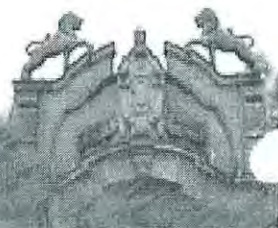


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**THE EFFECT OF CLIMATE CHANGE ON PASTORALISM IN  
ETHIOPIA: THE CASE OF AWASH**

**BY**

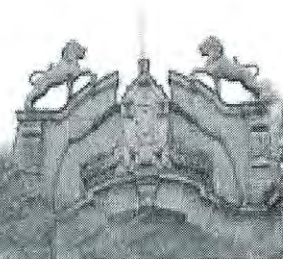
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**ETHIOPIA: THE CASE OF AWASH**

A thesis submitted to the School of Graduate Studies of Addis Ababa University in  
Partial fulfillment of the requirement for the Degree of Master of Arts in  
*Regional & local* Development Studies

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By Miftah Mohammed,

**APPROVED BY BOARD OF EXAMINERS**

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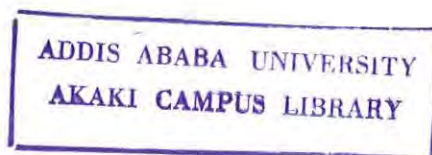
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EXTERNAL EXAMINER

DR.WELDAMLAK BEWKET

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INTERNAL EXAMINER



## ACKNOWLEDGMENTS

Above all, MAY ALLAH BE PRAISED. I am thankful to God for favor and mercy bestowed upon me.

My great appreciation and thanks are due to all those who helped me in having this study become real. It is my pleasure to express my heartfelt appreciation and special gratitude to my advisor, Dr Mulugeta Abebe, from Institute of Regional and Local Development Studies, who gave me appropriate guidance, through insightful comments, corrections and encouragement at all stages of the study.

I owe my earnest thanks to Dr Beamlak Alamrew and Dr Weldamlak Bewket for encouraging me to work my research on this topic and more importantly for their constructive and critical comments given me as my examiner during my paper defense.

My gratitude and thanks are due to officials and experts working in Awash wereda and the Afar pastoralists for Cooperating with me in doing this research in their locality and providing me with valuable information and data. My appreciation goes to all informants that participate in key informant and household interview as well as focus group discussion sessions for the time, accommodation they provided me and above all for their cooperation in enabling my data collection task successful.

I would also pay tribute to Mr. Abdulkadir Mah and Partnership for Pastoralists Development Association (PAPDA) for the support provided me and Ato Murha Abekeri for smoothing my data collection task in the wereda, to Ato Ahmed Mohammed Musa who has helped me a lot during data collection throughout the fieldwork and Ato Mohammed Detona for his contribution in translating interview scripts from Afar to English and Amharic and for his valuable contribution in the due analysis process.

Lastly but not least, I would like to extend my gratitude and thanks to my parents and my wife for being besides me throughout my career endeavor and personal development.

## LIST OF ABBREVIATIONS/ACRONYMS

AU	African Union
ANRS	Afar National Regional State
ASAL	Arid and Semi-Arid Land
CVA	Capacity and Vulnerability Assessment
CSA	Central Statistics Authority
DFID	Department for International Development
EU	European Union
IIRR	International Institute of Rural Reconstruction
IPCC	Intergovernmental Panel on Climate Change
IGAD	Inter Governmental Authority Development
FDRE	Federal Democratic Republic Ethiopia
FGD	Focus Group Discussion
IFAD	International Fund for Agricultural Development
ILRI	International Livestock Research Institute
IPCC	Intergovernmental Panel on Climate Change
KII	Key Informant Interview
PRA	Participatory Rural Appraisal
NAPA	National Adaptation Programs of Action
ODI	Overseas Development Institute
PCI	Pastoralist Communication Initiative
SLA	Sustainable Livelihoods Approach
TLU	Tropical Livestock Unit
UK	United Kingdom
UNICEF	United Nations Children's Fund
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNOCHA	United Nations Office for coordination Humanitarian Affair
USAID	United States Agency for International Development
VCA	Vulnerability Capacity Assessment

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## **The Effect of Climate Change on Pastoralism in Ethiopia: The Case of Awash**

**Abstract:** *Climate change is one of the greatest challenges that the world is facing today. Climate change has become world top 10 challenges which pose a risk to livelihood security. The risk is higher in countries and regions where the dependence on natural resources is high and the adaptive capacity to climatic changes is low. Afar is such a region. The majority of the region's population's sources of income, employment and food depend on pastoralism and agriculture. With the repeated incidence of drought, it becomes important to understand the impacts of climate change on pastoral livelihoods. The research into climate change effect on livelihood is still in an early stage of development and little work has been done in the area particularly as this related to the case of climate change effect on the pastoralist community in Ethiopia. Building on a case study of pastoralists in Awash wereda, this thesis explores and analyzes how the interaction of climate change effect with non climatic stressors contribute to vulnerability of livelihoods. To address the objective of the research qualitative research method is used. The framework of Vulnerability and Capacity Assessment (VCA) is used. Thus PRA tools such as transect walk, observation, together with interview and focus group discussion techniques of qualitative data collection are employed to generate the data. Key underlying drivers of vulnerability in Awash wereda emanate from climatic and non climatic factors. These are environmental degradation; encroachment of land by Prosopis, population pressures; resource scarcity induced conflicts; inadequate non pastoral, non farming opportunities; poor access to infrastructure; resources and services; weakening role of traditional institutions. The pastoralists have been responding to these changes using different coping mechanisms. They are using traditional adaptation mechanisms of mobility, social safety net and herd splitting. But this has become weakening and people have started new mechanisms of coping. These are diversification of sources of income, employment and feeding. The new livelihood strategies such as farming, trading and waged labour are challenged by limitations in skill, knowledge and resource. The efforts underway, the initiatives and changes occurring in pastoralism should therefore be augmented and supported through investment and knowledge transfer. Interventions should focus in addressing the underlying drivers of vulnerability of livelihood to be successful.*

**Key words:** *Climate change, Afar, pastoralism, livelihood, vulnerability, coping mechanism, diversification.*

## Chapter one: General Introduction

### 1. 1. Background

Pasoralism is a way of life and a production system that primarily depends on livestock herding. It is a production strategy in which people raise herd animals as a means to earn a livelihood, particularly in arid and semi arid areas (Sandford, 1983). The pastoralist population in Africa is estimated at 268 million, living on an area representing about 43 percent of the continent's total land mass. Pastoralism contributes to 10 to 44 percent of the Gross Domestic Product (GDP) of African countries (Roger 2001:11, African Union, 2012:10). In Ethiopia Pastoralism makes up a livelihood for about 20% of the total population. Moreover, in Ethiopia the pastoralists reside in about 60% of the total land area of the country. Over 70% of the country's livestock export potential and 75% of its wildlife are also located in the arid and semi arid pastoral areas (African Union, 2010:2).

The pastoral areas of Ethiopia and the horn are known for their arid and semi arid ecology. This is characterized by intermittent, small and unpredictable amount of annual rain fall (African Union, 2010, Wassie etal, 2008:3, Roger 2001:46).The pastoral community survived in this ecology for centuries via resembling and blending to the environment. However the deterioration in local, regional and global environmental conditions affected pastoralists more than any other community (Courtenay Cabot Venton etal, 2012:15). This is due to the fact that pastoralism relies on the availability of water, pastures and labour to thrive - with water as the determining factor. In other words Pastoralists depend for their survival on ecosystem and natural resources exploitation. And climate change primarily affects the ecology by creating anomalies in the environmental conditions. Climate change thus affects pastoralism which has strong dependency in the well functioning of the wider ecology.

Climate change and global warming-effect accelerated phenomenon of natural calamity. This has been manifested by increasing trend in the occurrence of natural disaster in dry land areas of the country. Consequently, drought has become frequent phenomenon in these areas. This in turn

has had a repercussion impact on pastoral societies making their livelihood to become the most vulnerable (Courtenay Cabot Venton et al 2012:16).

The Intergovernmental Panel on Climate Change (IPCC), in its Second Assessment Report, defines vulnerability as “the extent to which climate change may damage or harm a system.” It adds that vulnerability “depends not only on a system’s sensitivity, but also on its ability to adapt to new climatic conditions” (Watson et al. 1996: 23). Vulnerability to climate change by the pastoral societies of Ethiopia is not only resulted from the dependency of the community on ecosystem and the effect of climate change on the environment but it also resulted from the socio economic and political conditions in which pastoralism operates. That the pastoral areas of Ethiopia has been marginalized and the governments and nongovernmental actors in the past have made little investment on basic physical and human infrastructure (African Union 2012:17, Kate Wellard Dyer, 2012: vii). This has resulted in a situation where the pastoral communities of the country to be Poor, underdeveloped and with weak resilience. Accordingly the pastoralist became one of the most vulnerable communities in Ethiopia (ODI 2009:1). According to Ribot (1996), inequality and marginalization are among the most important determinants of vulnerability (Santiago: 2001:9). This made societies capacity very weak hence the pastoralists to be highly susceptible to any kind of shocks.

Despite the economic, ecological and social value of pastoralism and the pastoral communities in Ethiopia, it has not obtained the required attention by development actors and policy makers in the country in the past. This resulted in weakness in pastoral communities’ resilience, sensitivity and adaptation capacity. On the other hand, in spite of pastoralism being a way of life designed to respond to the changing environment, the accelerated deterioration in global climate since recent decades posed threat to the well being of this way of life. Pastoralists suffered from vulnerability to climate change.

In this paper, we study the effect of climate change on livelihood of pastoralist and agro pastoralist people. We focus on the various effects of climate change on pastoralists in Afar region specifically on natural biodiversity, livestock production, resource of land and pasture, pastoral way of life and socio economic aspects of the pastoral societies. How this relates to

vulnerability of livelihoods. We discuss other non climatic factors that caused or relate to the susceptibility and vulnerability of the pastoralist people to natural and manmade shocks. The different approaches used as means of adaptation to climate change and or resilience are to be studied and analyzed in light of their relevance and applicability to serve the purposes in the pastoral areas of Ethiopia.

## **1.2. Problem Statement**

Ethiopia hosts a large population of pastoralists and agro pastoralists. Ethiopia, Kenya and Somalia are countries that have pastoralists as considerable percentage of their population. In Ethiopia, pastoralists occupy larger geographical area and pastoralism is a source of national revenue and provides employment opportunity to considerable percentage of the country's total population. Pastoral areas of Ethiopia cover about 63 % of the country's landmass and constitute 12% of the total population (CSA, 2008., MoARD., 2008). Ethiopia ranks the fifth of the largest group of pastoralists in the world. In Ethiopia the livestock-dependant leather industry is the second largest source of foreign currency after coffee (African Union, 2010:12).

Pastoralism is a means of living used by people who are coping with the changing environment they are surrounded by (African Union 2012:21, ODI 2009:2, and Roger 2001). Pastoralist survived for centuries in areas where aridity is dominant and the amount of annual precipitation is small. Through its dynamic, flexible and complex structures pastoralism has proved to be adaptive to uncomfortable natural conditions of dry lands by providing and conserving a large array of ecosystem services in semi-arid and arid ecologies. During the last decade's of the millennium pastoralism has been recognized as essential for the sustainable management and ecological health of dry lands, and as also highly sensitive to increasing environmental degradation and global warming. At the same time climate change affects pastoralism and all ecosystem services it provides.

For developing countries like Ethiopia, the effect of climate change is particularly daunting. The arid and semi arid areas of Africa have been known by irregularity in climatic conditions. This is especially true to the pastoral area in Ethiopia and the horn of Africa. In other words "Drought is endemic to the Horn and no one has known it otherwise. The fluctuations of rainfall have been

noted for as long as records have been kept, and pastoralist communities have lived and thrived through peaks and troughs of precipitation for centuries” (International Federation on Red Cross and Red Crescent Societies 2011:8).

Due to deterioration in global environmental and climatic condition the frequency and intensity of droughts has increased in recent years, severely affecting the livelihoods of millions of pastoralist peoples (MRC Technical Paper, 2010:2). Extreme weather conditions, increases in floods, and land degradation have placed additional stress on economic base and productive assets and increased the vulnerability of the pastoral households. Livestock numbers were tremendously reduced in some areas. Livelihoods have suffered very much from consecutive droughts. These have caused food insecurity among the pastoral communities in the study area (Belay Simane, 2012, 9).

The drought conditions in the year 2011 have most severely affected pastoralists and their animals, with the largest impacts in regions of northern Kenya, south eastern Ethiopia and Somalia. According to reports, estimated number of vulnerable populations affected by this drought estimated 3.2 million in Ethiopia (UN report, International Federation of Red Cross and Red Crescent Societies, 2011:1). Climate change and the combined effects of soil erosion and reduced vegetation cover/deforestation is also leading to biodiversity loss with its longer consequences of loss of indigenous knowledge and information systems on pastoral production and natural resource management.

The Afar pastoralist people are located in the southeastern lowland areas of Ethiopia. This area is characterized by arid and semi arid land (ASAL) in which pastoralism is the dominant mode of production as well as way of life for the majority of people. This livestock herding dependent way of life is highly tied to natural resources of pastures and water exploitation to thrive. This makes pastoralism inherently to be sensitive to climate change and extremely exposed to climate change impacts. The pastoralist and agro pastoral communities in Awash area have been exposed to recurrent incidence of drought, resource use induced conflicts and the livelihood of the pastoral community in the area is as a whole characterized by vulnerability. For this there are different explanations given by actors and scholars. This include relating the vulnerability of livelihood among pastoralist to climate change, seeing the issue in light of Malthusian causation

and association the problem with political and economic marginalization and policy related challenges.

The balance is that the vulnerability of livelihood in pastoral areas including in Afar region should be seen beyond natural calamity resulting from climate change. Climate could trigger the problem but could not be the sole reason for livelihood vulnerability. Owing to the aforementioned problems understanding the contribution of climate change effect to the vulnerability of livelihood among Afaris become vital.

### **1.3. Research Question**

In line with the background of the study and problem statement mentioned above the research tries to answer following questions:

1. How do different individuals and social groups in pastoral communities perceive and interpret climatic and socioeconomic changes?
2. What are the major climatic and socioeconomic impacts of these changes on the livelihoods of pastoral communities?
3. What are the underlying causes of vulnerability shaping pastoral communities?
4. How do pastoral communities respond to the perceived changes?
5. What are the main livelihood assets of pastoral communities for adapting to, environmental and socioeconomic changes?

### **1.4. Objectives of the Study**

#### **1.4.1. General Objective**

Generally the study aims to assess the effect of climate change on natural bio diversity and socio cultural assets of the pastoralist community and the contribution of this to the vulnerability of livelihood of pastoralists.

#### **1.4.2 The Specific Objectives are to:**

- To asses pastoral communities perception to climate change and climate change effect
- Reflect on the effect of climate change on livelihood situation on the pastoralist in Afar

## Chapter Two: Literature Review

### 2.1. Introduction

Climate change has become a matter of concern for policy makers, development actors and communities at various levels. Climate change posed an inescapable challenge that society would have to deal with. Recent scientific studies and reports of international institutions and organizations that are concerned with global climate issues including National Aeronautics and Space Administration (NASA), and Intergovernmental Panel on Climate Change (IPCC), recognized the deterioration in world climatic condition especially since the last fifty years. The UN Intergovernmental Panel on Climate Change has established that atmospheric concentrations of greenhouse gases to have increased markedly since the Industrial Revolution (Climate change fact sheet pp1, UNFCC AND UNEP 2002:5).

