

**The effects of climate change among the rural pastoral women and children in southern Ethiopia: A case study from lowland woreda of Borana zone**



**A Thesis**

**submitted to the Indira Gandhi National Open University in partial fulfillment of the requirement for the degree of Master of Art in Rural Development**

**By**

**Boru Jarso Godana**

**Program: MARD  
Enrollment No.: ID1216890**

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Addis Ababa, Ethiopia**

## **Declaration**

I hereby declare that the dissertation entitled “THE EFFECTS OF CLIMATE CHANGE AMONG THE RURAL PASTORAL WOMEN AND CHILDREN IN SOUTHERN ETHIOPIA: A CASE STUDY FROM LOWLAND WOREDA OF BORANA ZONE” submitted by me for the partial fulfillment of the Master of Arts in Rural Development (MARD) to Indira Gandhi Open National University (IGNOU) New Delhi is my own original work and it has not been submitted earlier, either to IGNOU or to any other institution for the fulfillment of the requirement for any other programme of study. I also declare that no chapter of this manuscript in whole or part is lifted and incorporated in this report from any earlier work done by me or others.

Place: Addis Ababa, Ethiopia

Date: November, 2016

Signature.....

Enrollment No: ID1216890

Name: Boru Jarso Godana

Address: Addis Ababa, Ethiopia

## **Certification**

This is to certify that the thesis, entitled, “The effects of climate change among the rural pastoral women and children in southern Ethiopia: a case study from lowland woreda of Borana zone”, has been duly compiled by Mr. Boru Jarso under my supervision to fulfill the requirement for the degree of Master of Art in Rural Development.

Name of Supervisor \_\_\_\_\_

Signature \_\_\_\_\_

Date \_\_\_\_\_

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## List of Acronyms

BZAO	Borana Zone Administration Office
CARE	Cooperation of Assistance Relief Everywhere
CC	Climate Change
FGD	Focus Group Discussions
GoE	Government of Ethiopia
GO	Government
GPDI	Gayo Pastoral Development Initiative
GHG	Greenhouse gas
HH	Household (s)
HHFS	Household Food Security
HS	Household Survey
HoA	Horn of Africa
IPCC	Intergovernmental Panel on Climate Change
ILRI	International Livestock Research Institute
KII	Key Informant Interview
NMA	National Metrology Agency
NGO	Non-Government Organization
ODI	Organization for International Development
PSNP	Productive Sefty Net Programme
PiE	Plan International Ethiopia
UNEP	United Nations Environment programme
UNDP	United Nations Development Programme
USD	United States Dollar
UN-ISDR	United Nations International Strategy for Disaster Reduction

## **Abstract**

The main aim of this study was to understand current underlining effects of the climate change on vulnerable groups with special attention to rural pastoral women and children in Yabello woreda of Borana zone, southern Ethiopia. The study employed cross sectional survey design and both primary and secondary data were collected to generate relevant information needed for the study. Interview questionnaire, focus group discussion and key informant interviews were used to collect the data. A sample of 120 (90 women and 30 men) was identified as respondents to the questions posed. Both qualitative and quantitative (descriptive statistics) data analysis methods were used to evaluate findings and draw conclusions and recommendations.

The study discovered that women and children are more vulnerable to climate change impacts than their men counterparts. Factors such as skewed gender division of labor that increased women workload, lack of access and control over resources, high economic and psychological dependency on husbands, drought induced migration, conflicts and stresses are responsible for exposing women and children to vulnerability of climate change. The community employed several adaptation strategies ranging from livestock diversification and rangeland management system to alternative livelihood/income generating options. The traditional social support system among Borana community is still in use but it is getting weakened. Climate change tends to decrease potency of local adaptive capacity. The study also revealed that there is a wide range of institutional responses that aimed at enhancing communities' adaptive capacity. However, these institutional responses/interventions are playing minimal role in addressing vulnerability of women and children to climate change due to various reasons.

***Key words: Climate change, vulnerability, adaptive capacity, adaptive strategies***

# CHAPTER ONE

## Introduction

### 1. Background

#### 1.1 Climate change and dry land ecosystem

With increasing recognition that climate change affects sustainability of economic and social developments worldwide, the subject is currently high on the agenda of international policy making, research and development (IPCC report 2007). There are now strong evidences, which show that the earth's climate is changing mainly as a result of the increasing concentration of greenhouse gases in the atmosphere that are emitted from various human activities.

The climate change represents a major threat for the coming decades, particularly in sub-Saharan Africa which has more climate sensitive economies than any other continent. Ethiopia is also not exceptional; pastoral areas of Ethiopia have become drier during the last few years and it is projected that the area will experience a stronger temperature increases, increased vulnerability, and frequent disaster, long-term and even persistent impacts than any time seen. Women and children have often been identified as one of the most vulnerable groups to climate variability and change because of multiple stresses and low resilience, arising from endemic poverty, weak institutions, as well as recurrent droughts and associated complex emergencies. Climate-related risks have significant impacts on their lives and economies and deepen the suffering of this group of populations and drive them to absolute poverty.

Climate change exacerbates the existing social problem in the society and will further undermine current efforts to reduce poverty and vulnerability, particularly in pastoral areas. Injustice and vulnerability in turn undermines the resilience of vulnerable populations decreasing their ability to cope and adapt to the consequences of climate change and their ability grow economically. The current drought in the Horn of Africa that triggered famine in Somalia and spurred food crises in other countries is an indication of what may come as such incidents become more commonplace, with extreme weather events having a higher probability of occurring as a result of climate change (Boko et al. 2007).

At a time when pastoralists face an increasingly precarious future, vulnerability is increased because for many social services are inadequate, inappropriate or inaccessible.

## **1.2 Problem statement**

Pastoralism is often in the frontline in respect to the impacts of a changing climate. We are now seeing increasingly frequent droughts and other disasters which are having economic but also profound social consequences. The rural pastoral women and children in Borana are at the greatest risk every time disasters hit the region including 2011 Horn of Africa droughts which left many destitute.

Various report and assessment shows that lowland woredas of Borana zone, including Yabello woreda, the research area, are the most affected woredas in 2011 drought; more than 300,000 animals reported dead and local livestock market prices collapsed and halted livestock breeding. In the area, crop yields, milk production, grain yields and pastoralist and agro-pastoralist nutritional intake are drastically reduced. Livestock reduction implicates long-term impacts such as heavy income losses and increased poverty rates in the affected woredas as recovery of herd sizes takes up to 5 years. Further impacts included, reduced food security and malnourishment of vulnerable groups such as pregnant and lactating women, elderly persons and children under 5 years and persons with disabilities ( Plan International Ethiopia and GPDI humanitarian response project report , 2011). According to Care Ethiopia's report (2009), due to their roles and responsibilities within the household and in agriculture, women are often limited in their ability to engage in alternative income-generating activities that could help raise them and their families out of poverty.

Despite the fact that drought phenomena has been recurrent in Borana and high vulnerability of women and children, no or limited study has been conducted so assess impact of climate change on pastoral women and children livelihood. Therefore, this research assessed the impact of climate change on these most vulnerable groups [women, and children] of pastoral communities in Yabello woreda of Borana zone. It also examined challenges, vulnerabilities and local adaptive capacities of the people and women in particular.

## **1.3 Research questions**

- What are women's perception and concerns (in comparison to men) of their vulnerability to climate change in Borana zone, Yabello district?

- Can existing climate change adaptation strategies reduce vulnerability of women and children to drought?
- What are institutional responses and challenges in enhancing pastoral women adaptive capacity against climate change?

## **1.4 Objectives of the study**

### **1.4.1 General Objective:**

- To understand current underlining effects of climate change on vulnerable groups with special attention to rural pastoral women and children in Yabello woreda of Borana zone, southern Ethiopia.

### **1.4.2 Specific Objectives:**

- To identify women's perception and concerns (in comparison to men) of their vulnerability to climate change in Borana zone, Yabello district;
- To examine whether existing climate change adaptation strategies can reduce vulnerability of women and children;
- To assess institutional responses and challenges in enhancing pastoral women adaptive capacity against climate change.

## **1.5 Significance of the study**

Pastoralists are becoming increasingly vulnerable (e.g., unable to cope with drought conditions) and as a result poverty is deepening due to unmet human condition, unequal social position and disabling conditions. Pastoral women and children are often in the frontline in respect to the impacts of a changing climate. Their voices, responsibilities and knowledge on the environment and the challenges they face need to be a central part of the solutions to a rapidly changing climate. It is, therefore, inevitably important to collect an evidence based data on contemporary challenges and impacts of these rapidly changing climate on pastoral women and children. The research will also analyze and document vulnerabilities and coping strategies of these vulnerable populations including recommendations to stay climate smart and have climate resilient community and institutions.

Hence, the information that will be obtained through the study is believed to help researchers who may have interest to be engaged in similar study while serving as a source of data. Above all, the study results and recommendations will have a paramount significance for policy makers, policy advocates, development planners and practitioners who may be in need of such information for reconsideration, evaluation and inclusion into their respective development and humanitarian programming and operational strategies.

### **1.6 Assumptions, scope and delimitations of the study**

It would have been the ambition of the study to cover wider area to better understand challenges of pastoral women and children in the face of climate changes, which will necessarily require much time, finance and large up-to-date and accurate data. The study will focus only on analysis of effects of climate changes on pastoral women and children in three kebelles of Yabello woreda of Borana zone. The research assumed that there will be limitations/constraints in these regards.

### **1.7. Organization of the thesis**

The content of this thesis has been grouped into six main chapters. Chapter one deals with an introduction encompassing the background remarks, statement of the problem, objective and the significance of the study. In the chapter two, literature review about climate change, conceptual framework and approaches are explained. Chapter three describes socio-economic characteristics of the study area. Chapter four explains the methodological approach used in the study. Chapter five discusses the results of this study. In the sixth chapter, summary and conclusion are presented.

## Chapter Two

### 2. Literature review

#### 2.1. Basic Concepts and Definition

##### 2.1.1 Definition of Climate Change

Climate change refers to any significant change in measures of climate (such as temperature, precipitation, or wind, etc) lasting for an extended period of > 3decades or longer. Climate change is resulted from: natural factors, such as changes in the sun's intensity or slow changes in the Earth's orbit around the sun; natural processes within the climate system (e.g. changes in ocean circulation); and, human activities that change the atmosphere's composition (e.g. through burning fossil fuels) and the land surface (e.g. deforestation, reforestation, urbanization, desertification, etc (ODI, 2011; IPCC 2007a).

The Inter-Governmental Panel on Climate Change (IPCC) developed rather a different definition of climate change with a leaning towards scientific assessments. According to IPCC climate change may be due to natural internal processes or external forces, or due to persistent anthropogenic changes in the composition of the atmosphere or in land use (IPCC, 2007). The National Oceanic and Atmospheric Administration (NOAA) brings a rather more simple to understand and use definition of climate change. NOAA considers climate as a long-time shift in the statistics of weather. It is not in the interest of this study to investigate into definitional discourse on climate change. Although, highlighting definitional dynamics serves right to setting ground for further discourse. Regardless of definitional disagreements, it is now evident that the global climate has been changing. Global mean temperatures over land and sea in addition to other various evidence serves to this effect. Evidence from the East African reveals even a faster warming and highly variable precipitation than the rest of the world (Nkomo et al., 2006; Christensen et al., 2007; Ziervogel et al., 2008), a situation for which Africa should take care and take necessary actions.



### 2.1.2 Climate Change overview

Over the last century (between 1906 and 2005), the average global temperature rose by about 0.7<sup>0</sup>c, which has occurred in two phases, from 1910s to 1940s and more strongly from the 1970s to the present and causing severe problem over the world, widely accepted that climate change is already happening and further to be anticipated (IPCC, 2007a) .

Many studies into the detection and attribution of climate change have found that most of the increase in average global surface temperature over the last 50 years is attributable to human activities (IPCC, 2001a).

In contemporary thinking the term climate change has become a core issue in various developmental, environmental, social and political forums at the grass roots, national, regional and international level (Akililu and Alebachew, 2009:13).

The Intergovernmental Panel on Climate Change (IPCC) in 2007 concluded that warming of the climate system was unequivocal and very likely (more than a 90% chance) caused by humans (Ares et al., 2009:1). The IPCC also concluded that global emissions would have to peak by 2015 and be reduced by 25-40% by 2020 and by 50-85% by 2050 to have a 50% change of limiting global temperature increase to 2<sup>0</sup>c.

Climate change is a global problem, but it has discriminatory effect on different communities, as there is disproportionate vulnerability among different demographic categories of the global population. The poor are more vulnerable to the ills of climate change, and women as the poorest of the poor are the most vulnerable. Of the 1.3 billion people living below poverty line, 70% are women. Of the 49% of the people in Sub-Saharan Africa living on less than 1 USD a day, over 60% are women. Therefore, owing to their poor economic condition, women are 14 times more likely to die than men during climate related disasters (Oxfam 2011 report)

Pastoral societies in East Africa have been plagued by recurrent droughts and extreme climate variability over the past five decades. According to a gender focused study in Afar, within the pastoralist communities, women usually have degraded social and economic position and climate change serves as a risk multiplier to this already degraded social position. Climate change has a

compounding effect on existing gender based inequalities and thus, climate change exacerbates the already existing inherent gender inequality and suppression.

The same study concluded that life was by far easier and better for women pastoralists four or five generations ago than those of today. Due to recurrent droughts and variability and subsequent drying of ancestral water wells, women pastoralists today have to walk long distances to fetch water and fodder for home staying livestock. Moreover, during droughts when traditional food reserves are exhausted, women take the sole responsibility of collecting famine food to feed the household. The increased need for mobility and migration during droughts, adds more burden to the already overloaded responsibility of women pastoralists, for example, in transporting household belongings and house construction at new sites.

### **2.1.3 Causes and impacts of climate change**

At global scale apart from natural conditions such as natural geologic, hydrologic, atmospheric and biotic factors, the main cause of greenhouse gas (GHG) emissions is from carbon dioxide (70%), primarily from burning of fossil fuel (petroleum) imported from industrialized countries, while the other sources for GHG are methane and nitrous oxide caused by deforestation and agricultural activities, particularly the use of pesticides (Akililu and Alebachew, 2009).

The IPCC report concludes that changes in the atmospheric concentrations of GHGs and aerosols, land cover and solar radiation alter the energy balance of the climate system and are drivers of climate change. They affect the absorption, scattering and emission of radiation within the atmosphere and at the Earth's surface. The resulting positive or negative changes in energy balance due to these factors are expressed as radiative forcing, which is used to compare warming or cooling influences on global climate.

The combination of generally increasing temperatures and shifting rainfall amounts and patterns will clearly have impacts on crop and livestock agriculture. Developing countries are generally considered most vulnerable to the effects of climate change than more developed countries, largely because of their often limited capacity to adapt (Thomas and Twyman, 2005 Cited in ILRI 2007; Akililu and Alebachew, 2009).

Among the poorest regions, Africa's biophysical and socio-economic environments are highly vulnerable to the impacts of climate change and weather extremes due to high dependency on natural resources and climatic sensitive livelihoods (Akililu and Alebachew, 2009).<sup>6</sup>

## **2.2 Climate change and Pastoralism**

Pastoral communities occupy most of the dry lands of Eastern Africa. Pastoralism is a viable livestock production system which supports the livelihoods of millions of pastoralists living in arid and semi-arid lands. Pastoralists in Ethiopia are estimated to inhabit about 61-65% of the country's land mass and constitute 12-13% of the total population (Yemane, 2003). Pastoral communities occupy most of the dry land areas despite these places are subjected to multiple man-made and natural shocks. Their reliance on arid and semi-arid land ecosystems challenges their livelihoods system and in turn makes them more vulnerable regardless of their own adaptive strategy and capacity.

The most important natural resources for pastoral communities are rangeland and water sources. These resources are the basis for livestock production. Drought that occurs from a lack of rainfall reduces both water and forage availability in the rangelands, which in turn threatens the survival of livestock (Rass, 2006). When these resources are threatened by drought, rangelands are lost through depletion and degradation and the livelihood of pastoralists suffer.

Their sole dependence on this livestock production has become a growing threat to their livelihoods as livestock entirely depend on natural resource for their nutrition. Therefore, the stable production system has now been confronted with numerous challenges. Climate change and its associated negative impact make rainfall unpredictable over space and time and therefore increase the vulnerability of pastoralists. Limited availability and access to pasture and water leads to resource competition and may in turn result in conflict. Given their dependency on livestock production, the conservation of natural resources in which livestock mainly rely on is extremely important.

Today, climate change and its consequences receive much attention in the public debate. It is thought that weather extremes (drought, floods, and storms) will occur more frequently in the future. Rising temperatures will favour agents of tropical diseases, or will speed up their development, and probably also contribute to their spread into new areas (Henson 2006).

People in the tropics that depend primarily on pastoralism are thought to be particularly vulnerable to the effects of climate change. For example, the Intergovernmental Panel on Climate Change (IPCC 2007) predicted that, in some of sub-Saharan countries, agricultural production could decline by as much as 50% by 2020. Similarly, UNEP (2006) has estimated that, by 2025, about 480 million people in Africa could be living in water-stressed areas. However, in a variable environment such as in the pastoral areas of Africa, trends of climate change are hard to detect.

Drought frequently hits the pastoral areas in east Africa, which pastoralists regard as ‘an act of God’. According to anecdotal evidence collected by Markakis (2004), drought cycles have become more frequent, shortening from ten to five years in the past and from five to three years at present. This directly affects the livelihood of pastoral and agrarian communities, as their income is directly dependent on rainfall (Gulilat et al. 2011). From the context of pastoral settings, drought implies two or more consecutive years when rainfall is less than 75% of the long term average (UNDP 2000). Pastoralism all over Africa, as a system directly dependent on rangeland resources, is threatened by increased drought.

Climate change in Ethiopia, as in most sub-Saharan Africa is manifested by extreme variability in rainfall and increased reoccurrence of drought. The Borana pastoralists of Ethiopia have been repeatedly affected by this climate change induced recurrent droughts which occur every few years.

### **2.3. Impacts of climate change on pastoral women and children**

Although climate change affects both male and female pastoralists, the impacts thought to have greater effect on women (Daniel, 2005). While women in the pastoralist societies of sub-Saharan Africa have historically been unprivileged, the marginalization of pastoralists as communities in general has overshadowed the extremely degraded position of pastoralist women (Daniel 2005). Of the 1.3 billion people living below poverty line in the world 70% are women (Denton 2002). Studies indicate that 28% of women in rural areas are moderately to severely under-nourished and of the 49% of people in sub-Saharan Africa living on less than 2 USD a day, over 60% of them are women (UNDP 2009b). Owing to their greater dependence on natural resources for survival and their close association with pastoral rangeland resources, pastoralist women and their children have specifically been vulnerable to the ills of climate change (recurrent drought)

and the traditional inequalities with men are exacerbated by the consequences of climate change (UN-ISDR 2008).

In developing countries, women's susceptibility to the negative effects of climate change has been compounded by their low educational levels, as a result of which many of the warning information doesn't reach women or women do not understand them (Alyson et al. Justina and Emily, 2008). In a study investigating the perception of women and men towards climate change, Dhanashri (2010) reported that, unlike men who had a humble knowledge of climate change, women were too unknowledgeable about it that it was difficult to elicit knowledge or perception of women on climate change.

Women's greater vulnerability to climate change can also be understood in terms of the numerous roles they play. Case studies conducted in South Africa and Nepal showed that gender differentiated impacts of climate variability was because of the unequal distribution of roles and responsibilities of men and women. It resulted into, women bearing the most burden resulting from climate variability impacts (Babugura, 2010). Existing evidence suggests that the demands of the roles played by women pastoralists become even more challenging during drought (Wawire, 2007; IPCC, 2007; UNDP, 2009a). With the increased reoccurrence of drought, pastoral women are burdened with more and more labor responsibilities. To illustrate, during extreme droughts, when livestock losses have impoverished households, it is the woman who feeds the family by gathering wild grains (Katherine, 2008).

Drought also results in reduced amount of available water and women and children (mostly girls) will have to face the challenge of walking long distance to fetch water (IPCC, 2007; UNDP, 2009a). In addition, the responsibilities of women increase during drought because of increased mobility (increased transport labor and house construction), and increased labor for collection of feed for animals (Lemlem and Yemane, 2007). Among the Borana pastoral group in Ethiopia, even less subtler changes resulting from recurrent drought, such as a shift from pastoralism to agro-pastoralism, has resulted in increased work load to women (Getachew, 2007). Moreover, as migration due to climate change caused disaster increase, so does conflict over land, water and other rangeland resources, and consequently increased the work burden of pastoral women and children.

## **2.4 Approaches to the study of impacts of cc on people's lives and livelihoods**

A multitude of approaches and methodologies are used to study the impact of climate change on livelihoods of local populations. There are three concepts that are continuously recurring in the methodological literature which was also used in the analytical framework developed for the purpose of this study. Therefore, the next section defines three of these concepts.

### **2.4.1 Impact Assessment**

Depending on the subject of the study literatures often use different terms and definitions for the term impact. Some of the terms include hazard, risk, or vulnerability (Brooks, 2003). To limit the scope of the study to climate change impact on women and children, the definition of biophysical vulnerability by Deressa et al. (2008), which refers to the extent of damage inflicted by climate change on livelihood and social systems, has been adopted in this study. The impact on livelihood (livestock tending and crop cultivation), and consequently on the vulnerable groups of the people, specifically, Borana pastoral women and children has been analyzed based on local climatic information, impacts, vulnerability and coping strategies by employing qualitative study.

### **2.4.2 Vulnerability assessment**

An impact study is most helpful when focusing on a single stressor, in this case, climate change (Nkem et al., 2007). Thus, impact alone is subtle and may not be sufficient to show the consequences of climate impact on different members of the same or different community (McCarthy, 2001). Thus, to evaluate climate change impact in the context of multiple stressors that reduce adaptive capacity, many of which are not related to climate or climate change; in addition, vulnerability assessment is also most helpful (Desanker & Justice, 2001).

Vulnerability assessment also “helps to inform decision makers to facilitate decision-making process of specific stakeholders of a sector about their options for adapting to the effects of climate change within the scope of their resources” (Nkem et al., 2007).

Vulnerability in this study is, thus, defined as the likelihood of households and communities in the Borana zone of Yabello woreda, Ethiopia, to suffer from climatic adverse impacts on their livelihood and their inability to respond to stresses resulting from the impacts. This definition is also in agreement with the definition of IPCC, where vulnerability refers to “the degree to which a system is susceptible to, and unable to cope with adverse effects of climate change, including

climate variability and extremes” (IPCC, 2001). To assess vulnerability of rural livelihood strategy in context of shocks and other stressors, Ellis (2000) used indicators such as asset (market, land holding, water availability, biological resources, social interconnectedness, labour or human capital, saving and credit availability) and asset access modification by social relations, institutions and organizations. Thornton et al., (2006) also used several natural capital, physical capital, human capital, financial capital and social capital to analyze vulnerability. As this study is exploratory, the selection of indicators or themes (or sub-indicators and sub-themes) is based on the analysis of responses from local society and previous vulnerabilities, how and why they are vulnerable.

#### **2.4.3. Coping strategies to adverse climatic impacts**

Societies are dynamic and they use all possible strategies to reduce the vulnerability to climatic impacts. There are two kinds of responses to crisis that overlaps across the temporal scale, coping mechanisms and adaptive capacity. Coping mechanisms are the actual responses to crisis on livelihood systems in the face of unwelcome situations, and are considered as short-term responses (Berkes& Jolly 2001). Adaptive strategies are the strategies in which a region or a sector responds to changes in their livelihood through either autonomous or planned adaptation (ibid; Campbell, 2008). Coping mechanisms may develop into adaptive strategies through times (Berkes& Jolly, 2001). However, it is difficult to make a clear distinction between coping mechanisms and adaptations and thus, this study consider both schemes as coping strategies (ibid.). The resilience or the robustness of coping mechanisms differ depending on the availability and access to resources and technology (Adger et al., 2003).

In this study, both local and institutional coping strategies are assessed from the collected information.

#### **2.5. Analytical framework**

To assess the vulnerability of arctic communities, Ford &Smit (2004) developed and proposed an analytical framework that employs focus group discussions of the indigenous communities and participant observations. The original model assesses vulnerability based on exposure to climate change and adaptive capacity in two phases: current vulnerability and future vulnerability. The technique was found to be effective on indigenous community researches in Arctic North America (ibid.).

Based on the analytical framework of Ford & Smit (2004) a model has been developed to assess the impact of climate change on livelihood, societal vulnerabilities and coping strategies (Fig. 1).

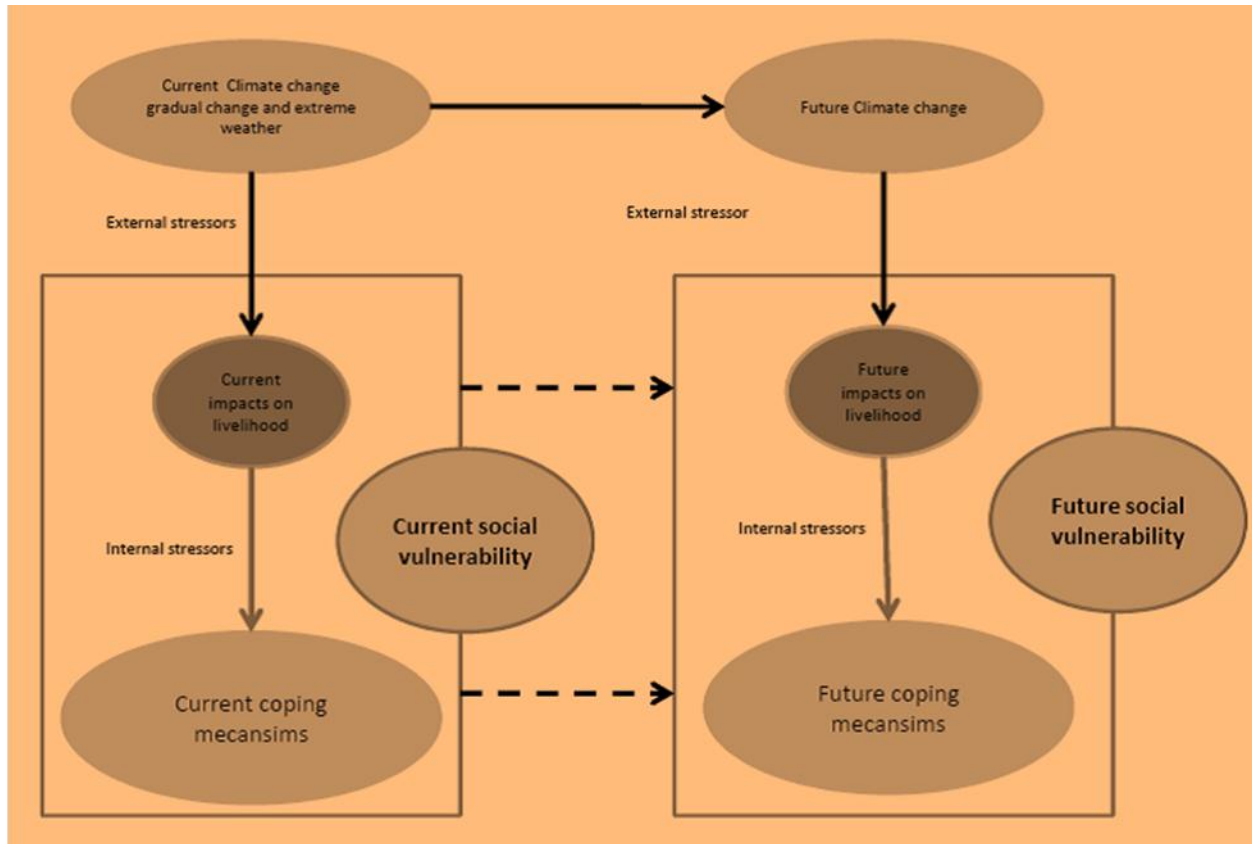


Figure 1: Analytical Framework

According to figure 1, climate change (gradual changes and extreme weather) causes an impact on livelihood and lives of the people. *As the situation deteriorates it has profound effects on women and children section of the population.* However, the ‘ *societies across the world have a long record of adapting to and reducing their vulnerability to the impacts of weather and climate related events*’ (Pachauri & Reisinger, 2007). Thus, the coping strategies used to reduce the impact and the presence of other internal and external stressors determine the societal vulnerability to climate change. Identification of the current climate change, its impacts on livelihood, current coping strategies and identification of vulnerabilities and stressors help to assess the future likely changes, impacts, coping strategies and social vulnerability.

The two crucial information source for regionally and locally specific climate change impact, vulnerability and coping strategies comes from local stakeholders and decision makers (Yarnal 1996 cited on Yarnal 1998) and data on earlier impacts (Titus et al., 1991 cited in *ibid.*).



Information can also be generated from content analysis of government reports, NGO reports, newspaper articles, and resource use managers (Ford & Smit, 2004). In this study, the current impact, vulnerability and coping strategies are assessed by collecting primary data from respondents (interviews and observations) and secondary data (and published and unpublished information). The data on climate change and impact on livelihood of people, women and children are also collected from local people interview, government officials, local experts and secondary data from government offices, NGO offices and other literatures.

## Chapter Three

### 3. Socio-Economic Characteristic of Study Area

#### 3.1. Description of study area:

Borana zone is one of the eighteen administrative zones of Oromia Regional State. It is located in the extreme southern lowlands of Ethiopia and situated between 3036'-6038' North Latitude and 3043'-39030' East Longitudes. Borana zone shares international boundary with Kenya to the South, regional boundaries with Somali Regional State in the East and SNNPR State in the North and North West, and a zonal boundary with Guji Zone in the North east (Fig. 2).

The zone is characterized by an arid and semi-arid climate, with pockets of sub-humid zones. The average annual rainfall varies between 350 mm and 900 mm with a considerable variability of 21 to 68% among years. Rainfall is bimodal, with 60% of the annual rainfall occurring between March and May (main rainy-season) followed by a minor peak between September and November (small rainy-season). The longest dry period from December to February is in “*Bona*” season and the cold dry months from June to August is “*Adolessa*” season (BZAO, 2010). The indigenous classification of climatic seasons corresponds to the measurements of monthly rainfall distribution.

The topography in the Borana rangelands is distinguished by plain rangelands, intersected with occasional mountain ranges, volcanic cones and depressions, and an altitude between 750 and 1,700 m.a.s.l. A particular feature is the supply of permanent water by the traditional deep wells.

The major livelihood systems of the people include pure pastoralism at large, agro-pastoralism and petty trading. The pastoralists in Borana are presumably the owners of rich and respected cultural heritage and customary institutions, in which they are invoking for local governance, rules and regulations of social relationship and resource management. Nevertheless, the indigenous knowledge and customary institutions to manage the resource have been adversely challenged by different external political factors and natural phenomena like droughts. The customary institutions still are regulators of the daily mode of life and providers of the guideline

in the livelihood of the wide pastoral communities. The Borana Pastoral communities have been very famous in basic indigenous knowledge and culture in which they are leading and shaping their social, political and economic life. On top of this the *Gada* System can be cited as one of their culture in which they manage resources, settle conflicts, rule and guide the rangeland utilization and natural resource conservation till this day.

The total population of the zone is 1,177,621 out of which the majority 1,006,672 live in rural area while the remaining 170,949 reside in towns. The zone is made up of 13 districts; where 10 are lowland and 3 are highland districts.

Yabello district, the research’s case study area, is one of the lowland districts of the zone. Yabello town is also a main seat for Yabello district and zonal capital located 575km away from Addis Ababa, along the main East-African (Addis Ababa-Nairobi) road.

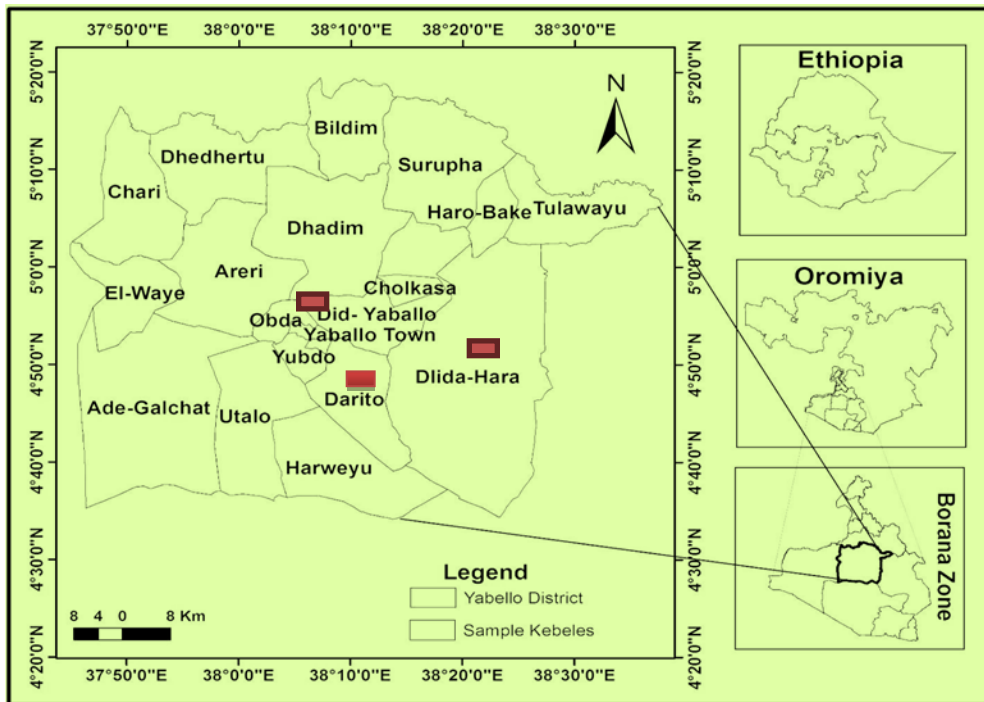


Figure 2: Map of the study area ( Borana zone, Yabello Woreda)

Source: Borana zone finance and economic development office

### 3.2. The human population:

The Borana people are a Cushitic speaking Oromo residing in southern Ethiopia and northern Kenya. The dominant ethnical group in the Borana land in southern Oromia is the Borana people - the eldest branch of the Oromo people and part of the Cushitic language family and other peoples of Ethiopia.

The social organization of the Borana pastoralists is determined by genealogy. Two clan moieties form a social division (*sabo* and *gona*), and 17 clans (*goosa*) constitute the descendent groups. The clans are responsible for the management of the deep wells, social security and ritual tasks. They are dispersed over the area, with a balanced representation in the traditional institutions and equal access to the natural resources. Ritual priests (*quallu*) are important clan representatives in spiritual endeavours and are also involved in political administrative tasks. Other clan authorities are messengers (*jallaba*), organisers of meetings (*abbaquaae*), and councillors (*hayyu*) obliged to the welfare of the clan members (Hogg, 1992, Helland, 1996).

The political organisation is under the *gadda* system, with strong social and cultural connotations. The *gadda* system is organized by generation-grades (*luuba*), which alter every eight years in assuming governance responsibility. The *gadda* defines rules, obligations and authorities, and thereby provides a framework for socio-political stability over long times. The origin of the *gadda* system dates back to the 15th century, and was founded by Gadayo Galgaloo (Huqqa, 1999). The *gadda* system operates through the Gumi Gaayo assembly, which is held every eight years at midway of the ruling generation grade. The Gumi Gaayo is the supreme institution for legislation, revision of existing rules and regulations, defense and conflict management, cultural instructions and social encounter. A multitude of development actors - governmental and non-governmental - can actively participate in the assembly. The *abbagadda* is a triumvirate of three selected leaders, with different responsibilities in governance and cultural celebrations (Legesse, 1973; Bassi, 1996; Helland, 1997; Huqqa, 1999).

## Chapter Four

### 4. Methodology of the study

#### 4.1 Data Type and Source

The study used both quantitative and qualitative data that were collected from both primary and secondary data sources. The secondary sources were books, different published and unpublished reports and journal articles. In addition, climate related information, such as rainfall and temperature trends, have been consulted. The primary data were obtained from agro/pastoral communities and key informants (elders, GO & NGO institutions).

#### 4.2. Sampling Design and Procedure

##### 4.2.1 Sample district:

The Borana zone has structured into 13(thirteen) districts. From among these, Yabello is purposively selected for the research because of acquaintance and ease of obtaining information. The woreda is easily accessible and one of the potential range system in Borana land that pastoral people depend during dry periods and thus, good opportunity to understand challenges of women and children during migrations.

**4.2.1.1 Sample kebeles and respondents (households):** The study has been undertaken in Borana zone of Yabello woreda. This woreda has 23 (twenty-three) kebeles. To identify sample kebeles and respondent household, a combination of non-probability and probability sampling techniques are used. Here, a kebele with significant mix of demographics such as age, rural, peri-urban kebeles were considered, therefore, based on this purposive sampling, Didahara, Harweyu and Dharito kebeles were selected as sample sites for the study. And similarly, 120 respondent households were selected based on simple random sampling technique (Fig. 3).

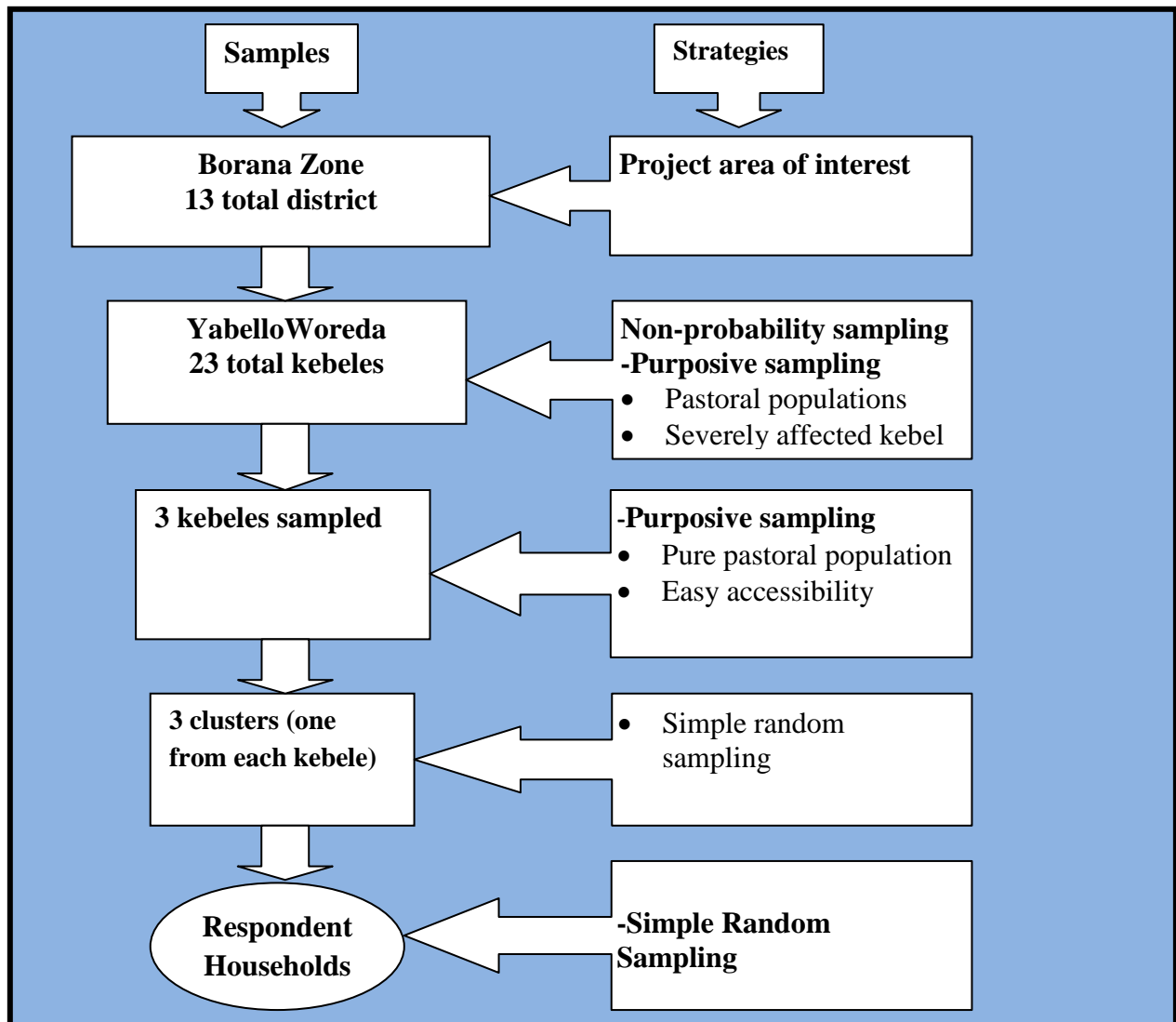


Figure 3: Sampling Strategy

Source: Own Design

### 4.3. Data Collection Methods

#### 4.3.1. Primary Data

Primary data was collected from 120 HHs sampled from 3 kebeles of Yabello district. In addition to household survey (HS), focus group discussion (FGD), key informant interviews (KII) and physical observation were used to obtain data.

**4.2.2. Household Survey (HS):** An interview was made with sampled households by using the open-ended questionnaires.

**4.3 Designing Questionnaire:** The interview questions mainly focus on climate change induced effects on pastoral women and children of Yabello woreda and it was designed and tested before administering. The integral aspect of the questionnaire was HH's profile, HH's experience in climate change, household food security situation (HHFS), climate change vulnerability and adaptive capacity, HH income sources, climate resilience, and its challenges and prospects.

**4.3.1. Enumerators' recruitment and training:** In order to collect data in a proper manner, the enumerators was recruited based on a set of criteria, such as educational level (who had at least completed grade 12); language (who can fluently speak Afaan Oromo and who knew local culture), and experience (who have participated in similar type of survey). The enumerators were given training for one day on the subject to familiarize them with data collection method for ensuring quality and consistency.

**4.3.2. Household interview:** After designing the survey and training the enumerators, the data was collected from sampled households (household head) by under strict follow up and supervision of the researcher.

**4.3.3. Key Informants Interview (KII):** Pastoralist household heads, elders, women, government officials, NGOs in the area who had substantial indigenous knowledge and good understanding of climate change and its impact on pastoral livelihood were interviewed.

**4.3.4. Focus Group Discussion (FGD):** To further triangulate responses obtained through interview questionnaire, in-depth discussions were held with groups of pastoralist people, both women and men groups separately. Six focus group discussions having seven (7) members in each group were conducted. Checklist of questions was used to assure similarity in guiding the discussion.

**4.3.5. Physical Observation:** The researcher has undertaken direct field observation where necessary.

#### **4.4. Secondary Data**

Secondary data were gathered from all relevant sources such as government, non-governmental organizations, internet websites/blogs and etc. through review of different published and

unpublished literatures & documents, such as research and project reports, magazines, journal articles, books, and etc.

#### **4.5. Method of Data Analysis**

The data that were generated from household survey was analyzed by using descriptive statistics such as mean, frequencies and percentages in explaining and describing the issues under study.

Qualitative method of data analysis was employed for analyzing data that were collected through FGDs, personal interviews, key informants interview, observation and case studies. Data were well organized and summarized and then qualitative/narrative method was used to describe the result.



## Chapter Five

### 5. Results and discussions

This chapter presents and discusses evidences of climate change and variability, induced hazards, and its impacts on pastoral women and children in the study area based upon results obtained from HH survey, and qualitative information generated from various groups of the community and concerned officials.

#### 5.1 Demographic Profile of the Respondents

The demographic profile of respondents is clearly indicated in table 5.1. Among the total household respondents included in the sample, 75% were female and 25% were male households. The livelihood basis (occupation) of the majority households (81%) of respondents was pastoralism and the remaining 19% were agro-pastoralism. Indeed, it is difficult to establish a clear demarcation between purely pastoral and agro-pastoral activities in the study area as households often go beyond any of these activities. Instead, the categories are made considering a focused and continuous engagement of the households in either of the activities (Table 1).

Descriptions		Frequency	Percentage (%)
Sex	Male	30	75
	Female	90	25
<b>Total</b>		<b>120</b>	<b>100</b>
Occupation	Pastoralists	97	81
	Agro pastoralists	23	19
<b>Total</b>		<b>120</b>	<b>100</b>
Education	Unable to read & write	85	70.8
	Can read & write	15	12.5
	Primary school (1-6) attended	9	7.5
	Secondary school attended	11	9.2
<b>Total</b>		<b>120</b>	<b>100</b>
Age	<35	20	16.7
	36-60	60	50.0
	60+	40	33.3
<b>Total</b>		<b>120</b>	<b>100</b>

*Table 1: Profile of the respondents*

As shown at the table above, the majority of respondents (83.3%) were 35 and above years old. This indicates that the respondents are old enough to know and inform climate change trends and impacts in pastoralist areas. More than 70% of the household heads were unable to read and write with no formal education of any kind. This indicates that educational services in pastoral areas have been very much minimal.

## **5.2 Climate change variability and trends in Borana zone**

The frequently experienced climatic shocks in the zone are prolonged drought and delay in the onset of rain, erratic and low precipitation, and unseasonal rainfalls even if the frequency and extent of the impact varies among different groups. The most recent major drought that hits the zone and marked in minds of many respondents was the 2011 drought. In the Borana oral history drought has occurred once in Gada period (8 years duration) without much effect in the livelihood of the community. Starting from Gada period of Goba Bule (1968-1976), the frequency and magnitude of droughts has been increasing over time.

According to Hon. Dr. Borbor Bule, one of the known oral historians of Borana, drought (*Oola in local language*) started in history of Borana during Gada period of Bule Dadacha (1776-1783). Then other droughts were remembered during Gada periods of Saqqo Dadacha (1814-1821), and Guyo Boru(1885-1891) which was locally named by *oola qolajji* . During those Gada periods drought had occurred once in eight years. According to this historian, it was during Gada period of Goba Bule (1968-1976) that drought occurred more than two times within one Gada period. Starting from this Gada period drought became recurrent in nature even if the frequencies and magnitudes varied. Again other droughts have occurred during Gada periods of Jilo Aga (1976- 1984), Boru Guyo (1984-1992), Boru Mada (1992-2000) and Liben Jaldessa (2000-2008) (Annex I).

To further identify respondents understanding of climate change, they were asked to rate the type of climate changes that have been observed in their environment using 1-5 points Likert scale. Accordingly, the following table indicates respondents perceived climate change (Table 2).

Table 2. Respondent's perception of climate changes

S/N	What type of climate changes observed in your area?	Mean score	Rank
1	Drought	5	1
2	Increased temperature	4	3
3	Flood	2	4
4	Rainfall variability	4.5	2

Source: Survey Result, 2015

According to the table above, the most critical types of climate change in Borana are drought and rainfall variability, followed by increased temperature. According to FGD conducted, these three factors are interrelated. Therefore, drought is characterized by high temperature and shortage of rainfall. Hence, climate change in this study mainly refers to drought that will include lack of rainfall and rise in temperature. Moreover, the study result also indicates that flood is not common in Borana. However, according to key informant interview there was a time when heavy rain resulted in excessive flooding which devastated crops and vegetation and also had contributed to land degradation.

### 5.3 Women and Children vulnerability to climate change

Gender is primarily a social construction and as such embodies in it social norms, expectations, and roles which men and women fill in the society. Gender, therefore, determines what is expected, permitted and valued in a woman's or a man's behavior in a specific context (Giddens, 2006). Whether climate change affects women differently than men, there is mounting evidence (Denton, 2002; IPCC, 2007; UNFCCC, 2007) suggesting that women suffer more from climate change related problems than men do. Therefore, this study attempted to assess how Borana pastoralist women vulnerability to climate changes as compared to their men counterparts.

Before discussing the details on nature and effects of climate change, an attempt was made to know respondents perception of women vulnerability. According to the survey result, 83.33% of respondents believe that climate change negatively affect women and children more than men (Table 3).

**Table 3: Respondents' Perception of Women and Children vulnerability to climate change**

Question	Responses	Frequency	Percent (%)
Climate change does negatively affect women & children more than men	Strongly disagree	0	0
	Disagree	0	0
	Neutral	20	16.66
	Agree	20	16.66
	Strongly agree	80	66.67
	Total	120	100

Source: Survey Result, 2015

The above table also indicates that relatively small proportion (16.34%) have asserted that they are neutral with the statement. This implies that though the majority of women and children in most cases are highly susceptible to negative effect of climate change, there are some situations where men are equally affected. The result of FGD revealed that situation may differ from person to person based on coping strategy employed, level of assets accumulated and extent of cooperation and understanding between husband and wife.

### 5.3.1 Causes and effects of Women and children vulnerability to climate change

To fully understand the nature of women and children vulnerability, respondents were asked to rate different factors causing vulnerability through survey questionnaire. Then, each factor had also been evaluated through FGD and key informant interviews. Also, the implications of each item on livelihood of women and children have been discussed thoroughly (Table 4).

*Table 4: Factors causing vulnerability of women & children to climate change (multiple responses possible)*

Do you think the following Factors cause vulnerability of Women?	Male				Female				Total				Rank
	Yes		No		Yes		No		Yes		No		
	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	
Gender based division of labor	28	93.33	2	6.67	90	100	0	0	118	98.33	2	1.67	1
Stress	20	66.67	10	33.33	85	94.44	5	5.56	105	87.5	15	12.5	5
Lack of access & control over resources	30	100	0	0	86	95.55	4	4.45	116	96.67	4	3.33	2
Women high dependency on	25	83.33	5	16.67	87	96.67	3	3.33	112	93.33	08	6.67	3

their husbands													
Drought induced migration & conflicts	27	90	3	10	82	91.10	8	8.90	109	90.83	11	9.17	4

Source: Survey Result, 2015

**Gender based division of labor increased women workload:** