihood. The result of logistic regression is presented below

Table16. Logistic regression estimates of factors affecting livelihood diversification.

Variables	Coefficient	Odd ratio	Wald	Sig.
Age	-0.122	0.885	11.461	0.001*
Sex(1)	2.459	11.693	5.180	0.023**
HH size	0.956	2.600	8.111	0.004*
Farm size	1.287	3.621	7.203	0.007*
Livestock size	-0.046	0.955	0.848	0.357
Education	0.764	2.147	5.633	0.018**
Distance	-0.293	0.746	2.830	0.093***
Dependency	-1.777	0.169	4.157	0.041**
Constant	1.119	3.063	0.107	0.743

Note: *, **, *** denotes 1%, 5%, & 10% significance level respectively

X^2	61.617
-2logliklihood	43.765
Adjusted	R 2 0.460
Hosmer and Lemeshow Test	0.969
Overall cases correctly predicted	86%
Correct prediction of not diversified	59.1
Correct prediction of those diversified	93.6

Among the eight explanatory variables, sex, household size, farm size, and education are found to have the expected positive sign of influence and are statistically significant. While, variables such as age, distance, and TLU are found to have the

expected negative sign and except TLU all are statistically significant. The coefficient for dependency ratio is not as expected, but is statistically significant.

The age of household head had a negative and significant (1%) effect on livelihood diversification. This indicates the probability to diversify is higher for younger household heads. (Awoniyi, Olabisi Alaba, Salman, & Kabir Kayode) in South weste zone of Ngeria found that participants in off-farm work tend to be younger than not diversified. Age is significant at less than 1% level. Keeping other factors constant, the odd ratio for education level confirms that a unit increase in age of the household head will decrease the likelihood of being diversified by a factor of 0.8.

As expected, the coefficient for sex of household had a positive sign and statistically significant at less than 5% level. If the households head was male, the probability of diversifying livelihood would increase by a factor of 11.7. This finding is in agreement with that of (Awoniyi, Olabisi Alaba, Salman, & Kabir Kayode) in South west zone of Ngeria.

As expected, the coefficient for average household education level has a positive sign and statistically significant at less than 5% level. Those who are better educated have more probability to diversify than those who are less educated. This indicates that the exposure to education has a positive effect on participation of non-pastoral economic activities. The odd ratio for education level confirms that a unit increase in average education level of the household will increase the likelihood of being diversified by a factor of 5.6. This finding is in agreement with that of Adugna, and Dilruba Khatun and B.C.Roy(2012)

Consistent with the initial hypothesis, distance to the nearest town is negatively related to participation in non-pastoral economic activities. And this difference is found to be statistically significant at less than 10%. Keeping other factors constant, an increase of distance to the nearest town by one kilometer would decrease the probability to diversify by a factor of 0.7. Proximity to towns, therefore, negatively affects to livelihood diversification. This implies that, households near to towns have low cost for market centers and other initiatives for livelihood diversification. Households far from urban centers are not likely to diversify because of high transportation cost and lack of transportation service in same case. This finding is in agreement with that of Adugna (2012)

Dependency ratio is negatively related to livelihood diversification. In contradiction to the expectation, dependency ratio had a negative relationship on livelihood diversification and statistically significant at less than 5% level. Keeping other factors constant, a unit increase of dependency ratio would decrease the probability to diversify livelihood by a factor of 0.16. This finding is in agreement with that of (Adugna2012) Dilruba Khatun and B.C.Roy(2012)

The coefficient for family size and farm size of respondents are found to have the expected positive sign and their relationship is found to be significant. Family size is significant at less than 1%. This finding is in agreement with that of (Awoniyi, Olabisi Alaba, Salman, & Kabir Kayode). In line with my expectation, Livestock size (TLU) has negative relationship with livelihood diversification. But the coefficient was not statistically significant.

Exp β in Table14 is the multiplier, which predicts the change in odds for a unit increase in the independent variable. The Cox & Snell R-square is based on the log likelihood for the model compared with the log likelihood for a baseline model. The Nagelkerke R-square is an adjusted version of the Cox & Snell R-square. It adjusts the scale of the statistics to cover the full range from 0 to 1 (Kinear and Gray, 2000). The Nagelkerke R-square shows that 46 % of the variance in the dependent variable is explained by the explanatory variables.

Moreover, the Hosmer and Lemeshow $\chi 2$- test for goodness of fit is sufficiently large with high p value of 0.9 indicating the predicted values are closely related with the observed ones. The model correctly predicts about 86 % of the observed values

4.4. Major challenges of livelihood diversification

The study isolated the major challenges that pastoralists face in pursuing alternative livelihood strategies. expansion p. Juliflora, expansion of private agriculture, lack of initial capital, lack of agricultural input, lack of technical skill, lack of business awareness, lack of good market, frequent drought found to be the major challenges of livelihood diversification.

Table 17- Challenges of livelihood diversification

N.S	Variables	Frequency	Percentage
1	Expansion P. Juliflora	97	97
2	Expansion private Agriculture	96	96
3	Lack of initial capital	90	90
4	Lack of agricultural input	65	65
5	Lack of technical skill	54	54
6	Lack of business awareness	51	51
7	Lack of good market	43	43
8	Frequent drought	24	24

*Frequencies are out of 100 households Source: Field data collected for this study

Expansion P. Juliflora

As shown in the table above for 97% of the respondents, expansion of Prosopis Juliflora is the major challenges of livelihood diversification. It is observed that the species has been increasing in density as well as area coverage. Currently, this noxious tree heavily infests most agricultural as well as potential range lands in the Afar region. However, the land coverage and density of P. juliflora on the study area, is not well quantified. Much of the information is non quantitative description about area coverage of the plant.

The rapid spread of the plant also presents a number of social, ecological and economic concerns. Its vigor and competitiveness makes it a formidable invader of different land use systems, particularly along rivers, lakes, swamps, farmlands, grazing lands and ponds, causing devastation of these important habitats and ecosystems through intensive and aggressive colonization. Moreover, it also reduces the effectiveness of developmental investments by choking irrigation canals, fouling industrial pipelines, and threatening hydroelectric schemes (International weed science society, 2005 as sited in Shetie). Exotic species, therefore, contribute to social instability and economic hardship, placing constraints on sustainable development, economic growth, poverty alleviation and food security.

Expansion of large scale farms

As shown in the table above for 96% of the respondents, expansion of large scale farms is the major challenges of livelihood diversification. Since the Imperial regime, the Middle Awash Valley was incorporated in large scale commercial and state farms. The Afar survives for centuries through practicing their traditional production system

and way of life that is friendly to the Socio-economic and ecology of the area they inhabit. However, these have had severe impact on the Afar and their grazing land.

After the EPRDF government took power in 1991, some of the agricultural lands returned and re-located to different clans. But due to lack of attitudinal change among the Afar pastoralists toward farming practice in general and crop production in particular, shortage of skilled manpower, inadequate financial capital and weak technical support from the federal government, and the regional government could not maintain the farms. And hence, each clan lease-out its territory to private cultivators through net profit, sharecropping as well as fixed-rental price. However, according to FGD participant in Bonta and Badahamo communities, the private agricultural investment in Amibara wereda, do not bring any socio-economic benefit to the them rather it make their land to be exploited for "free". The Afars' share from the income and employment opportunities generated from operation of the private cultivators is insignificant.

Lack of initial capital

As shown in the table above for 90% of the respondents, lack of initial capital is the major challenges of livelihood diversification. Lack of access to financial credit service is one of the major problems for livelihood diversification. Particularly, the resource-poor households could not involve in non-pastoral business. Because of lack of initial capital most the Afar pastoralists lease out their private and clan lands to commercial farms and also not able to start their own non-pastoral businesses or enterprises.

Lack of agricultural input

As shown in the table above for 65% of the respondents, lack of agricultural input is the major challenges of livelihood diversification.

Table18- Agricultural inputs distributed by wereda

Imputes distributed	Measurements	2011/12 year	2013/14 years
Maize	Quintals	96	294
Tomato	Quintals	1	3
Onion	Quintals	4	9
Pesticides	Litters	651	850
Agricultural equipments	Number	8,701	2,500
Water pumps	Number	64	43

Source: Amibera werda pastoral, agricultural and rural development office

As shown in the table above, the agricultural inputs provided by werada pastoral, agricultural & rural development office to Agro-pastoralists was not significant. Moreover, Agricultural equipments and Water pumps was decreased by 71% and 32.8%, respectively. Because of lack of different agricultural inputs most of the pastoral households were discouraged to participate in crop production.

Lack of technical skill

As shown in the table above for 54% of the respondents, lack of technical skill is the major challenges of livelihood diversification. As the Afar for centuries traditionally relayed on livestock production, most of them have no technical skill on how to cultivate crop. As a result most of them cultivate land either by share cropping or by employing laborers or lease out their crop land.

Lack of business awareness

As shown in the table above for 51% of the respondents, lack of business awareness is the major challenges of livelihood diversification. Most of the respondents in the study area do not have awareness about business. Because training on micro business enterprises were not given either by NGO's or the government bodies. As a result most of the households do not have information and awareness about how to start income generating activities.

Lack of market

As shown in the table above for 43% of them responds, lack of market is one of the major challenges of livelihood diversification. Pastoralists in the study area do not get appropriate market for both livestock and crop production. For example, all respondents who cultivate cotton crop in the year 2013 were sold their output to the local commercial farms at low price.

Frequent drought

As shown in the table above for 24% of the respondents, frequent drought is the major challenges of livelihood diversification.

CHAPTER-FIVE

5.1. Conclusion and Recommendations

5.1.1. Conclusion

This study was designed to examine the level and types of livelihood diversification, to examine determinants of livelihood diversification among the pastoralists, as well as to assess the prospects and challenges of livelihood diversification in Amibara woreda. The study was carried out in Bonta, Badahamo, and Halaydegy peasant association. Primery datas were gathered through questioners, focus group discussion, and key informant interviews. The data sample was obtained from proportionately stratified and randomly selected 100 households. To analyze the data both descriptive analytical tools and econometric model was used.

In the study area 78% and 22% of the households were found diversified and not diversified, respectively. The figures show that the proportion of diversified households is higher than the not diversified households in the year during which the data was collected. In Bonta and Badahamo communities 80.7% and 86.6% of the households are diversified, respectively. This is because of their proximity to the commercial farms and Werer town as compared to Halaydegy pastoral communities. In Halaydegy only 46% of the households were participated in non-pastoral economic activities. Because these communities are relatively far from urban centers and commercial farms, hence 54% of the sampled households were not-diversified. In addition 90.6 % of the poor wealth group, 82.4 % of the average wealth group, and only 41.2 % of the better-off wealth groups were diversified. The primary motive for poor wealth group to diversify is to avert risks and secondly to coup with food insecurity caused by the reduction of livestock herds over time. While, the primary motives for the better-off of households to diversify is to accumulate wealth.

In the study area livestock production is still the most important livelihood strategies for most of the pastoral households, particularly for the average and better-off households. But these strategies became less suitable because of the expansion of large scale commercial farms at the expense of grazing lands, and also more recently the invasion of P. juliflora on most of grazing lands among others. As a result traditional pastoral livelihood strategy becomes less sustainable and sufficient to realize desired livelihood outcomes, hence Afar pastoralists, are likely to look for

alternative livelihood strategies such as, crop production, lease out of their private and clan lands, wage labor, formal employment, peaty trade, remittance, and sale of wood & charcoal.

Most of the better-off households have a large number of livestock and they are far from commercial farms. As a result 56.7% of them prefer to relay on their traditional livestock production strategies even though same 9.4% of them participate in crop production. While, most of the average and poor wealth groups have less livestock size as compared to the better-off wealth groups. Because most of them live near to farm areas and their past grazing lands are occupied by commercial farms. As a result they are involved in different low waged livelihood strategies. Among the poor wealth group 28.5% them is involved in waged labor, 14.2% of them lease out their land.

According to descriptive statistics of the sample households, the averages of some variables such as distance to the nearest towns, age, dependency ratio, and livestock size were found higher with not diversified households than the diversified households. On the other hand, the diversified households have relatively greater averages on the farm land size, family size, and average educational level of the household. In addition, it was found that the male headed households were more diversified as compared to their counterpart households.

In this study, large family size, age of the household, and farm size was found the most important factors for livelihood diversification. Households with greater household size are more likely to be diversified as compared with households with smaller household size. Similarly, it was found out that distance from the nearest town and farm scheme is the important factor for diversification of the household. This is because pastoralists residing in the remote rural areas have problems regarding access to markets, waged labor in the farm scheme, and formal employment. As a result, households who dwelled near to towns & market centers have shown more diversified than those households located far as they are exposed to information distortion as well as transportation problem. Other principal determinants of livelihood diversification in the study area are number of livestock owned and amount of land to be cultivated. Land holding size was found one of the important factors in diversifying the households. Farmers with greater farm land size more diversified than the less endowed households. On contrary, households who own large numbers of livestock

are less diversified and the vise verse. Livestock enables the households to be food secure either through the income earned or by direct consumption.

Furthermore, gender household head, average educational level of the household, and dependency ratio were found the crucial factors in determining livelihood diversification of the household. Diversification status of household was better in male headed households than female headed households. This leads to the conclusion that female headed households are more disadvantaged livelihood diversification than their male counterparts. Education helps to change an attitude of the household, which in turn enables them to participate in different livelihood strategies. Finally, it was realized that dependency ratio of the household have a negative relationship with livelihood diversification. Households with high dependency ratio have shown less likelihood to diversify.

Pastoralists in the study area encountered a number of challenges in pursuing alternative livelihood such as, the expansion of large state & commercial farms since the imperial period at the expense of grazing lands, the invasion of range lands by a pest wood p. juliforia locally called "Datahada", lack of initial capital because of absence of credit facilities for the pastoralists, lack of agricultural input, etc

5.1.2. Recommendation

- Based on the study, households with education and younger household head have had better opportunity in pursuing alternative livelihood strategies than non-educated and older households in the study area. Hence, the government should increase its effort on human capital development. It is recommended that the regional and federal governments should provide access to education for pastoralists. A short-term, informal education especially that targeted adult pastoralists who have had limited opportunities for formal education, could be effective.
- The study has provided evidence that gender of head of a household play a key role in determining livelihood status of the households. Thus, gender-sensitive policies that enhance endowments of female-headed households should be a key ingredient of livelihood diversification strategy.
- Governmental and NGOs should take their best efforts to provide the social welfare service in the form of development schemes that could assist pastoral

households in enhancing their living standards by encouraging them to form of different forms of cooperative organizations such as, rural saving and credit cooperative organizations(SACCOS) that provides credit service to its members, agricultural cooperatives that provides agricultural input at low price and high quality to its members, marketing cooperatives that markets the agricultural output of its members at a good price, etc. These enable pastoralists to cultivate themselves their private & clan lands rather than leasing out to the exploitative commercial farms.

- The livestock sub-sector is very important in assuring the desired livelihood outcome in the study area especially for the better-of. Hence, this sector has to be enhanced through the provision of common grazing land, better husbandry and management system, and better veterinary facilities. More over the livelihood of the better-off & the average pastoralist wealth groups should be enhanced by organizing them in cooperatives that encourages them to undertakes value addition on livestock production such as, fattening animals and exporting live animals to middle east countries, or at least supporting them to be potential suppliers to live animal exporters is necessary.
- The study area has a great potential of irrigated agriculture. Among 18 peasant association found in the wereda, the Awash River passes through 14 peasant associations. Therefore, increasing the productivity of major crops is feasible through the provision of cultivable land, provision of training centers to pastoralists, and application of important agricultural inputs such as fertilizer. Therefore, there is a need to provide farmers training centers as well as, to provide fertilizer for agro-pastoral households through the provision of credit service and opening fertilizer distribution centers at rural areas.
- Adverse impact of P. juliflora can be solved by enhancing the benefits and implementing proper management options. Complete eradication of P. juliflora is virtually impossible at the current state of management options but it is possible to reduce further spreading with proper and efficient utilization of the plant. Some of the lands covered by the plant should be re-prepared for communal grazing lands and crop lands. P. juliflora is used for firewood, and charcoal. Therefore, by legalizing the act of making and selling of charcoal and fire wood from the plant and organizing in cooperatives a lot people particularly the poor is the good measurement to minimize the adverse effects and to benefit from the plant.

6. References

Adugna Eniyew: Determinants of livelihood diversification in pastoral societies of Southern Ethiopia; June 2012

Admiral N.; Impact of livelihood diversification on household food security: The case of Hurungwe district, Zimbabwe; M.A thesis in development studies at the University of South Africa

http://www.onlineresearchjournals.org/JABR

Barrett, C; Reardon, T; and Webb, P.; Non-farm Income and Household Livelihood Strategies in Rural Africa: Concepts, Dynamics and Policy Implications; 2001.

http://inequality.cornell.edu/publications/working-papers/Barrett-Reardon-webb-IntroFinal.pdf (06/06/2011)

Bates, D. G. and Conant, F. P.; Article: "Livestock and Livelihoods: A Handbook for the 1980s" in Galaty, J. G.; Aronson, D.; Salzman, P. C.; and Chovinard, A. (eds.); The Future of Pastoral People: Proceedings of a Conference held in

Nairobi, Kenya 4 – 8 August 1981; International Development Research Centre; Ottawa, Canada, 1981.

Berjan, S.;Vittuari, M.; Bilali, H.E.; Pawn, B.; Diversification of Rural Economy and Households Livelihood Strategies in Sarajevo – Romanija Region; (year not indicated) www.pof.unssa.rs.ba/Zbornik_Agrosym_2010/PDF/.../Berjan_et_al.pdf (22/11/2012)

Broch-Due, V. and Anderson, D. M.; Article: "Poverty and the Pastoralist: Deconstructing Myths, Reconstructing Realities" in Anderson, D. M. and Broch-Due, V.; the Poor Are Not Us: Poverty and Pastoralism in Eastern Africa; James Currey Ltd; Oxford; Ohio University Press; Ohio, and East African Educational Publishers; Nairobi, 1999.

Broch-Due, V.; Article: "Remembered Cattle, Forgotten People: The Morality of Exchange and the Exclusion of the Turkana" in Anderson, D. M. and Broch-Due, V.; The Poor Are Not Us: Poverty and Pastoralism in Eastern Africa; James Currey Ltd; Oxford; Ohio University Press; Ohio, and East African Educational Publishers; Nairobi, 1999.

Bahhady, F. A.; Article: "Recent Changes in Bedouin Systems of Livestock Production in the Syrian Steppe" in Galaty, J. G.; Aronson, D.; Salzman, P. C.; and

Barrett, C. B.; Bezuneh, M.; Clay, D. C.; and Reardon, T.; Heterogenous Constraints, Incentives and Income Diversification Strategies in Rural Africa; August 2000; http://www.ies.wisc.edu.edu/ltc/live/basglo0008a.pdf (9/6/2011)

Barrett, C. and Reardon, T.; Assets, Activity and Income Diversification among African Agriculturalists: Some Practical Issues; March 2000.

http://dyson.cornell.edu/facility_sites/cbb2/papers.BASIS1 (22/11/2012)

Chovinard, A. (eds.); The Future of Pastoral People: Proceedings of a Conference held in Nairobi, Kenya 4 – 8 August 1981; International Development Research Centre; Ottawa, Canada, 1981.

Cisse, S.; Article: "Sedentarization of Nomadic Pastoralists and Pastoralisation of Cultivators in Mali" in Galaty, J. G.; Aronson, D.; Salzman, P. C.; and Chovinard, A. (eds.); The Future of Pastoral People: Proceedings of a Conference held in Nairobi, Kenya 4 – 8 August 1981; International Development Research Centre; Ottawa, Canada, 1981.

Demissie Damite: The Determinants and Impacts of Income Diversification in Rural Ethiopia: The Case of Communities in Southern Nations, Nationalities and Peoples Regional States; Msc Thesis in Economics; School of Graduate Studies, Addis Ababa University; July 2003.

Website:etd.aau.edu.et/dspace/bitstream/123456789/.../DEMISSIE%20DAMITE. pdf (22/11/2012)

Demurger, S.; Fournier, M.; Yang, W.; Rural Households' Decisions towards Income Diversification: Evidence from a Township in Northern China; April, 2010.

www.gate.cnrs.fr/IMG/pdf/DFY_April10.pdf (22/11/2012)

Department for International Development; Sustainable Livelihoods Guidance Sheets;

DFID, 1999

www.ennoline.net/pool/files/ife/dfid-sustainable-livelihoods-guidance-sheetsetion1. pdf (22/11/2012)

Dolan, C. S.; "I will sell my labour now:" Gender and Livelihood Diversification in Uganda; Canadian Journal of Development Studies; Vol. 25(4): 643 – 661.

Website: www.informaworld.com/index/933474127.pdf (09/06/2011)

Ellis, F; Occupational Diversification in Developing Countries and Implications for Agricultural Policy; Overseas Development Group; 2004

www.oecd.org/dataoecd/25/9/36562879.pdf (06/06/2011)

Ellis, F.; Rural Livelihoods and Diversity in Developing Countries: Evidence and Policy Implications; Overseas Development Institute; Natural Resource Perspectives No. 40, 1999 http://www.odi.org.uk (02/12/2012)

Ellis, F.; Rural Livelihoods and Diversity in Developing Countries; Oxford University Press; London, 2000. Website: www.oup.co.uk/pdf/1-19-829695-9.pdf (6/6/2011)

Ellis, F.; The Determinants of Livelihood Diversification in Developing Countries; Journal of Agricultural Economics; Vol. 51 (2): 289 – 302; May 2000.

http://onlinelibrary.wiley.com/doi/10.1111/jage.2000.51.issue-2/issuetoc (09/06/2011)

Ellis, F; Household Strategies and Rural Livelihood Diversification; Journal of Development Studies, Vol. 35: 1 – 38 (Routledge).

http://www.informaworld.com/smpp/title-content=t713395137 (6/6/2011)

Husein k. and Nelson J. 1999 sustainable livelihood and livelihood diversification. IDS working paper

Kajela G.; Bezabih E; Waktole T.; Livelihood diversification in Borena pastoral communities of Ethiopia: prospects and challenges

Mahdi E.; Farmers evaluation, adaptation and sustainable use of improved sorghum varieties In Jijiga woreda, Ethiopia(2005); M.Sc thesis in Agricultural extension; school of graduate studies; Alemaya Unversity; April, 2005.

Zeraye M.; Invasion of Prosopis juliflora (SW.) DC and Rural Livelihoods The Case of Afar Pastoralists at Middle Awash Area of Ethiopia; Msc Thesis in Management of Natural Resources and Sustainable Agriculture of Graduate Studies, Norwegian university of life science; June 2007.

http://www.umb.no/noragric

Appendix 1 Collinearity information of predictor variables

Variables	**Eigen value**	**Condition Index**	**VIF**	**1/VIF**
Age	0.404	4.872	1.088	0.919
Sex	0.303	5.627	1.202	0.832
Family size	0.171	7.493	1.191	0.840
Frmsize	0.142	8.214	1.101	0.908
Livstok size	0.102	9.675	1.133	0.882
Education	0.098	9.876	1.276	0.784
Distance	0.075	11.317	1.046	0.956
Dependency	0.067	11.955	1.178	0.849
Irrigation	0.040	15.457	1.270	0.787
Membship	0.009	32.581	1.079	0.927

Appendix 2-The correlation matrix of independent variables affecting diversification.

	1	2	3	4	5	6	7	8	9	10
Age	1									
Sex	.12	1								
Irrigation	-.03	-.135	1							
Family size	.09	.186	-.019	1						
Farm size	-.12	-.15	-.20*	-.02	1					
Livestock size	.06	.23*	.00	-.10	-.04	1				
Membrshp	.05	-.14	.124	-.00	.018	-.034	1			
Education	-.07	-.14	-.10	-.10	.185	-.26**	-.06	1		
Distance	-.16	.03	.25*	-.10	-.067	.31**	.02	-.18	1	
Dependncy	.02	-.01	-.14	-.13	.127	.087	-.03	.119	.06	1

*, **- the correlation significant at the 0.05 & 0.01 level Source: SPSS 20 output.

Appendix 3. Conversion factor used to convert livestock number into Tropical Livestock Unit

Multipliers used in converting livestock numbers into livestock units (1 LU=500 kg live weight)

Animals	**Africa**
Cattle	0.6
Camels	1.09
Sheep	0.08
Goats	0.07
Chickens	0.012
Horses and mules	0.9

Source

Kossila, V.: The availability of crop residues in developing countries in relation to livestock populations. P 29 – 39. In: Mahdi Egge: Farmers evaluation, adaptation and sustainable use of improved sorghum varieties In Jijiga woreda, Ethiopia(2005). P-71

Apendex-4 Survey questionnaire, FGD guide lines, key informant interview questionnaires

A) Survey questionnaire for pastoral households

Serial No. of the Questionnaire _____

Part one: General Information

1.1 – Date of interview _____ 1.3 – Name of the enumerator_____

1.2 – Name of peasant Association_____ 1.4. Signature _____

Part two: Characteristics of the Household

2.1. Sex of household head: 1. Male 2. Female

2.2. Marital status: 1. Single 2.Married 3. Widow/ Widower 4. Divorced

2. 3. Age of household head: _____Years

2.4. Education level of household head: _____ (last grade completed)

2.5. Education level of other members of the household (last grade completed)

2.5.1. Education level of wife□1st wife___2nd wife____3rd wife____4th wife_____

2.5.2. Education level of children□ 1st child____ 2nd child____3rd child _____

4th child_____5thchild _____6th child _____

2.5.3. If any other member of the household _____

2.6 .Size of Household

Total number of family members: _____

Members aged <14 _____

Members aged 15-64 _____

Members aged above 64_____

2.7. How far is your home from the nearest town? _____km

Part three: Household resource endowment

3.1. Access for Natural Assets

3.1.1. Do you have farmland? [1. Yes 2. No]

3.1.2. If yes how much is your farm size? _____ (hectare)

3.1.3. Do you have irrigation scheme? [1. Yes 2. No]

3.2. Access for Physical Assets

3.2.1. Number of livestock owned by the household

1. Cattle _____ 2. Sheep _____3. Goat _____4. Camel _____

5. Donkey _____ 6. Chicken _____7. Bee hives _____

3.2.2. List of farm implements owned by the household

1. Plough 2. Spade 3. Hoe 4. Sickle 5. Axe

3.2.3. Would you please tell me the number of houses you have? _____

3.2.4. Type of house:

1. Corrugated iron with partition _____
2. Corrugated iron without partition _____
3. Soil roofed with partition _____
4. Soil roofed without partition _____
5. Traditional tent _____

3.2.5. Do you have Rental houses [1.Yes 2.No]

3.2.6. Do you have accessibility for?

Transport services	[1.Yes 2.No]
Animal health post	[1.Yes 2.No]
Markets	[1.Yes 2.No]
Mobile telephone	[1.YeS 2.No]
Satellite TV	[1.Yes 2.No]
Radio	[1.Yes 2.No]

3.3. Access to financial assets

3.3.1. Is there credit and saving association or financial bank in your locality?

[1.Yes 2. No]

3.3.2. If yes, are you a member of any credit and saving association? [1.Yes 2. No]

3.3.3. Have you ever taken a loan? 1.Yes 2. No]

3.3.4. If yes, how many times? _____

3.3.5. Where did you take it from?

1. Credit and saving association 2. Financial bank
3. Family/relatives 4. Government Institution 5. NGO 6. Other

3.3.6. If no, what is the reason for not have access?

1. Terms or conditions of credit are not good 2. Too high interest/repayment
3. My religion does not allow me 4. I didn't need credit
5. Fear of debt 6. Absence of lending institutions
6. Other (specify) _____

3.3.7. Do you have any cash savings for your future use? [1. Yes 2. No]

3.3.8. If yes what percentage of your monthly income did you save?

1. Less than 5 % 2. 5-10% 3. More than 10%

3.3.9. What are the major reasons for saving?

1. To save for old age 2. For emergency cash requirement
3. To use it in drought years 4. Other (specify)

3.4. Social and Human capital

3.4.1. Do you belong to any formal social organization like Self-help Group (SHG)/Cooperative, village committee, school committee, etc [1. Yes 2. No]

3.4.2. If yes, which ones?_____

3.4.3. What benefits do you get from these groups? _____

3.4.4. Do you belong to any informal group? [1.Yes 2. No]

3.4.5. If yes, which ones? _____

3.4.6 What benefits do you get from these groups? _____

3.4.7. Compared to past, how have people's willingness to help each other changed?

a. Increased b. Decreased c. stayed the same

3.4.8. Is there any health institution in your locality? [1.Yes 2.No]

3.4.9. If yes, how many hours walking distance is the health service located from your home?

3.4.10. Was any member of the household sick in the last 12 months? [1.Yes 2.No]

3.4.11. If yes, what measures did you take? (Multiple responses is possible)

1. Traditional medicine 2. Take to health post
3. Take to health center 4. Take to hospital 5. Other specify

3.4.12. Is there any education institution in your locality? [1.Yes 2.No]

3.4.13. If yes, how many hours walking distance is the education center located?

3.4.14. Did you send any of your children to school? [1.Yes 2.No]

3.4.15. If yes, how many of them

3.4.16. If no, why?

1. They have to keep livestock 2. Inaccessibility of school
3. Any other specify

4.0 Livelihood Activities/ strategies

4.1 Which livelihood activities did you undertake to pursue your desired livelihood outcomes?

1. Sale of livestock [1. Yes 2. No]
2. Trade in livestock [1. Yes 2. No]
3. Crop cultivation [1. Yes 2. No]
4. Share from clan land [1. Yes 2. No]
5. Wage from farm employment in the farms [1. Yes 2. No]
6. Permanent employment in gov□t and farms [1. Yes 2. No]
7. Borrowing [1. Yes 2. No]
8. Bee keeping and sale of honey [1. Yes 2. No]
9. Sale of land [1. Yes 2. No]
10. Make and sell charcoal [1. Yes 2. No]
11. Sale of wood products [1. Yes 2. No]
12. Sale of milk [1. Yes 2. No]
13. Rental houses [1. Yes 2. No]
14. Sale of grass for thatching [1. Yes 2. No]
15. Livestock keeping [1. Yes 2. No]
16. Others (specify)

4.2. Rank the relevant means of livelihoods in order of their importance to your household (write the corresponding number i.e. 1, 2, 3, 4, 5, etc)

1st _____
2nd_____
3rd_____
4th _____
5th _____

4.3. Are there any livelihood strategies that you had undertaken but abandoned later? (Multiple responses is possible) [1. Yes 2. No]

4.4. If yes, which ones?

1. Animal husbandry
2. Rain fed cultivation
3. Small scale irrigated farm agriculture
3. Wage labor
4. Trading (outside of livestock
6. Trading in livestock
7. Make and sell wood and charcoal
8. Remittances
9. Lease out land
10. Other specify

4.5. Why did you abandon them?

Abandoned activity	Reason(s)
1._____	_____
2._____	_____
3._____	_____
4._____	_____
5._____	_____

4.6. Which livelihood strategies do you desire to undertake but which you are unable to pursue? (Multiple responses is possible)

1. Animal husbandry
2. Rain fed cultivation
3. Small scale irrigated farm agriculture
3. Wage labor
4. Trading (outside of livestock
6. Trading in livestock
7. Make and sell wood and charcoal
8. Remittances
9. Lease out land
10. Other

4.7. Why are you unable to pursue them? (Probe for reasons for each strategy that the respondent wishes to undertake)

Desired activity	Reason(s) for inability
1._____	_____
2._____	_____
3._____	_____
4._____	_____
5._____	_____

4.8. Have you maintained your traditional grazing lands? [1.yes 2.No]

4.8.1. If no, why?

1. Most of grazing land converted in to state and commercial farms
2. Agricultural expansion
3. Depletion of pasture
4. Conflict with neighboring groups
5. Other specify

4.8.2. What happened to your household when you lost grazing lands?

1. I lost my livestock
2. I started crop cultivation
3. I had to move my livestock to distant places
5. Other
4. I had to confine livestock close to my village

4.8.3. Did you mobile your livestock as you did it before 10/20 years [1.Yes 2. No]

4.8.4. If no which factors have led to further reduction in livestock mobility? (Multiple responses is possible)

1. Risk of conflict
2. Risk of animal diseases
3. Pasture and vegetation decrement
4. Expansion of irrigation agriculture
5. Water point decrement
6. Others

4.8.5. Is the current livestock production less viable than it was in the past?

[1.Yes 2.No]

4.8.6. If yes, why is the traditional livestock production less viable now?

1. Environmental change/degradation of pasture
2. Animal epidemics
3. Expansion of irrigation farming
4. Prolonged drought or sever recurrent drought
5. Other

4.8.7. Which livelihood system(s) will be the viable for your family in the future?

1. Rearing livestock
2. Combining animal rearing with crop cultivation
3. Trading in animal and other marketable good
4. Combining animal rearing with trading
5. Other specify

4.9. Why did you participate in livelihood activities other than pastoralism? Is it pushing or puling factors? (Multiple responses is possible)

1. Loss of livestock due to drought
2. The difficulty to rely on livestock alone
3. For additional source of income
4. Expansion of irrigation farming
5. To accumulate assets
6. Any others

4.9.1. If your answer for Q 4.4.1 is no, what was the main reason for not participating in non-pastoral economic activities?

1. I didn't need it
2. Household responsibility
3. Busy with pastoral activities
4. Lack of initial capital
5. Lack of market information
6. Lack of business skills
7. There is no employment opportunity
8. Located in far from the mark
9. Any other

4.9.2. Do you engage in crop production? [1.Yes 2. No]

4.9.3. If yes, how do you manage the different farm activities of your farm?

1. by you and your family labor
2. By employing laborers
3. By 1 and 2
4. By renting the land for others
5. by sharecropping

4.9.4. Do your children carry out own livelihood activities apart from what you undertake as a household? [Yes No]

4.9.5. If yes, can you state them? _____

4.9.6. What support do you suggest to enhance the active participation of the Afar people in diversifying their livelihood?

1. Skill training related to farming
2. Support the livestock sector (to release labor from livestock herding)
3. Support that will improve the educational level of the Afar people
4. Others (specify)_____

4.9.7. What types of non-pastoral economic activities have good prospect in this community?

1. Animal husbandry
2. Rain fed cultivation
3. Small scale irrigated farm agriculture
3. Wage labor
4. Trading (outside of livestock
6. Trading in livestock
7. Make and sell wood and charcoal
8. Remittances
9. Lease out land
10. Other

5. Livelihood outcomes

5.1. What do you desire to achieve in life? _____

5.2. Are the livelihood strategies that you pursue enabling you to attain the livelihood outcomes you desire?

1. Very much 2.To some extent No 3. Not at all

5.3. If your answer for Q5.2 is 2&3 how do you overcome the deficit? (Multiple responses is possible)

1. Diversification of economic activities
2. Reduction in consumption
3. Relief assistance
4. Support from friends
5. Borrowing from traders
6. Specify if any other

5.4. Which of the following factors are responsible for declined reliance on a traditional pastoral livelihood strategy? (Multiple responses is possible)

1) Increase in human population
2) Drought
3) Formal education
4) Subdivision/privatization of land
5) Interaction with non-pastoral ethnic groups
6) Loss of communal grazing lands by state and private farms
7) Loss of grazing lands by the envasion of P. juliflora
7) Livestock diseases
8) Decrement in pasture
9) Expansion of crop cultivation
10) Conflict with neighboring Isa
12) others (specify)

5.5. What do you perceive the current living standard of your household compared to 10 years ago?

1. Better 2. Worse 3. The same 4. I don't know

6.0. Challenges to livelihood diversification

6.1. What are the major constraints that pastoralists face in diversifying their livelihood? (Multiple responses is possible)

1. Lack of initial capital
2. Lack of business awareness
3. Lack of technical skill
4. Lack of market
5. Lack of agricultural input
6. Frequent drought
7. Lack of veterinary service
9. Other specify
8. Poor infrastructure (electricity, telecommunication, road)

6.2. Have you ever been visited by DA's? [1.Yes 2. No]

6.3. If yes, how many times you are visited in the last 12 months?

6.4. What kind of support do you get from them?

1) Provide technical assistance 2) Provide management assistance

3) Creating business linkage 4) Linkage to financial institutions 5) other specify

6.5. Which of the following are the major challenges to livestock marketing? (Multiple responses is possible)

1. Long distance to the market center
2. Unfavorable market condition
3. The market is not functional throughout the week
4. Lack of market for stock and their product
5. Other specify

B) FGD guide line

Date of interview.....

	Name of participant	Male	Female
1			
2			
3			
4			
5			
6			
7			
8			

1. What are the major non-pastoral economic activities undertaken by pastoralists in your communities? .....

2. Do all households undertake similar livelihood strategies? If no what makes households to differ? .....

.....

3. Why are pastoralists entering in to non-pastoral economic activities?

.....

4. What is the perception of pastoralists to non-pastoral economic activities?

.....

7. What are the major challenges pastoralists faces in perusing alternatives livelihood?

.....

.....

9. Are there any external supports your communities have received in pursuing alternative livelihoods from gov't or NGO's? If yes, what kind of supports do you get?

.....

10. Is there any change in mobility pattern in the last 20 years in your community? If yes, what cuases mobility of pastoralists?

.....

.....

C) Key informant interview with various experts

Date of Interview _____ Age group of Key Informant _____

Organization of Key Informant _____ Sex of Key Informant: Female Male

Name of key informant (Optional) _____

1. What are the livelihood strategies (non-pastoral) that have been adopted by the communities to secure their livelihood?
2. What do you think that the major factors that determine households to diversify their livelihood?
3. What changes in mobility and settlement pattern in the last 10years?
4. Give your opinions about the causes of changes
5. At present, how would you describe reliance on traditional pastoral livelihoods among Afar households? Is Increasing, Declining, No change
6. Give reasons for your response in Q6
7. Do you think that pastoralists get enough support in securing their livelihood?
8. If yes, what supports has been rendered by gov't and other organizations to the communities to bolster their livelihood strategies?
9. If no, what recommendations would you make to policy makers, donors etc on how to strengthen the non-pastoral livelihoods strategies and ensure food security at household level?
10. In your opinion what are the major challenges that people face in diversifying their livelihood?
11. What is your suggestion for overcoming the problems associated with livelihood diversification?
12. What support do you suggest to enhance the active participation of the Afar people in diversifying their economic activities?
13. Are there opportunities that are available to Afar households that they do not currently exploit to earn a living?
14. If yes, why do you think they are not exploiting these opportunities?
15. What should be done to enable them exploit each of these opportunities?
16. In your opinion, which types of non-pastoral economic activities have good prospect in this community?
18. Is there any policies, legislations, regulations, local norms, traditions, etc that encourage or discourage pastoralists to diversify their livelihood?