According to NASA the evidence of rapid climate change is compelling. These include global sea level rise of 17 meter, global temperature rise, warming of oceans, shrinking and decrease in mass of The Greenland and Antarctic ice sheets, Glaciers are retreating almost everywhere around the world — including in the Alps, Himalayas, Andes, Rockies, Alaska and Africa, increasing extreme events, increasing in ocean acidification. More importantly climate scientists agree that climate-warming trends over the past century are very likely due to human activities, and most of the leading scientific organizations worldwide have issued public statements endorsing this position (UNFCC and UNEP 2002:5, NASA accessed on October 2013). Moreover according to World Bank 2012 climate change not only impacted on the socio economic aspects of most developing countries but the area of the Earth's land surface affected by drought has also increased substantially over the last 50 years, faster than projected by climate models (World Bank 2012: XV).

Climate change is already a reality in Africa with tremendous impact on the continents development. There are recurrent and intensified droughts in eastern Africa; unprecedented flash floods in western Africa; and an increase in ocean acidity around Africa's southern coast. Vastly altered weather conditions and climate extremes threaten agricultural production and food security, health, water and energy, which in turn undermine Africa's ability to grow

and develop. Climate and environmentally related disasters which threaten human security can induce forced migration (Brown, 2007:8) and produce competition among communities and nations for water and basic need resources, with potential negative consequences for political stability and potentially lead to conflict among and between competing nations and groups (Anthony et al. 2010, IGAD 2012:6, Hany et al. 2009:2, Stark, 2011, Bogale, 2006:29).

Climate change is considered as posing the greatest threat to agriculture and food security in the 21st century, particularly in many of the poor, agriculture-based countries of sub-Saharan Africa (SSA) with their low capacity to effectively cope (Meseret, 2009:2, MRC Technical Paper 2010:2, Eva Ludi 2009:2). Current estimates indicate that the greatest losses in suitable cropland due to climate change are likely to be in sub-Saharan Africa. The region's dependence on rain-fed agriculture means that production is vulnerable to climatic variability, which can adversely affect food security, human well-being and exports (Gordon 2009). In general sense the most important impacts of climate change on rural livelihoods include increases in environmental risks, reduction in livelihood opportunities and stresses on existing social institutions (Pekka et al. 2011:3).

Ethiopia is among developing countries list contributor but most vulnerable to climate change. The World Bank estimates that Ethiopia's carbon dioxide emissions per capita stood at 0.1 metric ton of CO<sub>2</sub> per capita in 2007-11, as compared for instance to 17.9t/CO<sub>2</sub> in the United States, 9.6t in Germany, 5.3t in China and 1.5t in India (Evans, 2012:29). Ethiopia's high vulnerability derives in large measure from the country's heavy dependence on agriculture and natural resource exploitation for its economic survival. Agricultural production is highly vulnerable as it is dependent on rainfall (WFP-Ethiopia, 2009:10). In Ethiopia the impact of climate change is felt in almost all economic and social sectors, including agriculture, pastoralism and or livestock, water, energy and health sector. One consequence of climate change is recurrence of drought and other natural hazards (Meseret, 2009 1-2).

Recurrent droughts occurring in different parts of the country have caused loss of human/animal lives and productive assets and have had a considerable effect on the national economy (NAPA, 2007: VII). Oxfam estimates that drought alone costs Ethiopia \$1.1 billion

per year (Derek et al 2012:1,venton et al 2012:14,USAID, 2011, UNDP,2007/8:29-33). In addition to Droughts, floods are also very common occurrences in Ethiopia. Major floods occurred in different parts of the country in 1988, 1993, 1994, 1995, 1996 and 2006 leading to loss of life and property (IGAD, 2008:27-28).

Climate change has become a major feature of development discussions about pastoralism. It has become so because pastoralists have been severely affected by the effect of climate change and it is projected that climate change in much of the arid and semi arid areas will be manifested in increased frequency and severity of drought and that pastoralists will more and more become victims of this. It is also partly because some researchers assert that pastoralism itself, like other forms of livestock production, is an emitter of greenhouse gases, particularly methane, and in a way disproportionate to its economic value (Gomes,2006:6,Oxfam 2008:3).

Projecting future climates in pastoral areas is also fraught with uncertainty. Regional projections in the literature (for example the Fourth Assessment Report of the IPCC) are usually for long timescales (e.g. 2080-2099) and for large regions that include both pastoral and sedentary farming areas. More localized projections foresee that the arid and semi-arid grazing systems in East Africa are highly vulnerable to a combination of climate change and socio-economic factors. More generally, there is an assumption that pastoral areas face an increased risk of drought events, due to increased variability of rainfall but also higher temperatures, even if mean rainfall is predicted to rise (Gordon 2009).

These projections of future climate in pastoral areas have led to a polarized discussion of impacts on pastoralists. On the one hand there is a fear, that pastoralist livelihoods, especially in East Africa, are fast becoming unsustainable: pastoralists are in danger of becoming “the first climate refugees”. On the other hand, there is a view, presented by NGOs and others that pastoralists are by their nature adapters, and if left to themselves will adapt, quite possibly more successfully than dry land crop-farmers (Little, 2010, IIRR, 2003, Brooks, 2006, Petersberg, 2010, AU 2010). So in one or another way climate change is an important issue in pastoral development discourse and literature. This is particularly due to the fact that

pastoralism has closer attachment to the well being of ecology in general and the vulnerable livelihood situation among pastoralists.

## **2.2. Definitions and Conceptualization of terms**

The first part of this chapter will briefly define pastoralism and discusses concepts and terms used in literature of climate change and livelihood vulnerability. The second part introduces the Sustainable Livelihoods Approach (SLA) and the vulnerability Capacity Assessment (VCA) method in climate change study.

### **2.2.1 Definition of pastoralism**

Pastoralism is a way of life and a production system for a large number of Africans. Pastoralists mostly inhabit in arid and semi-arid ecology (Oxfam, 2008:7, AU, 2010, Roger, 2001). Pastoralism is a way of life for some 20 million people across sub-Saharan Africa. The categorization of pastoralism is usually made by the degree of movement. This is nomadic, transhumant and agro-pastoralism (Africa union 2010:5, Roger, 2001:11). Pastoralists are people who depend primarily on consuming and selling livestock or livestock products like milk. Apart from meat and milk, livestock fibers and hides can also be of substantial economic importance. Agro pastoralism is a production that combines agriculture with pastoralism. Agro-pastoralists engage in rearing of livestock and cultivation of arable land for production of crops and cereals to feed their families. (Roger 2001:11).

Pastoralists typically graze their animals on communally-owned and -accessed pastures, and move in search of water and pasture seasonally (African Union, 2011:5, Kate Wellard Dyer 2012: IV). Mobility in pastoralism is made with rational decision that aims at efficient, effective and sustainable use of grazing resources and water (Africa Union, 2012:6, Kate Wellard Dyer 2012:1, Oxfam, 2008: 2). Mobility in pastoralism is also made as a strategy to cope with the changing environmental conditions. Mobility widens the option for the pastoralist's group's access to water points and grazing pasture which irregularly distributed in the wider ecology. The pastoral way of life is inherently designed shaped and developed as a response to the arid and semi arid ecology surrounding it and the marked rainfall variability characterizing it.

In this way pastoralist has long ago been learnt how to blend in to the environment. The blending in to the environment strategies traditionally been used include the rearing of different livestock species, to utilize different types of vegetation and because each species has different watering requirements, selective breeding to improve drought resistance and milk production traits of their livestock. “They also altered the species composition of their herds in the face of rainfall and other trends, such as market opportunities. Pastoralism adapted to drier periods and wetter periods, to changes in disease risks, and to conflict.” (African Union 2010:22).

### **2.2.2. Conceptualizing Vulnerability**

The bulk of literature on vulnerability and adaptation contains a sometimes confusing collection of terms: vulnerability, sensitivity, resilience, adaptation, adaptive capacity, risk, hazard, coping, and so on (IPCC, 2001; Adger et al., 2002; Burton et al., 2002). The relationships between these terms are often ambiguous, and the same term may have different meanings when used in different contexts and by different authors. These terms defined by different authors and actors differently depending on the point of view the definition aims to serve.

Researchers from the natural hazards field for example focus on the concept of risk, while those from the social sciences and climate change field prefer to talk in terms of vulnerability (Downing et al., 2001; Allen, 2003). Social scientists and climate scientists often mean different things when they use the term “vulnerability”. Social scientists tend to view vulnerability as representing the set of socio-economic factors that determine people’s ability to cope with stress or change (Allen, 2003), where as climate scientists often view vulnerability in terms of the likelihood of occurrence and impacts of weather and climate related events.

Definitions of vulnerability in the climate change related literature tend to fall into two categories, viewing vulnerability either (i) in terms of the amount of (potential) damage caused to a system by a particular climate-related event or hazard (Jones and Boer, 2003), or (ii) as a state that exists within a system before it encounters a hazard event (Allen, 2003). The

Looking at vulnerability from the food security point of view, the FAO publication *The State of Food Insecurity in the World* (1999), defines vulnerability as “the presence of factors that place people at risk of becoming food insecure or malnourished.” Clearly, this definition encompasses causes of food insecurity other than climate change (e.g., armed conflict, landlessness, etc). Nevertheless, the concept of vulnerability includes hunger vulnerability—which refers to the vulnerability of individuals or households rather than that of regions or economic sectors.

Within the Sustainable Livelihoods approach (SLA) developed by The UK Department for International Development defines a ‘sustainable livelihood’ in the following way:

*A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living... A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future [Department For International Development].*

### **2.2.3. Vulnerability Assessment Approach**

The vulnerability assessment approach emerged over the past decade from an evolution of different approaches for assessing vulnerability to climate change. Vulnerability approaches came out of (natural) science-driven assessments, which attempted to estimate potential (mainly biophysical) climate impacts. Due to the growing comprehension that vulnerability to climate change is driven not only by climatic factors but by many other variables, and because it is still not possible to predict climate change impacts on even a regional scale, and certainly not at a local scale, these impact assessments later developed into more integrated, policy-driven vulnerability assessments.

Thus for the present framework an approach is suggested that not only considers impacts driven by climate change, but also by non-climatic factors (environmental, economic, social, demographic, technological, and political factors) that may have beneficial and/or adverse effects on the exposure, sensitivity, and adaptive capacity of communities (Figure 1). Furthermore, this approach not only takes the existence of adaptation options into account, it also considers the community’s inherent capacity to adapt (Füssel and Klein 2006).

A study conducted by ODI in 2008 in pastoral resided regions in Ethiopia (namely Oromia, Afar and parts of Somali Region) reveal the presence of various risks in pastoral areas faced by the population. The most important of which are loss of productive assets due to natural and manmade calamity, declining livestock and agricultural productivity due to poor husbandry practices and technologies, breakdown of traditional institutions and social relations and problems related to access markets.

These risk factors combined with the poor level of socio- economic development in the pastoral areas affected the livelihood of the community and contributed for a situation of food in security characterizing the area (Sara etal 2008:8). In other words the loss of productive assets due to drought and other non climatic factors contributed to the situation of increasing household food insecurity in the study area. In addition to drought, land degradation, population pressure, low livestock and agricultural productivity are factors that caused vulnerability of livelihood among pastoralists in Ethiopia.

In addition for Oxfam 2008 the main challenges that hinder pastoral way of life and major factors behind the vulnerability of livelihood among pastoralists in Ethiopia are categorized in to four major reasons. These are: climate change, political and economic marginalization, inappropriate development policies, and increasing resource competition (Oxfam 2008:2). Corollary, in her famous study Devereux attributes vulnerability of livelihood among pastorals in Somali region to a series of shocks, some natural and some policy-related. Devereux argues that people of Somali Region experience multiple sources of vulnerability including drought, increasingly difficult policy environment and conflict (Devereux 2006:169).

Similarly UNOCHA-PCI series of studies and report on vulnerability of livelihood among pastoralists in Somali Region reveal that it has resulted from numerous shocks and stresses, including recurrent drought, livestock marketing constraints and restricted mobility due to conflict and insecurity. Vulnerability in the region is thus multi source. It relates to poor service in health and education, low immunization and high illiteracy rate and poor governance (UNOCHA 2005:1).UNOCHA report in 2006 on the other hand support the idea

that drought triggers crisis in livelihood but the main causes of vulnerability of livelihood among pastoralists in Somali Region are "*social and political, not natural.*" According to this report next to drought conflict is the second cause of vulnerability while poor governance is the third source of vulnerability (UNOCHA 2006:1).

Complimentary to these view is the work by Magda (etal. 2009) which maintain the argument that the fundamental problems of marginalization and weak governance lie at the root of the chronic poverty and vulnerability of pastoral areas (Magda etal. 2009: III). In addition, according to report from the study of drought and resilience in Ethiopia and Kenya, vulnerability of livelihood in pastoral areas is caused by devastating conditions brought on by weather, conflict, government neglect or a combination of each (Courtena etal. 2012:12). Conflict has often been part of pastoralist live and there are a bulk of literature written on conflict inherent in pastoral production system triggered by competition in use of scarce resource of water and pasture. In addition livestock is a fundamental form of pastoral capital. It is the pastoralist's means for the production, storage, transport and transfer of food, wealth and cultural and ritual value. Any threat to livestock – such as lack of fodder or water, raiding, price variation, and disease – is a direct threat to pastoral livelihoods. Yet when external social, environmental, political and economic changes are narrowing, pastoral livelihood options, the incidence and intensity of clashes within and between pastoral communities and other land users increase (Roger 2001, little 2010:4, Nori etal, ODI, 2009:1-3).

The other factor emphasized by many authors and actors is the economic and political marginalization aspect of livelihood vulnerability (FAC, 2012:1, Santiago, 2001:9). This view is based on the fact that in many societies, pastoral communities remain among the most politically and economically marginalized of groups (Nori etal:2). For many decades pastoralists have been marginalized, and their concerns have been sidelined from decision making and policy arena (African Union, 2010: Kate Wellard Dyer, 2012: IV, ODI, 2009:1). The result is underinvestment on the areas basic human and physical infrastructure. This increased vulnerability and susceptibility to shocks of the pastoral community.

In Ethiopia in general and in dry land areas in particular the main climate-related vulnerabilities over recent decades have been:

**Successive poor rains:** Pastoralism is well adapted to coping with a single rain failure in a particular area, but when successive rainy seasons fail there is simply insufficient regeneration of grazing land, and pasture shrinks. This failure has been major factor for vulnerability of livelihood in many dry land areas of Ethiopia and the drought that seriously hit Afar region in the year 2003/2004 (UN-EUE 2002:7, ARSAP 2010: UNDP: 2003).

### **Frequency of drought**

The frequent droughts in recent years have meant that households have had no opportunity to rebuild their assets, including livestock, with many becoming locked into a spiral of chronic food insecurity and poverty. According to (Moreda 2012:4, Devereux and Maxwell 2001) the causes for the persistent food insecurity problems in pastoral areas of Ethiopia can be attributed to a variety of interrelated and complex factors. Yet Climatic hazards and environmental degradation are some of the main. For instance a report result from assessment of livelihood in the Afar region pastoralist communities displays that drought-related shocks used to occur seldom once or twice in ten years or so, in the area in past times however they are now occurring every year or two years or less (Joanne etal:1,Oxfam,2011:5, Belay Simane,2012:612).

According to surveys of local communities, the climate in the Horn is experiencing an increase in the rates of drought. Reports from the Kenya food security group and from pastoralist communities show that drought-related shocks used to occur every ten years, and they are now occurring every five years or less. Borana communities in Ethiopia report that whereas droughts were recorded every 6-8 years in the past, they now occur every 1-2 years (Oxfam, 2011:5).Consequently drought has become a common phenomenon in the Afar region causing very serious impairment on livestock production, the main source of livelihood for the pastoralists in the region. During the past 5 years, for instance, the region was hit by two severe droughts (Joanne, 2005:1).

Similarly the effect of climate change resulted in increasing trends in natural hazards in Somali region. In addition to repeated incidence of drought some parts of the region along the

Shebelle River have been affected by flooding. This caused temporary displacement of people, loss of crop and livestock, damage to other properties. Flooding has also caused for spread of pest infestation and water born diseases (CHF, 2012:6).

In nut shell frequency of drought in the pastoral areas has become a matter of reality. And drought is may be endemic to the dryland of the horn of Africa. For instance this assertion becomes plausible when one learn that between 1900 and 2011, more than 18 famine periods were registered in the region’s history. The most recent (2010-211) drought in the arid and semiarid lowlands (ASAL) of the Horn of Africa has rendered over 13 million people in need of food, and caused a devastating famine in southern Somalia (Derek etal., 2012: v, International Federation On Red Cross And Red Crescent Societies 2011:8, World Bank Group, 2011:1, EU, 2012:1-3, UNDP African human development report, 2012:12, Oxfam, 2011:6).

**Table1: Major drought events in Ethiopia.**

<b>Year</b>	<b>Number of people affected</b>
2011	4.5m
2008	6.4m
2005	2.6m
2003	12.6m

**Source: Economics of resilience final report**

**Unpredictable and sometimes heavy rainfall events:** The climate of the dry lands is characterized by scarce absolute rainfall which falls unreliably and within short rainy seasons, and which is often of limited availability for human use (Anderson et al., 2008). The dry lands are also characterized by substantial and unpredictable differences in total rainfall between years, within the year and even between areas in one year (Anderson et al., 2008). These make it difficult to plant and harvest crops and sometimes are partly responsible for causing flash floods. Floods damaged both crops and caused displacement of people in Afar, Somali and SNNP regions pastoral areas. They also result in a higher incidence of some human and animal diseases. From these it could be learnt that climate change has had negative impact on

pastoral community and contributed to the vulnerable livelihood pattern prevailing out there (CHF, 2010, UNDP, 2003, ARSCAD, 2010).

## **2.3. Empirical literature review**

### **2.3.1. Major debates on pastoral development Vis climate change effect**

#### **Overview**

Review of literature on the impact of climate change on pastoralism is characterized by an array of debate and contention among different writers. This contention can be categorized in to two. The first view is the view termed by some as pastoral pessimism (Devereux etal 2008) and the second and the counter argument to the first is the view that sees positive future in pastoralism Vis climate change. The pessimist view is the view that sees pastoralism as a way of life and production system no longer viable and is already in crisis. This view takes the recurrent drought that hit the horn and the subsequent loss incurred as evidence that pastoralism is unsustainable (Derek etal, 2012:1), thereby justifying strategies that aim to replace mobile pastoralism with sedentary agricultural production. Countering this view are advocates of wholesale protection of pastoralist livelihoods (Devereux etal, 2008:1-2). This dichotomy view to pastoralism in face of climate change is presented as follows.

### **2.3.2 The tragedy of commons and pastoral pessimism**

Pastoral pessimism rooted in the famous “tragedy of the commons” developed by Hardin in 1968. For many years, much of the literature has depicted pastoral production as economically irrational and nomadic livestock management systems as environmentally destructive. The old orthodoxy the dominant approach in terms of pastoral development (Stanford, 1983), described herders as individuals without economic rationale using harmful land tenure systems (Gomes, 2006:4).

The tragedy of commons theory, which influenced many policy-makers in Africa, assumes that: in pastoral areas, the herds are owned individually and the trekking routes belong to everybody and thus anybody; the pastoralists suffer from “the cattle complex” and irrationally accumulate herds for social and religious purposes rather than for economic purposes. This benefits the individuals and all the users assume the cost of over-grazing; and the pastoralists

are not able to create their own management institutions; the resource privatization is necessary and should be imposed from the outside.

Hardin's assumptions about free access land tenure regimes in pastoral areas were drawn from the "Game Theory" and most specifically from "The Prisoners' Dilemma". The idea in this theory is based on the assumption that "If two users in competition for the same common good have the choice between two strategies: conserve or degrade the resource, each of them will choose the latter assuming that if one of them conserves the resource, the other will cheat and use the caution of the other to maximize his profits. In these sense pastoralists communal use of resource destroys the scarce natural resource and leads to rangeland degradation. However this theory was criticized and rejected. This is partly because the assertions are irrelevant to the real situation in pastoral resource use (Victor A 2007:5, Devereaux, 2008:1).

Contrary to Hardin's assumption the communal ownership and management of natural resources are central to pastoralism because they ensure that herd owners can move freely as they search for water and pasture in different locations at different times of the year. The movement of pastoralists to areas of higher productivity has the additional benefit of alleviating stress on less productive land (Victor et al., 2007:5).

According to critics, this confused understanding of pastoralism has had a far reaching consequence adding to the vulnerability of livelihood among pastoralists. It has legitimated the imposition of modern range management systems and even privatization of rangelands owned by pastoralist in many countries in east Africa. This paradigm has been seriously questioned and is now recognized as the wrong base from which to establish future development for pastoral areas (Iona, 2011:30, Gomes, 2006:4).

Pastoral pessimism is basically emerged in academics and development discourse recently. Yet it shares the wrong assumption and doubt about viability of pastoralism with the "tragedy of commons" theory. Pessimists see pastoralism to be in crisis and the vulnerability of livelihood among pastoralists in the horn of Africa is best defined by Malthusian style crisis. The argument made is that, there are too many people in pastoral area which, combined with a

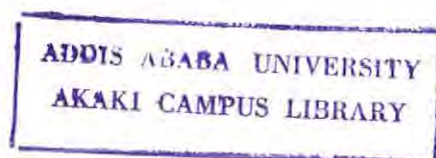
declining (or not increasing) productivity of the natural resource base, means that not enough livestock can be kept to sustain a viable pastoral production system (Sandford, 2011:5). This argument has been made by Stephen Sanford in “Too many people, too few livestock: the crisis affecting pastoralists in the Greater Horn of Africa” (Devereux et al., 2008:2).

Some of the major elements of the arguments of Sandford and others of pastoral pessimists are in the area people: livestock ratios have declined in pastoralist households to a level below 3 TLUs/person, deemed to be a ‘viable’ amount for sustainable livestock production, due to a combination of human population growth and declining rainfall. Real prices of livestock products have not increased (and are unlikely to do so, despite growing demand) to compensate for lower numbers per household. Pastoral economies remain poor, associated with limited circulation of cash, and so have little opportunity for growth through linkages to other income earning activities. Land for grazing and livestock production continues to be removed for cropping, and that this, particularly if supported by irrigation, is probably a better bet for many pastoralists anyway.

And finally with small and decreasing herd/flock sizes, sales remains focused on immediate cash needs rather than ‘commercial’ off take (Future Agricultures, 2008:2). Based on pessimist view of pastoralism today there have been emerging argument that call for Sedentarization of pastoralists. This group puts their argument for the advantage of settled agricultural production against pastoral production of livestock based on mobility (Elliot et al., 2011:3-4).

### **2.3.3 Positive view of pastoralism**

Pastoral positivism is also a recent view developed as a response to the pessimist counterpart. This view is growing and is based on many assumptions and facts about pastoralism. It is based on the argument that pastoralism is the dominant production system in the arid and semi arid lands and pastoralists use natural resources in dry land sustainably where other land-use systems cannot thrive. Pastoralism is uniquely well adapted to dryland environments. As an economic and social system, it operates effectively in low and highly variable rainfall conditions .Key elements of the production system are access to water and pasture and the



wise management of these scarce resources (ODI, 2009). This production depends on rational mobility to make use of natural resources, water and fodder, the availability of which varies so widely in time and space. Mobility enables pastoralist take advantage of the scattered rainfall in a way that no other production system does. Thus mobility is a key to pastoral risk management in drought (Little 2010:8, IIRR, 2003:6). Moreover mobile, as compared to sedentary, forms of land use is less risky as climate variability and the frequency of extreme weather events increase (Africa Union, 2012:6, Kate Wellard Dyer 2012:1, Oxfam, 2008: 2).

In relation to these Little (2010:4) indicated that with —global climate change becoming real, mobility will become more important. Some other benefits of mobility are: firstly it helps the ecology of the area by not keeping animals too long in one location; secondly it makes good use of available rangeland resources; and thirdly it allows herds to adapt to different rainfall patterns across territories;

As previously mentioned the positive view of pastoralism is emerged partly as a response to the pessimist view. But it is also resulted from the findings of various studies that show positive prospect of pastoralism in situation of deteriorating global climatic condition. In relation to this Isobel (2007) mentions that Since the 1990s, economic studies of pastoral production have shown it to be highly adaptable within time and space, and between two and ten times more productive than commercial ranching under the same conditions. More importantly pastoralism in Africa evolved in response to long-term climate variability thus pastoralism is by its very nature a form of adaptation to climate change, which has been demonstrated over Millennia (Brooks, 2006, Isobel, 2007:1-4). In other words for 7,000 years pastoralism has flourished in the dry lands because it is a rational, adaptable, tried and tested production system uniquely suited to them (ODI, 2009: V).According to Moritz (2012) pastoralism remains a viable production system for households and communities in the arid and semi-arid lands of Kenya and Ethiopia ( Moritz,2012:1).

Those who made counter argument against pessimist view contend that despite some truth in all of their arguments, pastoralist pessimism needs to be tempered by a number of under recognized facts (Devereux et al. 2007:1-2). First, pastoralism is undoubtedly a sector of

comparative advantage in the semiarid lowland regions of the Horn. These regions are characterized by relative land abundance but also by rainfall patterns that vary markedly across both time and space. Mobile livestock herds make efficient and risk-minimizing use of such an environment. Numerous studies have shown that mobility and trade are key to both wealth accumulation and drought management for pastoralists (ILRI 2010; Devereux 2006; Little et al. 2010a, 2010b, 2010c), and that mobile pastoralists appear to be significantly better off than ex-pastoralist or sedentary farmers in the same regions (especially farmers without irrigation). This has been also supported by Little (2008:20) findings of study on poverty in pastoral areas of Ethiopia. His finding suggest, encouraging herders to settle— often using food aid and education and health services as incentives — aggravate problems of local overgrazing and resource conflict, without generating many tangible gains.

The proponents of pastoralism admit the fact that climate will seriously aggravate the impacts of current challenges in the dry lands. But they support pastoralism because among other reasons, for them of all the natural resource-based land uses in the dry lands, pastoralism functions better within the context of wide rainfall variability and unpredictability. It therefore presents a more logical adaptation route than livelihood activities and land uses which do not have the advantage of mobility. According to ODI 2009, IIRR 2003, different land uses co-exist in the dry lands, but pastoralism is more resilient against climatic variability and change than others.

For proponents one source of pessimism of pastoralism emanates from wrong understand of *raison d'être* of mobility in pastoralism. Contrary to pessimists assumption today it is recognized by many writers and actors working on pastoral concerns that mobility in pastoralism is made with rational decision with a bigger purpose (Devereux, 2006, OCHA, 2005, little, 2010, AU, 2010:6 UNDP, 2007/8). Most pastoralists move between seasonal grazing areas, taking strategic advantage of different forage and water sources as they become available. Contrary to what is portrayed to be very few pastoralists are the wandering nomads.

Mobility in pastoralism is the reason behind pastoral sustainability and productivity. As demonstrated by numerous research studies pastoralists are experts at maximizing the use of

among sedentary pastoralists who may no longer be directly involved in pastoral production or those who are now exiting the system or probably will in the next few years(Ibid).

Contrary to what is presumed by many of those see pastoralism negatively, poverty is perceived as less prevalent amongst those who are able to be physically remote from urban areas and or those who are more mobile. This remoteness of a pastoral household from urban areas demonstrates that the household has the capacities to increase herd size, live off animal products and practice mobile pastoralism. In other words it implies that the food self sufficiency and livelihood security of this particular group. For those living a more sedentary life on the edges of small towns with few connections to the pastoralist system, on the other hand, poverty and livelihood insecurity is most likely. They can no longer function as pastoralists and have, in effect, become non-competent and, to a large extent, invisible as pastoralists. For the majority this was not viewed as a matter of choice but as a painful exit from welfare in the mobile pastoralism (Derek etal, 2012:3, Mary, 2010:31, Devereux 2006, and Little 2010).

The following quote from pastoralist women living on the edge of Gawane tawn in Afar region reveals this assertion:

*Before, we lived a good life, now there is no life. It's all poverty! I had many animals, milk, butter, but now there are no animals, no grass, no milk and no life. That's why it's different. If I had my animals I wouldn't come to town. When they died I had nothing left there. No husband, no animals, no life. I just came for my own survival.*

While this finding would appear to contradict mainstream understanding of livelihood security, which equates settlement and urbanization with improved livelihoods it strongly echoes data from recent qualitative and quantitative research (Devereux 2006, Little et al. 2008). These studies point to a nuanced model of livelihood security that associates mobile pastoralism with greater wealth, better nutrition and less vulnerability (Mary, 2010:31).

By the same token proponents of pastoralism emphasis the sustainability of pastoralism in dry land areas of Ethiopia and the horn compared to any other way of exploiting resources in the

area and managing the ecology and contributing greatly to the national economic growth and development. In addition as response to the pessimists the proponents of pastoralism go further and argue that pastoral livestock production is more productive than irrigation schemes that produce cotton and sugar. In this relation a study conducted by Behnke et al 2013 entitled “Counting the Cost”, compared the economic returns derived from pastoralism versus large-scale irrigated cotton or sugar plantations in the Awash valley of north-eastern Ethiopia. In this work Behnke et al, (2013) argued that mobile pastoral production is more productive and sustainable investment option compared to cultivation of cash crops of cotton or sugar cane .The analysis supports the following main conclusions. First in the Awash valley, pastoral livestock husbandry is more profitable than cotton farming. While private cotton cultivation may occasionally achieve rough productive parity with pastoralism, state cotton farms lost money for decades and their mismanagement has led to soil Stalinization, water logging, lost soil productivity and weed infestation. And second sugar cane cultivation presents much the same picture. On the favorably situated plantation examined in the study, cane farming equaled the returns to livestock in one of four years, and fell short in three of four years. Despite high levels of government investment and the expropriation of local communities’ land, there is no evidence of consistently higher economic returns per hectare to sugar cane rather than pastoralism (Behnke et al, 2013:33).

In fact similar argument has been made by Little (2010) where he argue that pastoralism is advantageous than irrigation schemes in low land areas. The economic viability of the irrigation schemes was viewed as uncertain. There was a great deal of skepticism that these would turn out to be viable commercial enterprises. Generally the sense was that the impetus behind this effort was not economic but motivated by the government’s concern with encouraging pastoralists to sedentarize and abandon mobile pastoralism. One participant noted that in the riverine areas —if a comparison is made between pastoral and irrigated farming production, the pastoral production will do better; the sectors are unmatched. Irrigation farming needs huge investment such as modern equipment and available water resources throughout the year. This makes cash crop production costly business compared to livestock production in the same area and under the same scarcity context (Little et al. 2010:6).

Another work related to the proponents of pastoralism important to mention is the reports prepared under the ECHO-funded project on 'Reducing the vulnerability of pastoral communities through policy and practice change in the Horn and East Africa' by Nassef et al, (2009). The report presents evidence-based research findings about opportunities and challenges of pastoralism in the horn of Africa. In its detail discussion the report makes three arguments that support the vitality of pastoralism to the state and society's socio- economic and environmental sustainability and development. These are briefly summarized in to three main arguments for pastoralism profitable business in dry lands.

Argument 1: despite chronic under-investment, the dry lands make a significant contribution to national economies. Under this argument the economic importance and contribution of pastoralism is detailed. From this the sectors contribution to livestock development in terms of the share of pastoralism to nation's income generation from livestock trading is emphasized to be vital. For instance 11 million of the 35 million cattle in Ethiopia are kept by pastoralists in the dry lands. Of Ethiopia's 42million sheep and goats, 18million are kept by pastoralists. Pastoralism contributes significantly to national economies. Twenty million people are estimated to have pastoralist livelihoods in the Horn and East Africa region (AU, 2010). The livestock sector represents 20% to 25% of agricultural GDP across Africa (Roger,2001:11, African Union, 2012:10). Significant portions of African livestock are found in pastoral areas (e.g. 70% in Kenya). This indicates that pastoralism provides a considerable amount of the red meat, milk and other livestock products in the region, as well as employing millions of people.

Pastoralism is also a source of huge wild resource to many countries in east Africa. Tourism is an important sector contributing a lot to the national GDP where the national parks and other protected areas fall predominantly within the dry lands. Tourism brings in annual returns of \$900m to \$1.2 billion to Tanzania's economy, represents 13% of Kenya's GDP, and over 9% for Uganda.

The dry lands as environmental resource: Dry lands ecosystems are valuable and unique (Wassie et al 2008:3). They are able to maintain soil fertility, hold water and maintain water

and air quality, control erosion, protect against storms and landslides, and also sequester carbon. These complex systems harbor key natural resources, including species adapted to dry land conditions. The degradation and/or loss of these resources would reduce climate adaptation and resilience options. Therefore pastoralism should be preserved and protected not abandoned or replaced by other livelihood hardly compatible to the dry land ecology.

Carbon sequestration is an emerging opportunity in the dry lands. Grasslands store approximately 34% of the global stock of CO<sub>2</sub> – a service worth \$7 per hectare. African grasslands extend to 13m km<sup>2</sup> and have vast carbon sequestration potential. This potential creates huge opportunity for investment in the wider range lands and generate huge amount of resource from carbon sequestration revenues. Capital investment in drylands in countries such as Argentina, Mexico and Israel reflects the value of these areas and shows that drylands need not be poor. It has also been shown that public investment in rain-fed dryland regions in India and China yield higher rates of return than in irrigated and more humid regions.

Argument 2: pastoralists use drylands rationally to fulfill their needs, the environment's needs and to contribute to the needs of nations. Pastoralism is a rational, adaptable, tried and tested production system uniquely suited to the drylands. Pastoralism developed autonomously across the world's drylands from some 7,000 years ago (Brooks, 2006:7). Pastoralism contributes significantly to the health of dryland ecosystems. Dryland ecosystem health is better where mobile pastoralism continues to be practiced effectively. Healthy ecosystems encourage the presence of the wildlife upon which the tourism industry is based. Contrary to the belief that pastoralism causes overgrazing there is little evidence that dryland pastures are generally over-stocked or overgrazed. In fact, much more pasture degradation is evident in areas around permanent settlements than in open rangelands where mobile pastoralists seasonally move their herds to allow pastures to regenerate (ODI, 2009).

Argument 3: pastoralist livestock-keeping has unique adaptive potential to climate change. The climate is changing of all the natural resource-based land uses in the drylands, pastoralism functions better within the context of wide rainfall variability and unpredictability. Therefore, it presents a more logical adaptation route as compared to land

## Chapter Three: Research Methods

### 3.1. General Profile of the Afar Regional State

#### 3.1.1 Biophysical features

Geographically, the Afar Regional state is located in the northeastern part of Ethiopia. The total geographical area of the region is about 270,000 km<sup>2</sup> (CSA, 2008). It is geographically located between 39°34' and 42°28' East Longitude and 8°49' and 14°30' North Latitude. The region shares common international boundaries with the State of Eritrea in the north-east and Djibouti in the east, as well as regional boundaries with the Regional States of Tigray in the north-west, Amhara in the south-west, Oromia in the south and Somali in the south-east. Administratively, the Afar National Regional State consists of 5 administrative zones (sub-regions), 32 weredas (administrative districts), 28 towns, and 401 rural and urban Kebele.

#### 3.1.2 General Climate Information

Afar is characterized by an arid and semi-arid climate with low and erratic rainfall. Rainfall is bi-modal throughout the region with a mean annual rainfall below 500 mm in the semi-arid western escarpments decreasing to 150 mm in the arid zones to the east. Afar is increasingly drought prone. The region receives three rainy seasons. The main rain, *Karma* accounts for 60% of annual rainfall and occurs from mid June to mid- September. This is followed by rainy showers in mid-December called *dadaa* and a minor rainy season during March – April called *Sugum*. Disruptions on the performance of any rainy season will impact on the availability of pasture and water as well as the overall food security situation of the pastoral and agro-pastoral communities (PARDB, 2007, Afar DPSIP first draft)..

#### 3.1.3 Livelihoods of Afar Pastoralists

About 90% of the regional populations in Afar base their livelihood on livestock rearing with limited irrigation agriculture along the river basins and low-lying riverine areas. The Afar keep multiple species and multi-purpose stock. They rear multiple species including cattle, camels, goats, sheep and donkeys (Ayele, 1986; Ali, 1996; Getachew, 2001). The proportion of the different species varies with the vegetation cover of the region. In parts of the region, in the escarpment and around the perennial rivers where the grazing resource is relatively good, cattle

pastoralism is also used by the community seasonally especially during dry season. The communities are exposed to multiple stresses including drought and its various disrupting effects.

### **3.2. Research Design**

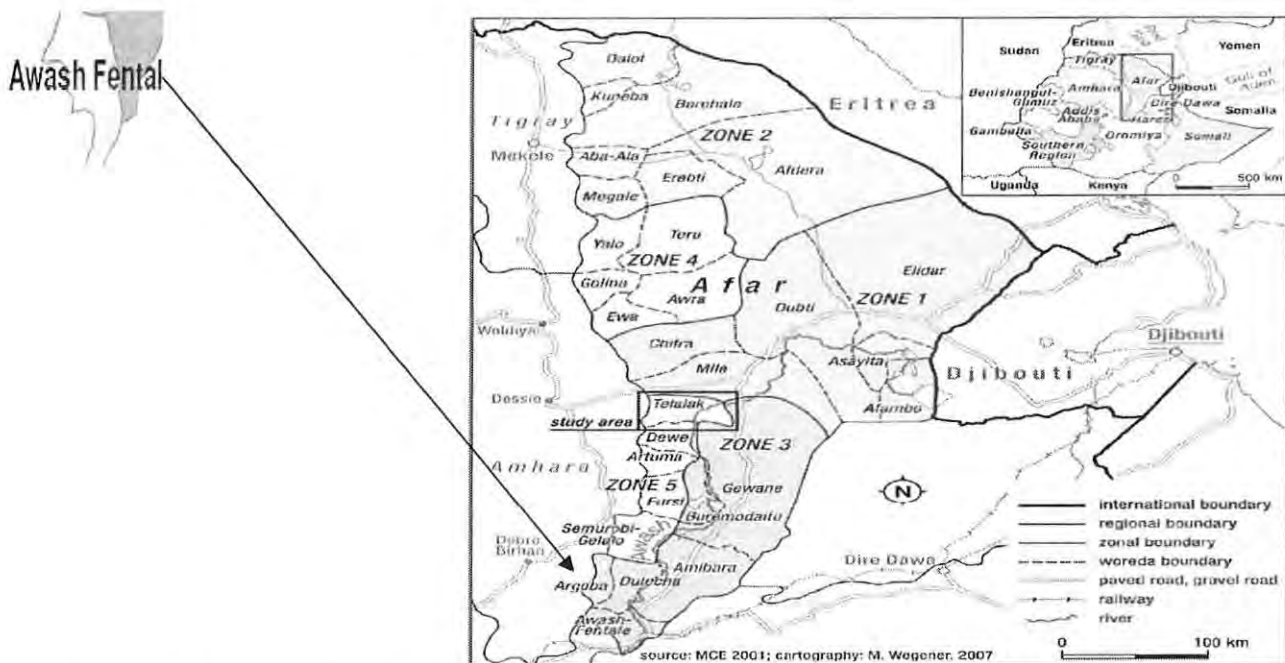
The study of the impact of climate change on the livelihoods of local populations is increasingly forwarded as an urgent research need (Morton 2007; Smit & Pilifosova 2003). A multitude of approaches and methodologies are used for this purpose. Among this the Vulnerability capacity assessment and sustainable livelihood approach are used as part of this thesis. The vulnerability and capacity assessment approach is a combination of the vulnerability assessment and sustainable livelihoods approaches (SLA). VCAs are carried out applying a gender perspective and paying attention to marginalized social groups (Mirjam M, 2011:1).

The objective of the VCA approach is to identify not only the key vulnerabilities of communities and the underlying causes of these vulnerabilities, but also the community's inherent livelihood assets and capacities, and then to suggest ways to strengthen these assets and capacities to enhance the community's resilience.

VCAs are mainly conducted at the community level, focusing on the experiences and perceptions of stakeholders from different pastoral communities. The general objective of a VCA is to improve understanding of how environmental and socioeconomic changes affect the livelihoods of rural, natural resource dependent women and men living in arid and semi arid environments, what shapes their vulnerabilities, and what assets they have for coping with and adapting to environmental and socioeconomic changes.

The main goals of a VCA are to identify the most vulnerable social groups and the underlying causes of their vulnerability, as well as to assess community-based coping and adaptation mechanisms to the past and current impacts of change in order to understand the feasibility of future adaptation initiatives and to formulate recommendations (for planners and policymakers) to improve individual and collective assets, with the aim of enhancing the adaptive capacity and resilience of vulnerable pastoral in their responses to climatic change (IBID, 2011:3)..

Methodological triangulation; obtaining data from different sources, such as observations, documentations and interviews, helps to harnesses diverse ideas about the same issue and assist in *cross-checking* the results, and consequently helps to increase the validity, reliability of the findings and eases data analysis (Bryman 2008; A. Rialp & J. Rialp 2006). This study obtains data from primary sources (field observation, household, government officials and local administrative interview).



**Fig 2: Map of the study area.**

### 3.3. Method of data collection

Mainly qualitative methods are suggested for collecting and analyzing data in community-based VCAs. Accordingly Qualitative data collection tool is applied. These are Participatory rural appraisal (PRA) tools of transect walk and observation together with focus group discussion (FGD), and interviews based on semi-structured questions. The primary data was collected from March –April 2014. Targeted data sources participated in FGD and key informants for KII (Key Informant Interviews) were purposively selected. The sample size was determined to a large extent by time and resource limitation hence purposive sampling method was used. 3 focus

group discussions covering issues of communities perception of changes, coping and adaptation mechanisms, effect of the change on social aspects, resource, access, control and activities profile of the target population was made. The average number of respondents at each of the FGD is 8. This provided in-depth information regarding the perception of each group regarding a particular theme.

Interviewing key informants and local residents in Awash Fentale wereda was the other important investigation technique applied during the field study, and findings from informant interviews carried out with local people in Kebele in Awash wereda constitute the bearing data and have been the main engine behind the development of this thesis. For all interviews an interview guide was developed, yet all kept a semi structured format. All interviews, both with key informants and locals, aimed at having a conversational style and encouraging interviewees to participate, as all interviews on top of seeking to cover a range of basic themes/questions as outlined in the interview guides, had a basic exploratory objective, aiming at learning more about the context at large.



**Fig: 3. women interviewee in Awash**



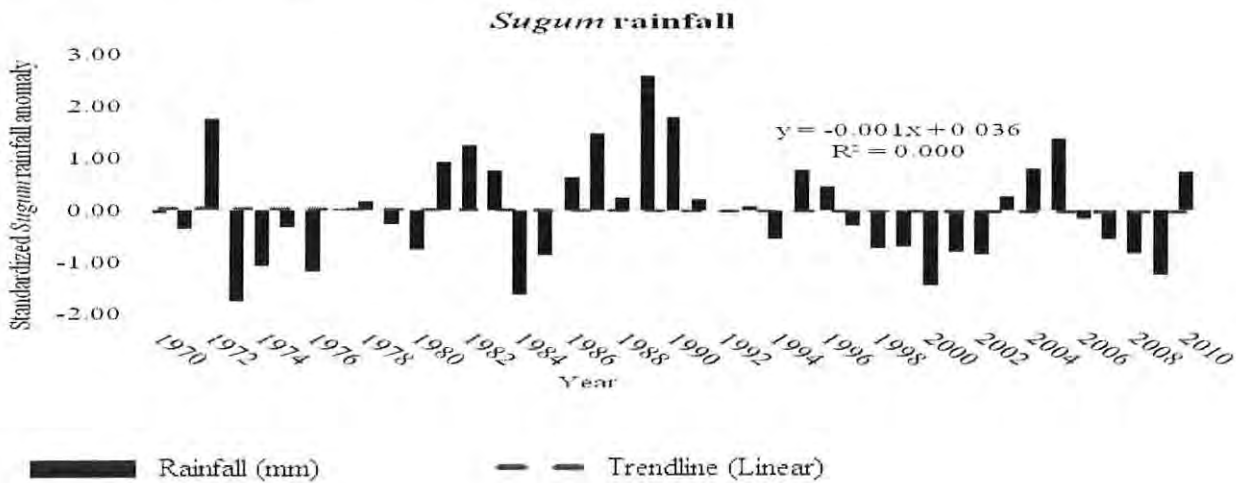
**Fig: 4. young pastoralist interviewee in Awash**

15 key informant interviews were carried out with a number of stakeholders and key informants, such as government officials and nongovernmental organizations working in the area, both before, during and after fieldwork in the case study area. Some interviews covered topics

before that day there was small precipitation in Awash and the area has become cool thereof. But the rain did not continue. This is how it is going, he continued saying “The rain may not shower today or tomorrow. But it must. Otherwise it will create problem on us”. The grass needs some more days to grow which is desperately needed in this time to feed cattle” (interview in Awash).

With the aim of comparing the perception of the community with the record and statistics by metrology agency a comparison on the community’s assertion of the decreasing trend in the occurrence of Sugum rain was made. Accordingly the graph of standard rainfall anomalies during Sugum season in the area reveal the high level of deterioration in the seasons rainfall especially since the year 1990-2010. The following data illustrates this clearly.

**Graph 1: Trends of Sugum rainfall (1970-2010)**



**Source: Tewodros (2011)**

As can be seen from the graph the overall trend in Sugum rain distribution in the area is characterized by high level of anomaly. The amount of rain recorded from the year 1990 to 2010 especially reveals that it has dramatically decreased. The years 1992, 1998, 2000, 2002, 2006, 2008 cover a period in which there is no Sugum rain at all. Out of the 10 record years six of them are with no Sugum rain the remaining recorded very minimum amount. Thus as in the questions the year emphasized was the last 10 to 20 years the communities perception to the change is compatible with scientific record.

**Box 1. Interview on the effect of climate change on rain season**

*“In the last 20 years the situation is that there is a time when no Karma or Sugum rain. This has had a devastating impact on the livestock and the farm alike. Livestock and human breeding are affected by the change”.*

(Interview in Alola kebele)

*The rainy season and livestock condition is in different scenario .Cattle; goats and camels are all deteriorating and decreasing in number. The change in climate is causing destruction on our livestock property. This is the curse of God. And we are surprised and watching this amazing change occurring around us. The effect of the change on our livelihood is much. We are in the middle of the problem caused by climate change suffering in one of worst manner. We do not know whom we may appeal for and inform our situation. May God forgive us for what we talk about of our problem and desperate condition caused by the change.*

(Interview with a woman 45 in Awash Hawas kebele)

**Source:** Own field report, 2014

**Table: 4 Observed changes in the rainfall condition in last 20 years as remembered by people.**

Change in Rainfall	Response /Yes /No	Women		Men		Total
		No	Percent	No	Percent	Percent
Rain season variability	Yes	9	100	15	100	100
Complete Failure of some seasons	Yes	8	80	12	80	80
Decrease in Amount of rainfall in all seasons	Yes	7	70	13	86	73
Early rainfall in all seasons	Yes	3	30	5	33	31.55
Delay of rainfall in some seasons	Yes	6	60	8	53.2	58

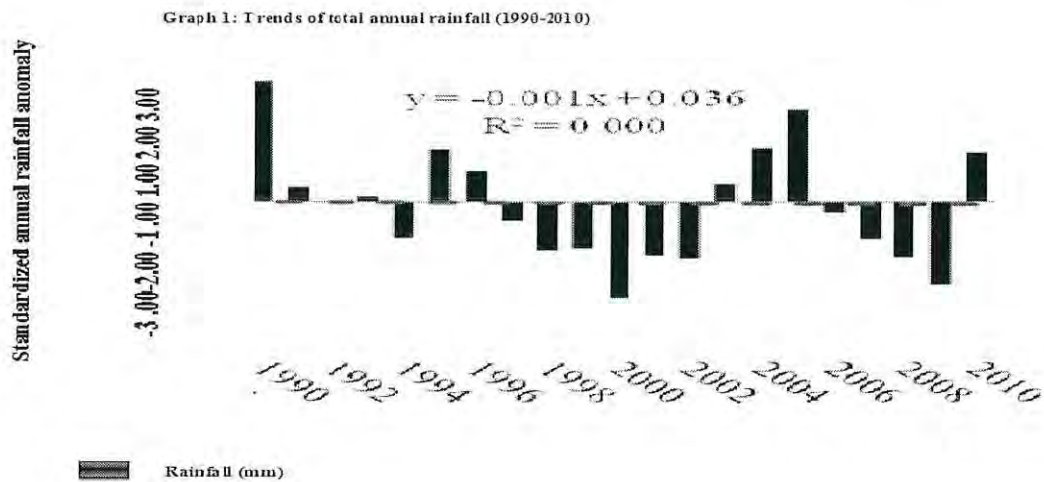
**Source:** Own field report, 2014

The table is result of focus group discussion which consist three groups which totally constituted 24 people. The total number of women in the group is 9.

Observation of the table result shows that all 100% of the respondents both men and women believe that there is variability in the season of the rain nowadays compared to it was known

before 20 years. And most 80% of all respondents also perceived the condition of complete failure in rain seasons in their area. In this relation the community has expressed that in the area there was six rainy seasons see the summery in table 3 above however due to the change most of these seasons have completely failed and the remaining kerma and Sugum rain seasons become highly variable see table 3 and graph 1 above.

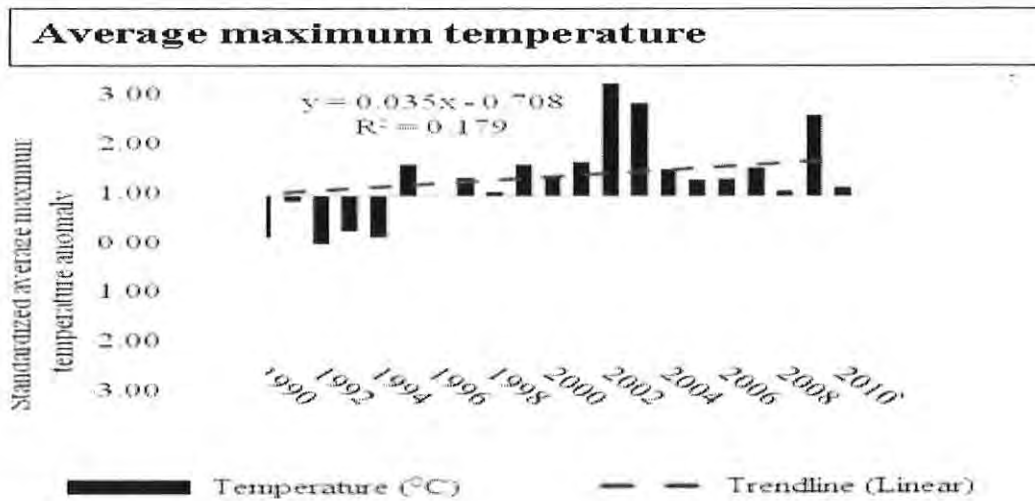
Graph 2.trends of total annual rainfall



Source:Tewodros ( 2011)

Its therefore discernible from the above reports and testimonies that the change in climate is a matter of reality for most of the informants contacted as part of this study and they have no doubt about it. Yet as to the question of why is this variation and loss of rainy season, there is variation in opinion, which is shaped by people’s belief, level of understanding and experience towards the issue. Accordingly some 6.3% associate it with change in time, others 8.5 % with climate change caused by industrialization damaging the ecosystem and the other majority 85% associate it with the curse of Allah (God).The following table reveals this variation in factors behind climate change as perceived by the community.

**Graph 3:** Trends of average maximum temperature e in the area in last 20 years



**Source:** Tewodros (2011).

## 4.2 Major impacts of climate change in Awash

### 4.2.1 Drought

Drought has been recorded in Afar region since 1988 and was recurring within an average of 10 years interval. However, during the past decade drought is occurring almost every year and the areas and population affected is increasing from year to year. The number of drought affected population in Afar region from 1999-2005 increased from 100,000 people in 1999 to 800,000 in 2005 (Oxfam 2005:18).

Climate change is the major cause of drought that cause death of livestock and erosion of Afaris asset base due to repeated incidence of drought. Many of the respondents took part in focus group discussion, and interviews confirmed that they have been personally affected by drought. They said that the last 10 years are called years of disaster (Amni).The latest drought event known and remembered are *Gaala sele* ,Uma sale and Lasale.

### **Drought is mass killer of livestock in pastoral areas.**



**Fig:6.Drought related death of livestock source [www.climate change pictures](http://www.climatechangepictures.com)**

Laasale is a drought that destroyed cattle and left camels and goats untouched which occurred in year 2007. During Lasale for example said an interviewee “I remember a situation that a man with 50 cattle left with only four”. He continues and adds that this drought that occurred in the year 1995 in Awash area destroyed cattle. Umasale drought destroyed and affected all kind livestock. *Gaala sele* is a drought in which ‘camels are finished in 2010. Since then the number of cattle owned per-capita decreased.

#### **4.2.2 Livestock and human disease**

The community mentioned the emergency of different livestock diseases some rarely known many unknown to the people in the area. According to many there was a time when camels diseases that starts affecting the camel from its head. Shakes it and nodes its head then the camel fell down unconscious. Then blood from its mouth marks its death. This new disease killed a lot of camels. And it was difficult to be recognized by professionals from agriculture office and this was occurred in the year 1995 E.C. according to 100 percent of respondents both men and women there has been increased incidence of livestock and human disease in the last 20 years (Own field report, 2014).



**Fig:8 Afar women keeping shoats** Source <http://www.sylvainsavolainen.com/en/photo/les-Afar>

#### **4.3.1 Effect on women work load**

In literatures written on the effect of climate change resulting in change in livelihoods of rural communities emphasized that as livelihood strategies shift, daily tasks and workloads also shift. Tasks originally delineated according to gender shift, confusing gender roles in communities throughout the world. Rural women typically experience an increase in workload as climate change impacts livelihood strategies (Agarwal, 2000).

Climate change has caused shortage in accessing of resources on which livestock survival depend. The lack of water and depletion of some grass species and herbs of livestock and camel implied mobility of the house hold in search of this to remote places. This implies in one hand women to build the house in the new settlement area. To do this they need to search for the required building materials which in most case in these days are hardly available. If this materials are not obtained then it means women become homeless. Moreover with climate change and lack of rain the distance covered for getting water has increased. The more the house hold become away from temporary settlement area the responsibility of feeding children at home will by default vested on their mother. Women also keep goats and sheep as well as the responsibility of fetching water is vested on women this created more burden on women. The following is interview given by a women in Awash as this related to the effect of climate change on the house work.

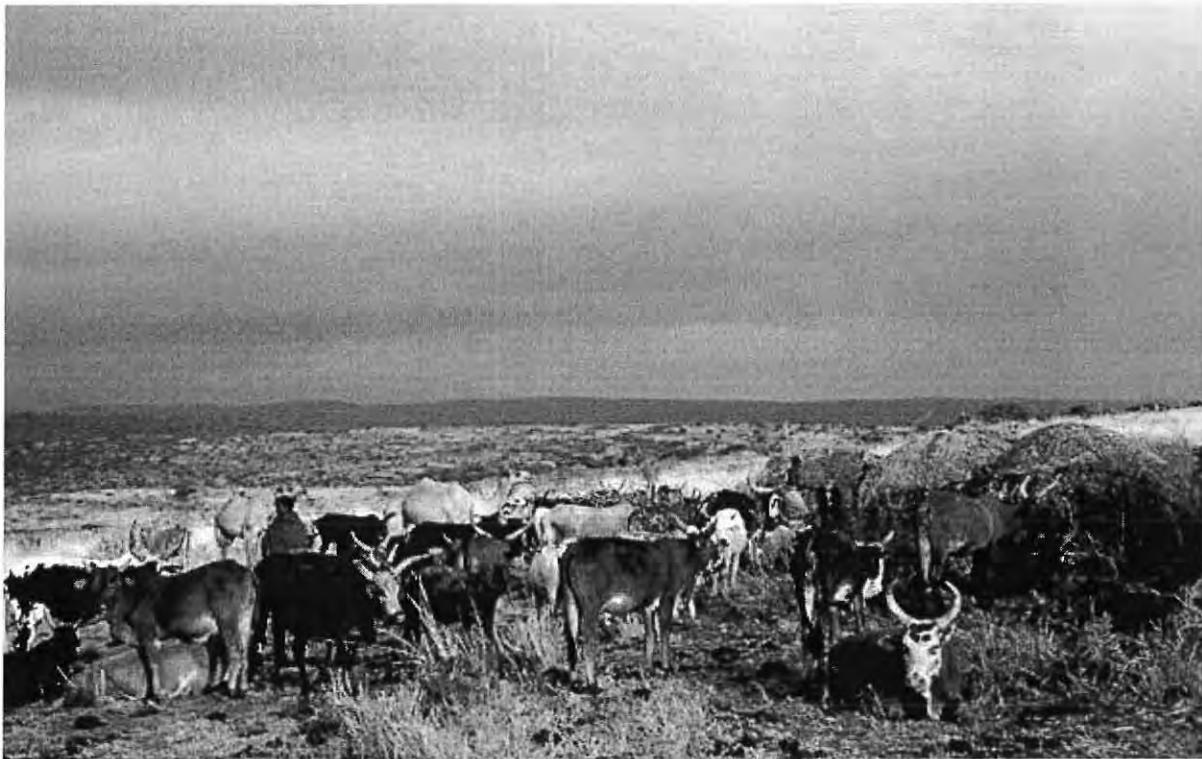
*“To get water for household consumption I wake up early in the morning at 6 am and I carry 25 liters of jerrcan of water in my back and as I reach home it is 6 pm ”*

(Interview in Alola Kebele in Awash )

Moreover, due to shortage of rain fall and shortage of livestock feeding a lot of problems are occurring. Lack of rain created stress on resources. Livestock become weak and seek. yrt there is problem in access to veterinary services as well as supplementary feed for livestock. In many of such conditions women become responsible to feed and treat sick livestock. To solve problem of the forage required and feed cattle, they engage in cutting grass from risky areas such as parks and carrying it to home. According to some of informants in previous times such problems have been solved by the government which used to provide support by transporting weak cattle to home and supplying with forages locally called frushka. The problem is still occurring and today cattle are dying due to shortage of feed and the government has yet stooped helping. So to feel this gap women are suffering a lot (interview in Awash ).



**Fig: 9 Afar women in Cut and carry feed from national parks. Source: Rural Development News ( 2/2010:35).**



**Fig: 10 Afar cattle grazing in plateau areas**

Among the Afaris the pasture is divided in to two. This division is of strategic importance and is of course coping mechanism. This division is called the Alta and Kalow. The Alta division is a grazing area usually mountainous and plateaus where the cattle are taken to during rainy season (see the above picture). At rainy season there will be good grass and shrubs for cattle and goat consumption. And there will be small water deposit of various rocks and stony forms called Hoboyle which will be used for both cattle and human consumption. And in this area and during the rainy time surplus milk will be obtained so everybody rush to it. Mention should also be made that this type of land form usually occupied by the Issa tribe. Still the Afaris go there to use advantage of the grass and water (Detona and Miftah 2014). So the pattern of resource and use in the area has changed due to climate change related reasons. The other important question raised in the resource use and control profile relates to whether there are any new resources that have appeared and that pastoralist have started to use (e.g., plants, animals, materials for energy production, and so forth)? Which ones? For what purposes does the community use them? And why did they start using these new resources? The answer is yes. There have

emerged new plant resource called *Prosopis* weed tree recently appeared in to the area and people are using it the how and why questions will be answered in the following part.

#### **4.4.2 Effect of *Prosopis* on resources access and control**

*Prosopis* (hereafter referred to as *Prosopis*) is a multipurpose dry land tree or shrub native to South America, Central America and the Caribbean (Pasicznik et al., 2001, Farm Africa 2008:7). It is an Exotic plant species which have been purposely and/or accidentally introduced throughout the world due to their economic, environmental or aesthetic values. During its introduction from its natives, South America, Central America and the Caribbean, the indigenous knowledge of its management rarely followed and *Prosopis* remained under-utilized and unmanaged .consequently and contrary to expected benefits of its plantation *Prosopis* has caused a lot of damages on livelihoods and environments across a wide range of agro-ecologies. Some of these are encroachment of rangelands by invasive species, reduction of crop yield, genetic erosion of biodiversity, disruption of water flow, poisoning of livestock, formation of impenetrable thickets, etc (Farm Africa,2008).

According to the report of Farm Africa *Prosopis* is affecting the biodiversity and socio-economic environment of invaded areas in Afar region. It takes over pasture lands and irrigable areas; people and livestock suffer from mechanical injuries by sharp and poisonous *Prosopis* thorns; indigenous trees and pasture species are lost due to the invasion; access roads are blocked; challenge from predators increases; unrestricted livestock feeding on pods poses health problems; agro pastoralists spend large amounts of money to clear *Prosopis* from their farmlands; and malaria cases increased due to the favorable microclimate created due to the invasion (Farm Africa,2008:8).

#### **4.5 Traditional environment preservation and management institution**

Pastoralists survival in the dry land areas of Africa in general and in the horn of Africa in particular attributed to various mechanisms of resource utilization embedded in the pastoral mode of production. One of the main reason cited most is the system of managing the scarcely distributed resources in the dry land areas. This systematic utilization of scarce resources are

realized through different resource use and conflict resolution mechanisms intrinsic to the pastoralism which functions on communal use of scarce resources. Without the presence of such institutions in the pastoral production the resource could have been vanished and the community hardly able to sustain. Almost in variably most of the pastoral communities in Africa has this institutions that help wisely use scarce resources .In addition to this the pastoral communities also has a conservation ethos that are developed over time. This is the main reason why in Eastern and horn of Africa countries of Ethiopia, Kenya, Tanzania and Uganda that most of the parks as well as wild lives of tourist attraction located in pastorally resided area. For instance among the Borenas of Ethiopia eating chicken meat or egg was seen as something taboo or not appreciated because the people see the chicken as bird which is wild life. The same ethics used to work for Rendile and Saburn pastoralist peoples of Kenya.

By the same token the Afaris have many conservation ethics included in their traditions and local institutions. From this, the importance of the Erena tradition of conserving the environment and managing scarce resource could be mentioned.

#### **4.5.1 Erena: Afaris environmental protection and natural resource management system.**

Among the Afaris there is a traditional institutional arrangement within the community for the management of- resources called Erena. It is known locally to be the law of the environment. It is also referred as a law and a lawmaking body. It has its own executive committee called Medabena. The president of Erena is known as Mekabentu. It has also information wing or minister entitled father of Erena The father of Erena usually collects information about those who cut trees or kill wild animals. When he obtains such information he makes announcement (Deero) that someone cut tree. Then he submits the case to the Medabena. And the president (Mekabentu) who chairs Medabena hearing the case finally decides the type of punishment to be taken against the one who breached the law and caused harm on the environment.

The function of Erena is many to mention some. First Erena is used to protect the right of wild lives particularly those of indigenous one. For instance according to Afaris tradition a person who killed a wild life called Bicida and Waydedo will be punished through Erena. The punishment first of all will usually be announced so that everybody hears it and then the case will be submitted to the council who decides on the case. By the same token Erena is used to

destruction. It is the youth that smuggle charcoal producers in to the forest for fear of condemnation from elders and community leaders. It is the youth who illegally levy tax on buyers and suppliers and the elders are not involved at all. On the other hand others doubt the validity of this assertion and comment that the young charcoal producers has created link or patron client relations with the elders, and the elders get some rent, and that is why they gave tacit recognition to such wrong action destroying indigenous trees in day light. This is probable today because the elders themselves are in need of resource and they are victims of loss of their productive asset to the invasive weed that made zone three of Afar region under its control.

This key informant seems to be shocked by what he sees or learnt in his study. He said “this is an amazing sorrow story untold going on in our area. The story is long and a volume of books can be written on”.

Some of the following are amazing things to Afar elders in zone three as it amazes elites and academicians. How come *Prosopis Juliflora* invaded these area, how Afaris lost all their land to the weed, how sudden it turned out that the wealthy pastorals around Awash found to be the most vulnerable.

According to this key informant everybody in this area has already lost its asset base. The elders and the youth’s asset base have seriously destroyed as they lost their land hence livestock to *Prosopis Juliflora* .The quality and quantity of milk is decreasing. Number of cattle and camels owned by per capita is deteriorating. Poverty is becoming rampant. The number of people that eat only once a day is increasing in shocking manner and the number of people that meet three times a day meal is becoming very few. Consequently today what matters most for most people in the area is getting money by any means. So the simplest way of ensuring this is engagement in charcoal business.

He further said “what happening in this area today is exactly the tragedy of commons” developed by Hardin in 1988. Hardin’s assumptions about free access land tenure regimes in pastoral areas were drawn from the “Game Theory” and most specifically from “The Prisoners’ Dilemma”. The idea in this theory as mentioned previously in the literature review, is based on the assumption that “If two users in competition for the same common good have the choice between two strategies: conserve or degrade the resource, each of them will choice the latter assuming that if

grass, shrubs and waters in oasis on which Afaris livelihood well being is dependent. And it is mentioned in literature review part that livelihoods sustainability has to do with a multi faceted aspects and levels of development a community has. This includes the level of socio economic and technological development of a community. And this in turn is fundamental in shaping the stage and standard of livelihood asset of a given community.

Livelihood assets are the main factors that affect people's livelihoods since they are determinants of a community's capacity to adapt to climate and socioeconomic change. In this sense the level of socio economic development among the Afar pastoralist in Awash in terms of the accessibility to human and fiscal infrastructure, the fragileness or potency of the source of employment and income and sustenance are of great importance in determining the communities' sustenance in one hand and bouncing capacity in face of disaster on the other.

As mentioned in the sustainable livelihood framework A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future while not undermining the natural resource base (DFID 199:1).

In light of this conceptualization, the poor level of socio economic development and the multifaceted limitations the pastoral areas have in terms of access to physical and human infrastructures the capacity of the pastoral community to bounce back stressors and cope hazards would therefore be very weak. This is especially true in light of the changing conditions in the magnitude and types of the stressors the society facing Vis climate change causing increased incidence of drought in the area.

#### **4.7.1 Change in household consumption and income**

Percentage of household's source of income and consumption from livestock and livestock products is one important aspect in defining livelihood among the pastoralists (IIRR, 2003, Roger, 2009). Livelihood among the Afar pastoralists depends on the number and types of livestock the household has in its disposal. For instance the owners of camels drink from the milk of camel and the cattle owner drinks milk of his cow in all of his daily meal. Afaris use different byproducts of the milk like butter, yoghurt and the like. So these were source of diet for the Afar household in previous times.

Climate change and food security are intimately linked. Climate change affects the general patterns of food security and particular issues of daily and monthly or yearly household's food consumption scenario. This includes short-term impacts of increased climate variability, and long-term impacts such as shifts in precipitation and temperature patterns, jeopardize the community's asset base productivity (FAO, 2010:1). In the same logic since the last 10 to 20 years in Awash areas of Afar region the climatic conditions has been changing. The change has been manifested by variation in patterns of rain fall and repeated incidence of drought events. According to many due to depletion in the productivity of cattle and camel milk product components of household food stuff has changed. Nowadays pastoralists use products of cereals like wheat, maize and teff etc together with milk in their daily food. On the aspect of source of income too pastoralist are no more depend on income obtained from selling livestock and its byproducts alone to sustain their life. Rather they are engaged in other activities including charcoal making, farming, trade and wage labour and other non farm non pastoral activities. The change in climate and the subsequent erosion of productive asset of the pastoralists has therefore resulted in changing the old way of doing things.

Many of the informants expressed concerns over changes in the climate, which had generally triggered a feeling of not being able to solely rely on livestock and the practical need for diversification of means of living through involvement in other income generating activities including on farm activities. A woman in Alola Kebele mentioned that she would prefer to keep a small herd size and complement the household's livelihood with engaging on farm activities. To this end she mentioned that she have already started farming in her compound area and recently she planted tomato and maize and she hopes with God bless this will be profitable. She says that:

*"If I am provided with the capacity and capital I prefer farming to pastoralism. In my compound area we are trying farming. We engage in tomato, maize and teff production. We are trying farming, given bless of God we need to work on agriculture. It has good result. Both livestock and farming are good so keeping both together is the best.*

(Interview with a women in Alola kebele in Awash )

2010:6 UNDP, 2007/8). Contrary to what is portrayed to be Very few pastoralists are the wandering nomads. Mobility in pastoralism is the reason behind pastoral sustainability and productivity. “Mobility provides the best strategy to manage low net productivity, unpredictability and risk on arid and semi-arid lands. Seasonal movements are essential for pastoralists to tackle marked spatial and temporal variations in livestock grazing resources while enabling pasture restoration at certain times of the year” (Nori et al, 2008:8).

The findings of this study is in compliance with these assertions that mobility is a rational decision by which pastoralist preserve the environment, increase productivity and ensure the sustainability of the wider ecology. For example in case of Afar community mobility, as a rational action is decided by consensus and mutual consultation of community leaders. That among the Afar pastoralist there is always a leading elder that directs and manages mobility and other operation activities on the daily basis. For example on each new sunshine on start before discharging the livestock to the field usually this elderly man collects surveillance reports from those in the field. Mostly the content of such surveillance report includes whether the “Alien” raider groups have been seen around and whether there is any threat that may harm the livestock well being at that particular day. According to a key informant who also conducted his study in this area observed the following situation relates to the strategy used in mobility among Afar:

*I have observed that on my stay with the pastoralist on the field on one of the days a report came to the elderly man that in the currently grazing direction the Issa tribes reported to have been prepared to raid the cattle of their Afari counter part. Based on this Intel the elderly man changed the direction of the grazing to the opposite of what was been on those days. Amazed I'm is in that I saw some of the cattle refusing to go to the new direction it seems that they have already made adaptation to the area which has by then fallen under security threat of the raid of Issa tribe.*

(Detona and Miftah unpublished work 2014).

Moreover, according to informants interviewed mobility among pastoral Afaris is also made based on some indicators like directions and nature of wind, cloud, rain and even of stars. However according to many Climate change has changed the pattern and frequency and distance covered to find pasture and water. This change takes at least two forms. For some mobility is becoming less important as they are forced by natural calamity to change their livelihood from mobile pastoralism to somewhat settler farmer/agro- pastoral or trader. On the other hand for those who still stick to pastoralism alone things are changing in to the odds and worst scenarios.

According to many the distance covered has a lot of difference compared to the previous times. Pasture is not available in nearby places. This relates to the variability of rain and precipitation due to climate change and the resulted shortage of grass. In previous times the grass and water was available in less remote areas and even in each tribes grazing areas which was not far away from temporary settlement area. But now a days due to change in climate these resources have become more inaccessible and available in very remote areas. Thus the people are travelling to remote area where it rains to find grass and water. This has many consequences on the well being of the pastoral household especially the women.

Moreover mobility in search of water and pasture during dry seasons among others usually causes conflict. An interviewee in Alola kebele to this end mentioned that “now a day’s mobility is creating conflict”. This is because of depletion of resource and competition for it. He mentioned a day before this interview, “conflict was to happen between two Afar sub clans in doo area and it was stopped by intercession of the elders. This was when an Afar sub clan Dabane moved and tried to settle and graze in another area controlled by other sub tribe”. According to him this kind of conflict (between two closer sub tribes of Afaris) were unusual in pervious times as there was enough pasture for all and used communally at least between to sub clans. In the pastoral mode of production each group and sub group has its own grazing area. And the norm was that conflict over pasture occurs between two different clans say between Afar and Issa or between Afar and kereyu Oromo. This is changing now and there has emerged a situation in which conflict between two sub clans to occurring (Interview and group discussion in Awash).



In addition to the aforementioned factors according to informants pastoralist mobility in this part of the region is also impeded by economic and policy factors. Mobility of pastoralist is limited in the park area and to the river sources is by those agents protecting the area for some investment and national development or security reasons. Some of the mentioned that they can't cross main roads to look for pasture since this is forbidden by people protecting the safety of the main road. So in light of the importance of pastoral mobility to the sustainability and productivity and other reasons its infringement or impediment will have a detrimental effect that threatens the raison d'être of pastoralism itself.

#### **4.8.1 Diversifying livelihoods**

Pastoral household income sources relates to pastoralism or livestock, dry land farming, and other activities different from farming and herding. The income from pastoralism consists of milk off-take for own consumption and sales, livestock slaughter for own consumption, livestock sales, and miscellaneous income from sales of hides and skins (Wassie et al, 2008:7). The non-pastoral revenue components include farm income and earnings from various non-pastoral activities. The sum of values of these product components then gives gross pastoral income. So one important indicator to assess the issue of diversification is via measuring the extent to which the households employment and source of income has expanded, changed or shrank over time.

According to 90% of informants contacted in previous times the livelihood of the pastoral community was dependent on livestock herding as the sole source of employment and income as well as consumption. But now the pastoralist started to engage in new activities like agriculture, small scale irrigation, petty trading, and involvement in daily labour activities and government works etc. That the trend in these days and in many cases is people mixing small farming with herding small size livestock and sources of household income no longer emanate from livestock alone. So in Awash area the issue of diversification of livelihood among pastoralist is at the stake (own field source 2014).

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Pastoral household income sources relates to pastoralism or livestock, dry land farming, and other activities different from farming and herding. The income from pastoralism consists of milk off-take for own consumption and sales, livestock slaughter for own consumption, livestock sales, and miscellaneous income from sales of hides and skins (Wassie et al, 2008:7). The non-pastoral revenue components include farm income and earnings from various non-pastoral activities. The sum of values of these product components then gives gross pastoral income. So one important indicator to assess the issue of diversification is via measuring the extent to which the households employment and source of income has expanded, changed or shrank over time.

According to 90% of informants contacted in previous times the livelihood of the pastoral community was dependent on livestock herding as the sole source of employment and income as well as consumption. But now the pastoralist started to engage in new activities like agriculture, small scale irrigation, petty trading, and involvement in daily labour activities and government works etc. That the trend in these days and in many cases is people mixing small farming with herding small size livestock and sources of household income no longer emanate from livestock alone. So in Awash area the issue of diversification of livelihood among pastoralist is at the stake (own field source 2014).

Moreover climate change, with its associated increase in frequency and severity of extreme events, can have deleterious effects on livelihood sustainability. This results in the alteration of livelihoods among the traditional community such as pastoralist. For example during an interview on livelihood options in Awash area a young pastoralist in 20s commented that both farming and pastoralism are good however “farming is becoming a preferable” way in light of the repeated incidence of drought caused by climate change, and change occurring in pastoralism itself. For him “farming is better because it could be developed by irrigation in around rivers and in areas where there is no water or river ground water could be used for irrigation purpose” (interview). In fact “Where climate change has burdensomely asserted itself, pastoralists and others who hold livestock are forced to seek new livelihoods activities” (Scones, 1998 and Frankenberg, 2003).

By the same token in the study area of Awash pastoralists who lost their livestock to drought or some times to raid are usually compelled either to give up their pastoral way of life or become either agro-pastoral or enter into small towns to find any kind of means of survival that could take many forms. Even in case settlement is the viable and possible option say in Sabure kebele it should however be underlined that in most cases it is the women, children and the elderly who actually settle, while most men remain mobile and herd the remaining cattle. For instance 90 % of the informants contacted in this study are active participants in herding though they still have some business in the small town, are part of a settlement and valorization packages under way or hired at wereda level office work and the like.

Based on their study conducted in Sahelian West Africa, Turner and colleagues explain that among traditional pastoralists, most families have adopted varied livelihood activities that differ from the traditional mobile pastoralism that is central to their identity. Instead, current livelihood practices consist of sedentary farming and livestock rearing as well as various income-generating activities (Turner et al. 2011: 184). So with changing environmental and climatic conditions pastoral communities are reducing their dependence on livestock gradually for instance by reducing her size, engage on extra pastoral activities, which in one hand implies change in livelihood and on the other hand it is one way of coping mechanism and part of societies effort to build their resilience. This is important development in light of the persisting believe among

pastoralists in keeping large herd size for prestige and the high propensity of livestock's to be destroyed by drought thereof.

However caution should be made that diversification and herd size reduction by pastoralist does not imply pastoralism to be unviable. Rather it is a mechanism vital to risk reduction in condition of disasters and tool to increasing the resilience of the community. And though proving whether pastoralism is viable in Awash area is not the purpose of this study, it has been clearly and crudely asserted in the literature review part that pastoralism is the most viable and productive way suitable to the harsh ecology characterizing the area.

The following is interview given by a pastoralist in Awash town which better illustrates the case.

*Farming and pastoralism are the same. Both are primitive production for subsistence. Both have their own advantage and disadvantage. What matters is not which way to follow but how to use it. What matters most is the inputs added to each to increase its productivity. Agriculture is better if it is done in proper manner. If people provided with the required input, training and technology that increases the productivity of the farm and the livestock herding both can be profitable business. But I can't say farming is better than herding because I don't have the experience of using farming as source of my living.*

(Interview in Sabure kebele in Awash).

This assertion was one of the most occurring during all discussions made. For overwhelming majority 80% (n-1=36) in situation where the appropriate and possible mode of production to the eco system is pastoralism, then the best way to increasing the productivity of the livestock is through mobility. A pastoralist understanding of rain is that it is not a thing that has constant nature. It is variable matter that occurs everywhere. So this by itself entails people to move in search of pasture and water of the rain that falls somewhere in the communally owned grazing area. They noted that the cattle themselves prefer a grass grown by rain water thus they

themselves prefer mobility. Thus livestock are the son of rain. They prefer to go where there is rain. They prefer where there is life, Where the rain brings the dead earth in to alive (field own data).The following is quotation better illustrate the case.

*Our livelihood is dependent on the environment and natural resource. And we could have the option to engage in agricultural activities through settlement .However according to our tradition we are a people that marry up to four wives and have the responsibility to fulfill the need of all these wives with their children. With engagement in agricultural production which we are less familiar with, we don't believe we could feed and manage these type of extended family of ours. However through herding we can manage them properly. Pastoralism is our way of life in which we have lived for years since our forefathers”*

(Interview with a community leader in Sabure kebele).

The interviewee emphasized on the issue of “marrying up to four through herding” in one hand to show the high concern the Afar pastoralist have to their values cultural and religious aspects amid preferring a given way of life. On the other hand it is their way of expressing how herding is a proved and productive way on which people have high dependence and deep believe despite some challenge they have experienced since recent decades. It also reveals that against all odds the people still depend on herding as a way of life and are less familiar on farm related activities and have limited trust in its viability. For them it is like “the devil you are familiar with is better than an Engel you don't know”. Despite the various facts and changes underway in pastoralism and the perceived, actual and projected condition pastoralists facing amid deteriorating environmental conditions and its associated impacts on them, most of pastoralist, ex-pastoralists and agro pastoralists contacted expressed a strong believe in pastoral way of life based on herding of livestock.

I found the following poem to best illustrate the mentality highly persisting among the respondents in this regard. It is a poem basically written on camel to show its value among Afar pastoralists. Yet it artistically tells us the whole picture of how pastoralists perceive things. How their conceptualization of farming and herding framed.

3	Mobility to plateau places	3	30	7	42.5
4	Engagement in Petty trade	7	70	8	48
5	Engage in production of charcoal	0	0	1	6.6
6	Small scale farming	2	20	2	13
7	food and forage aid	2	20	1	6.6
8	Social safety nets or kin support	6	60	9	54
9	Purchase of cereals	8	80	5	31.5

**Source:** Own field report, 2014 (multiple responses are possible)

According to many informants in this area, failure of Sugum rain or insufficient amount of rainfall in Karma or Sugum season usually trigger drought. This has immediate and tremendous impact in reducing livestock feed and water availability, and death of livestock. It also facilitates disease outbreak. These all jeopardize household food security and income. In response to such challenges Afar pastoralist use different coping strategies.

The Afar community has its own traditional coping mechanisms. During times of drought the community comes together to deal with issues of how to survive drought and other natural and manmade calamity. This involves discussion on deciding the direction of mobility in search of pasture, which should graze on reserved pastures, problems of anticipated flood solved by mobility and settlement in plateaus. Shortage of foods and other needs at household level is solved by sharing the one better off to those do not have. This mostly occurs between relatives and closer keens locally called Abino. This involve slaughtering of livestock ranging from goats to camels depending on the size of the family and the intensity of the problem and in a situation when it's impossible to get market for selling livestock. The mutual support also applies in case of lose of properly usually livestock due to raid or conflict. In the following table the different coping mechanisms out lined by respondents in all form of discussion has been summarized.

**Table10: perceived changes and adaptation mechanisms used by the pastoral community**

S/N	Community perception of change	Experienced impacts on Livelihood system	Adaptation strategy	Potential Future risks
1	Repeated incidence of drought	Death of livestock	Restocking, selling livestock, engage in non pastoral activities, migration	Growing livelihood insecurity

2.	High temperature linked to decrease in water availability	Failure of crop in small irrigation Lack of drink water for man and animal Lack of pasture Decrease land value	Sell of livestock's Buying cereal foodstuff Mobility Women fetching for water Using river water	Threat on livelihood
3.	Emergence human diseases	People become sick Impact on labour force	Traditional medicine Visit health facilities Government emergency program	Impact on the wellbeing or health condition of the community
4.	Delay of rain and less rainy days	Shortage of pasture water Increased distance of mobility	Mobility where there is rain, using reserved grazing	Increased food and livelihood insecurity
5.	incidents of flash flood	Destruction on resource, spread vector born diseases	Moving to new settlement places Settling on plateau area	Threat of disaster on livelihood
6.	outbreaks new animal disease	Death of livestock's Risk for human health	Government intervention, use of traditional medicine	Risk on livestock asset
7.	Restrictions on movement to other districts and cross international borders	Effect on coping drought	Changing mobility direction	Erode coping capacity of dry times
8	Problem in access to grass and trees and herbs for livestock	Increased distance of mobility. Conflict to access resource Decrease in livestock productivity Decrease in number of cattle Decrease in breeding	Mobility Selling of livestock Buying forage	Loss of biodiversity threat to livelihood Increased food and livelihood insecurity
9.	New invasive species Prosopis Juliflora	Destroyed pasture land Destructed farm land Increased charcoal business	Cutting the tree Making charcoal Making timber wood Changing the weed to other forms	Destruction of the asset base
10.	Resource use induced conflict	Threat of community relation	Peace building through traditional means	Threat to social relations
11.	Reduced number of all types of livestock	Reduced means of living	Engage in other activity	Threat to way of life
12.	High livestock mortality	Reduced means of living	Selling livestock Engage in new business	Challenge on livelihood
13.	Collapse of traditional resource use institutions	Cutting of trees Increased charcoal	Restoring cultural values and institutions	Threat to environment

		producers number Threat to biodiversity	by clan leaders	
14	High rate of forced withdrawal from pastoralism	Change in way of life Poverty vulnerability	Engage on farming Petty trade Waged laborer	Change from pastoralist to farm

**Source:** Own field report, 2014

Coping and Adaptation depends on developing resilience in the face of uncertainty. At the core of adaptation is the concept of resilience, which encompasses the abilities of countries, communities, households and individuals to cope with climate change. Traditionally, poor pastoralists have developed various forms of resilient livelihood to cope with a range of natural and manmade stresses and shocks (Wassie et al, 2008:2). And pastoralists have survived for centuries the effect of environmental change. However, as observed above the increased frequency of extreme weather, repeated incidence of droughts has put in threat the economic and social coping mechanisms and resiliencies the Afar pastoralist had". The old approaches of protecting the environment through mechanisms like Erena in Afar has become inadequate and obsolete viewed in light of newly emerging challenges in the area for example the charcoal business and the subsequent destruction of indigenous tree or the spread of *Prosopis Juliflora* and the loss of grazing pasture (Gordon, 2009:19).

In this sense the issue of climate change adaptation and resilience building in this part of pastoral and dry land areas of Ethiopia become imperative. Related to the poor level of socio economic and other infrastructural development and the resultant complication of the challenge to be faced, the action taken will therefore require a holistic and multi dimensional approach (Siri Eriksen et al, 2012:14). It needs additional investment on mainstream developmental activities on early warning, food security, WASH, health, livestock and education. Parallel to this action on disaster resilience activities as part of relief intervention is imperative (Courtenay Cabot Venton et al, 2012:18).

#### **4.9.1 Vulnerability & capacity assessment**

The interpretations provided by the social vulnerability school stresses that vulnerability is closely tied to a household's resource base and capability to act and respond to given stresses, and is not just related to climatic hazards, but to a range of stressors in the social realm. With climate change adaptation furthermore being tangled together with different 'adaptations' to

different sets of risk and opportunities, the study of livelihoods at the local level provides suitable entry points from which to investigate the characteristics of and processes driving vulnerability and adaptation.

Accordingly People’s lives, livelihoods, and wellbeing are at risk either directly or indirectly from the destructive effects of a hazard in one hand the socio economic and political conditions on the other. Thus as learned from the study in Afar area communities incomes and livelihoods are at risk because of the socio economic reality they are in one hand and the effect of climate change on this asset they owe on the other. In this case, elements at risk comprise people life and wellbeing, livestock, local systems and social structures, traditional coping strategies, and natural resources base. The process of creating vulnerability profile for Awash area pastoral community shall be based on a Framework that not only considers impacts driven by climate change, but also by non-climatic factors (environmental, economic, social, demographic, technological, and political factors) that may have beneficial and/or adverse effects on the exposure, sensitivity, and adaptive capacity of communities.

Accordingly four main vulnerability determinants of livelihood namely social, environmental, economic, physical factors were employed to conduct vulnerability assessment in the case in the study area. And the following table provides main elements of each aspect of vulnerability identified and observed by the community that took part in focus group discussion undertaken.

**Table 11: Summary of vulnerabilities identified by the community in group discussion**

Risk category	Vulnerability measurement/indicator factors			
	Economic	Physical	Social	Environmental
<b>Climate change related hazard</b>	Dependence on primary commodities of livestock for sustenance  Poor productive asset base	Poor level of infrastructure development  - Lack of development and relief projects that aim build capacity of the most vulnerable group	Population pressure  - high dependency on livestock which more susceptible to climatic hazards  - Weak adaptive	Limitation in dry land and environment development schemes  collapsing traditional resource use and management institutions

	poor networking and linkage		capacity	
<b>Environmental degradation</b>	Minimum opportunity for income  Fragile asset base  Lack of alternative	Poor institutions in resource management	Population increase pressure on scarce resource  Dependence of cattle on pasture	Lack of formal schemes to protect resource at local level  Weakening traditional institutions  Emergency of weeds destroying the land
<b>Outbreak of animal disease</b>	Poor access to care and treatment  Poor level of saving  Weak restocking capacity	Problem in veterinary services  Problem in access to livestock marketing centers	Erosion in use of local medication  Poor level of awareness	Increase in drought  Lack of water
<b>Spread of human disease</b>	Weak purchasing power  Limited access to facilities	Problem in access and using facilities	Poor level of behavior in medication	Repeated drought  Shortage of water and sanitation

Source: Own field report, 2014

## Chapter Five

### Summary, Conclusion and Recommendation

#### 5.1. Summary

As the world climatic conditions ever deteriorating, it becomes increasingly important to understand the impacts of climate change on human livelihoods. The overall objective of this thesis was to assess the effect of climate change on the livelihoods of pastoralists in Afar region of Ethiopia. In doing so it analyzes the relations between climate change, livelihood vulnerability and adaptation capacity. The research into climate change and livelihood is still in an early stage but some key points can already be made. Climate change posed an obvious challenge for states and societies in the world. For Africa and for developing countries like Ethiopia, the challenge is immense. This is because the country depends on natural resource exploitation for its economic survival. About 70% of the total area of Ethiopia is characterized as dry land and in this area about 12% of the total population depends on pastoral and agro-pastoral. Most of pastoralist resided regions and people are highly dependent on natural resources and the livestock sector for food, employment and income. Changes in climate damage the agriculture and livestock sector and this will thus have a major impact on incomes and livelihoods. Almost all of pastorally resided areas and regions of Ethiopia have already experienced hazards caused by climate change. And Afar is one of the most affected regions by the impact of the change.

The literature review (chapter two) presented a number of studies which have been written on pastoralism. And Climate change has become a major feature of development discussions about pastoralism. This is because pastoralist have been suffered severely from effect of climate change and it is projected that climate change in much of the arid and semi arid areas will be manifested in increased frequency and severity of drought and that pastoralists will more and more become victims. Projecting future climates in pastoral areas is also fraught with uncertainty. These projections of future climate in pastoral areas have led to a polarized discussion of impacts on pastoralists. On the one hand there is a fear, that pastoralist livelihoods, especially in East Africa, are fast becoming unsustainable: pastoralists are in danger of becoming “the first climate refugees”. On the other hand, there is a view, presented by NGOs and others that pastoralists are by their nature adapters, and if left to themselves will adapt, quite possibly more successfully than dry land crop-farmers (Little, 2010, IIRR, 2003, Brooks, 2006, Petersberg,

2010, AU 2010). Accordingly it has been clear that in one or another way climate change is important issue in pastoral development discourse and literature. The literatures reviewed also put into perspective. One of this was the pastoralist vulnerability perspective. Under this two contending paradigms have been detailed. These were the pastoralist pessimism and positive view of pastoralism. As the designation connotes the pessimist see pastoralism in threat Vis climate change and the positive view in contrary to the pessimist see pastoralism as a strategy vital to adaptation and as a sustainable way of life suitable to dry lands amid deteriorating environment. Parallel to this certain conditions and historical events that have had impact on pastoralism have also been put into perspective. This is including the impact of colonialism and the livelihood vulnerability perspectives. Major debates on climate change effect on pastoralism has been empirically presented and reviewed. In this section the development policies of Ethiopia to pastoralism and the countries policy on climate change Vis pastoral areas have been briefed.

Chapter three provided the methodological introduction of the research. Where the detail about the research design, study area, method of data collection analysis plus approach for data validation presented. As part of the study qualitative approach based on VCA and SLA used. Chapter four on the other hand provided introductory information about Afar regions topographic, livelihood and mobility issue. Chapter five of the paper provided the results and findings of the paper. The finding of the research is summarized based on some important thematic areas that helped to categorize the findings in systematic way. The first part of this discussed pastoralist's perception about climate change and the subsequent effect of this on their livelihood. The second theme was focused on socio economic vulnerabilities to climate change and variability. While the third sub section focused on climate change and livelihood vulnerability. The last thematic area focused on communities coping mechanism. The important elements of some of these thematic areas are briefly presented as follows.

### **5.1.1 Community perception to climate change**

The community's observation of the change has been found significant. The awareness level is high. But there has been different in opinion as what caused the change. The major indicators of the change were identified based on change in patterns of rainfall and change in rain season.

According to report of the respondents out of six rain seasons known in the area today only two of them occur in un regular manner and the rest four are already lost. In this regard it has been learned that the rain condition has showed big variation compared to previous times. To validate community perception, comparison with metrological report has been made and in almost all cases it is found to be compatible. By the same token the change in temperature observed has been significant.

Associated with this change is the occurrence of incidence and effect of drought on livestock and according to the community the incidence of drought has dramatically increased with burdensome impact. Many of informants noted that “the last 10-20 year’s area known to be decade of Amni or disaster”. Moreover a number of animal and human diseases are also identified. In sum these challenges has had far reaching consequence on the wellbeing and sustenance of the pastoralist’s livelihood. Associated with drought and lack of pasture and water is high livestock mortality occurred. Productivity declined. And among others many animal and plant grass species decreased and even lost.

### **5.1.2 Impacts of climate change in the Awash**

One aspect of this theme is the effect of the change on work division in the society. In this regard it has been identified that women have become more burdened in their work. Climate change has brought about new responsibility on women other than which they traditionally assigned, this new work include searching for grass and water for livestock. Moreover the lack of water has increased distance cover by women to collect water. 100 % of respondents confirmed to the decrease in water availability in last 20 years. Another aspect of this theme is change in access and control profile of resources. In relation to this a number of trees, shrubs, and grass species have been identified to have become in accessible and extinction. On the other hand invasive weeds have become common in the area. One of the most devastative of this aggressive trees identified was *Prosopis Juliflora*. This tree controlled the most productive asset of the pastoralist i.e. pasture. The expansion of this tree caused damage on land and grass availability in the wereda and also causing the expansion of charcoal business in the area with a distributive implication on indigenous trees destruction in one hand and affecting local environmental protection institutions like Erena.

The third component in this thematic area is climate change and its relation to vulnerability of livelihood. In this regard it is observed that climate change affected important values and means in pastoralist adaptation. One of this is its effect on restriction of mobility. Mobility patterns are increased for those pastoralists who are still in herding of livestock. This caused in many cases conflict with other Afar sub tribes competing for meager resources. More importantly the change aggravated the destruction of the pastoral asset base. For example drought kills livestock. Lack of water and pasture reduced productivity and fertility of livestock. So this erodes the peoples asset and forced them alter their livelihood. In addition the change caused forced migration from pastoralism to other non pastoral activities. This in turn implied change in source of employment, income and food.

The term used to express this situation is diversification. Yet even this is with a number of structural challenges and the task of adaptation through diversification is not to level it should have been. Diversification of livelihoods is constrained by deficiencies in physical health, skills and knowledge. Therefore, public spending and programs related to health, education and wellbeing can facilitate diversification in the future.

As a way of life that sustained in dry land environment pastoralism and the pastoral community had a tested mechanism of coping challenges from within and without forces. Some of the coping strategies identified as response to felt damage of climate change are including: use of reserved grazing areas, selling of livestock, mobility, and engaging on non pastoral activities including non agricultural one. On the top of these is the presence of a strong social safety net especially between near kin and kith that functions based on the principle of reciprocity.

## 5.2. Conclusions

Several overarching conclusions can be drawn from the summary. First People in the Afar region have lived with significant climate variability in the past and are likely to face increased climate variability and changing climate in the future. They have used a number of livelihood strategies as mentioned in the body and summary of this research. Yet adaptation depends on developing resilience in the face of uncertainty. At the core of adaptation is the concept of resilience, which encompasses the abilities of countries, communities, households and individuals to cope with climate change.

Traditionally, Afar pastoralists have developed various forms of resilient livelihood to cope with a range of natural and manmade stresses and shocks. These are social safety nets that are based on kin affinity. The other is social support tool that operates according to the principle of reciprocity. Erena is also the other mechanism mentioned and used in managing resources in sustainable and environmentally conscious manner. On the top of all these is pastoral mobility with its multifaceted rationale and importance that enabled all pastoral production systems sustain and thrive in the hard ecology for thousands of years. In this way pastoralists have survived for centuries the effect of environmental change. Their very existence testifies how this way of life is adaptive.

As pastoralists do most communities have some ability to respond to changes and extreme climatic events, the expected impacts of climate change will exceed this capacity almost in all cases. The old approaches of mobility and Erena may be inadequate, compromised and become obsolete viewed in light of newly emerging challenges in the future (Gordon 2009:19).

Vulnerability of livelihood among the pastorals of Ethiopia is also the result of the geo political and historical factors. The pastoral area historically have been marginalized and the governments and nongovernmental actors in the past have made little investment on basic physical and human infrastructure (African Union 2012:17, ODI, 2009:1, Kate Wellard Dyer, 2012: vii). This made the common future of the area to be poverty, under development and backwardness and vulnerability of livelihood. According to Ribot (1996), inequality and marginalization are among the most important determinants of vulnerability (Santiago: 2001:9).

### 5.3. Suggestions and Recommendations

The implications of these findings show that the Afar pastoralist's community is the community living under the continuous risks that made them more vulnerable to climate variability change. However, the community has been struggling to adapt the challenges they have been facing from time to time as the challenges are also changing from time to time.

Recent evidence in the climate change includes increasing temperatures and drought frequency, as well as unpredictable rains that fall in shorter but more intense episodes. The magnitude and rate of current climate change, combined with additional environmental, social and political issues, are making many traditional coping strategies ineffective and/or unsustainable, augmenting environmental degradation and food insecurity, and forcing communities to rapidly find new livelihood strategies. Besides the aforementioned challenges ties with climate change there are other non climatic variable that exacerbate the livelihood vulnerability among Afar pastoralists in the study area.

The result of the interviews and group discussions made in this study reflects that the community blames the variability in rain fall and the ever deteriorating situation in their asset base especially access to grazing land as they do the blaming on governmental intervention. They are also more compliant to the current condition in which they are. They tend to associate it with rainfall variability that makes them vulnerable to drought. And that nobody is doing anything to help them skip this worst condition in which they are. The implication I understand from the worry they have and the real situation the poor household today are in, especially the women, echoes that the issue should be seen beyond an academics and or development debate.

This is especially important given that most of the people contacted felt that what matters for them is not an academics obfuscation and intellectual judo of politicians and other development actors play on the issue of pastoralist development by wasting time and effort on question of which one is better, farming or herding. The answer is as one of the respondents said basically farming and herding are meant to be means of living for people. Both are two faces of the same coin. They are in case of Ethiopia or Afar “primitive mode of production which is dependent on rain fall”. Lack of rain affects potential farmers in Afar as it affects transhumance pastoralist.

And what matters is creating the environment in which peoples: pastoralist or farmers livelihood option are expanded, livelihoods are improved.

The contention on settlement or mobility of pastoralists continued between concerned policy makers and development actors. In the one side of the spectrum most development actors and practitioners as well as activist including environmentalist emphasized the need for greater caution from rushing in to settlement or disassembling the pastoral arid areas in to cash crop production schemes. To this end the associated arguments has been detailed in the literature review part.

On the other hand and at the other side of the coin there is a governmental policy that aims to settle pastoralists through process over time. To this end since the year 2004 E.C. there has been a program for villagization of the pastoralists around rivers. This program is by now in its third year and the achievement of the program is said to be successful in some regions like Gambela and Benishangul. While the report for Afar and Somali region is not as expected and is very poor. To this end the limitation in basic infrastructures has been mentioned by the ministry of foreign affairs. In any case it is clear from the statements made and documents assert the position of the government is to “stabilize” the wondering pastoralist livelihood through settlement and the subsequent provision of services (ETV prime news 8 P.M 25 May 2014 report by minister of MoFA).

In balance things seem to favor agro-pastoralism than the pure livestock herding way of life. As an interviewee in Sabure said given the reality ongoing in the area vis expansion of farms, governments policy on Sedentarization, the deteriorating climatic conditions and the already eroded pure pastoral way of life, farming and sedentary based business is more feasible and realistic or pragmatic option that is compatible with the socio economic and political environment of the day.

On the other hand a person like the key informant with a BA degree in environmental prefer to see things balanced. For him “The settlement of pastoralists should not be realized over night and above all not imposed”. Also at least for the sake of hedging and the uncertainty of what is

coming in the future amid deteriorating climatic conditions and ever changing world, there should be space for pastoral way of production in the region where this is the best option.

As some interviewee does many people men and women, the youth or elderly contacted and whose situation observed by me during the field study are in a mood undecided or “confused” its remind from the discussion made above women mother of 5 said she prefers farming to pastoralism given her “the appropriate training and capacity in terms of resource” and that she had already planted tomato and maize and waiting the blessing of Allah.

As I were preparing the first draft report of his study to be submitted on may 20 I were watching ETV prime news at 8pm in the evening. A report hearing by parliaments standing committee on emerging regions development affairs some issues of settlements in lowland regions was raised. In the middle of this, the report of Afar was questioned for it showed very poor result. One of the speakers said Out of 10,000 householders planned to be settled in the reporting period only 23% was achieved. And the minister was questioned why this poor performance? He left the question un answered and he replied the other night the reason to be related to the “poor level of institutional capacity and development in the area” (ETV may 20 and 22, 2014, 8pm prime news). This is in conformity of the finding of this research that vulnerability of livelihood in this area cannot solely be attributed to climate change effect alone. The change in climate and impacts of drought become catastrophic because the community has weak resilience capacity and the poor level of infrastructural development and accessibility.

In any case the community in the area has faced the devastating impact caused by drought. It has lost its cattle to drought, resources of grass are disappearing, and indigenous animal and tree species are also disappearing. The pastoralist has already lost their land to *Prosopis Juliflora* in zone three: to commercial farming and irrigation schemes in Awash. They are told by extension agents that farming is better way of doing things for survival in Ethiopia. They are trying to convince themselves of this. But they are little familiar with the how of using the land for living. So they deserve the right to be shown or helped to do it if in fact this is the best option possible vis climate change and sustainability issues. Person should be convinced and showed that how people can get marry up to four wives through agricultural production before rushing in to

simply to settle the pastoralist who already is self employed. Development is after all about a matter of change in behavior as behavioral school of thought contend.

#### **A. Recommendation to building resilience**

Key underlying drivers of vulnerability in pastoral and agro-pastoral communities in Awash and Afar region include environmental degradation; population pressures; conflicts; social and gender inequalities; inadequate non pastoral ,non farming employment opportunities and skills; poor access to infrastructure; resources and services; weakening of the role of traditional institutions are the major .The governmental and nongovernmental actors should aim to address these underlying drivers of vulnerability.

Interventions in the area should therefore aim to build resilient livelihoods by supporting investment in and development of key infrastructure and services. Construction of more school, their appropriate staffing, and provision of incentives for school attendance such as food for education programmes could be beneficial. Besides this crude measures some of the following are activities that deserve the attention of the governmental and other actors working in the area

#### **Enhancing climate change resilience for improved livelihoods**

Unpredictable erratic rainfall patterns have become common occurrences in the region. Most livelihood assets are and systems are rain fed; hence vulnerable. Crop growing conditions and seasons are becoming less predictable and there are increased livestock pests and diseases. Tackling observed and projected climate change impacts requires a coherent, integrated approach, which builds community's resilience or adaptive capacity. Climate change and variability has exacerbated these challenges heightening vulnerability of livelihoods in the areas. In order to cushion communities against climate change vagaries, proposed adaptation strategies should build resilience of communities.

#### **Improving climate resilient, water management system**

Dry land areas are known for water scarcity. This is compounded with impact of climate change where most parts of the region are experiencing prolonged drought, erratic rainfall, drying of

seasonal rivers and water springs among other water bodies. This affects both the agriculture & livestock sectors of the region that are vital to community's survival. The proposed action in the area therefore should focus on adaptation activities that will improve water resource access and utilization.

### **Strengthening capacity and knowledge management of adaptations to climate change**

Limited livelihood diversity, poor infrastructure and widespread poverty are some of the bottlenecks aggravating vulnerability in the area. The drought, coupled with natural aridity of the area has also resulted into rampant water shortage, widespread loss of local vegetation and severe pasture depletion. The situation will definitely further aggravated by the massive cutting of trees for fuel (charcoal) among others.

### **Suggested strategies to improving the livelihood of the community:**

- Strengthen and support diversification activities
- Addition of value to livestock products such as milk, through milk processing schemes to increase pastoral household incomes.
- promoting the effort to diversifying livelihood underway by the pastoralists especially women's in Awash
- Restoring and strengthening the Erena traditional institution for rangeland management and environmental protection endeavors
- Promotion and supporting farming practices where this is best suit;
- maintaining, rehabilitating and constructing water infrastructure for people and livestock
- investment on education; savings and credit; establishing community groups to building communities resilience capacity;
- Building social safety nets and institutions that are crucial to reducing resource induced conflicts.

### **To do away with the underlying drivers of climate-related vulnerability**

- ☞ Protect pastoral livelihoods and entitlements through solving impediments on mobility and investment

- ☞ enhance access to physical and human infrastructure
- ☞ improves social services in pastoral areas;
- ☞ reclamation of land from encroachment by Prosopis Juliflora
- ☞ protect the environment through forestation and land reclamation schemes
- ☞ Strengthening the institutional capacity traditional environmental protection institutions like Erena since it is threatened by people cutting tree for charcoal.

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<ul style="list-style-type: none"> <li>• What do you do when there is too much rain/water?</li> <li>– Ask same sub-questions as above</li> </ul>
<ul style="list-style-type: none"> <li>• What do you do when the weather is extremely hot over a long period of time?</li> <li>– Ask same sub-questions as above.</li> </ul>
<ul style="list-style-type: none"> <li>• What do you do when there is a flood?</li> <li>– How do you protect your crops, your animals, your children, and your houses and personal belongings?</li> <li>– Are these measures still sufficient today? Or what, in your view, needs to be done?</li> <li>– How long does it take you to get back to normal life after a flood?</li> </ul>
<ul style="list-style-type: none"> <li>• Have you introduced any new livestock breeds or given up using some?</li> <li>– If yes, which ones and why?</li> </ul> <p>What do you do when your livestock are sick? Affected by diseases? Do you have any remedies for this? Are these remedies still useful?</p> <ul style="list-style-type: none"> <li>– Who is dealing with this problem (you, your husband/wife, or the community as a whole)? Can you get any support from the community, from outside (e.g., extension services)? What kind of support would you need?</li> </ul>
<ul style="list-style-type: none"> <li>• What do you do if there is a prolonged period of food shortage?</li> <li>– Do you have to go to a moneylender?</li> <li>– Do you engage in off-farm activities?</li> <li>– Do you sell any personal goods?</li> <li>– Do some of your household members migrate? If yes, where to and for how long?</li> <li>– Do you get assistance from other members of the community or from outside?</li> <li>– What kind of support would you need?</li> </ul>
<p>6. Social capitals</p> <p>PRA tools: The following questions can be linked to the Venn diagram on institutions</p>
<ul style="list-style-type: none"> <li>• When you try to resolve these problems, are there any specific community groups or arrangements from which you receive help (e.g., when your livestock are sick , when there is a water shortage, when you need assistance because of food shortage, or you need money for a veterinarian or to see a doctor)?</li> </ul>
<p>6. Needs assessment</p>
<ul style="list-style-type: none"> <li>• Of the changes, problems, and challenges you have mentioned, which ones are the most important ones that you are facing in your daily lives at present?</li> </ul>
<ul style="list-style-type: none"> <li>• Do these difficulties differ from the ones you were facing 10/20 years ago, or from the ones that your parents were facing? In what way? What do you think the reasons are for these changes?</li> </ul> <p>Which strategies and mechanisms, do you think would help you most to alleviate the current difficulties you are facing?</p>
<ul style="list-style-type: none"> <li>• Who could help you to overcome these challenges?</li> </ul>
<ul style="list-style-type: none"> <li>• What do you think about the interventions that have already happened in your village (if any)? Which ones worked and which ones did not? Why?</li> </ul>
<ul style="list-style-type: none"> <li>• What would help you most to improve your life?</li> </ul>



## Declaration of Originality

Miftah Mohammed declare that this researches entitled "The Effect of Climate Change on Pastoralism in Ethiopia: The case of Awash" is the result of my own work. And this thesis has not been submitted to any degree, diploma or master program anywhere in any institution. In the research all authorizations are given due acknowledgment. The paper is submitted to Addis Ababa University in partial fulfillment of Master of Arts in Development Studies.


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SIGNATURE -----



NAME OF ADVISSOR: DR. MULUGETA ABEBE (PHD)

DATE 03-07-2014-----

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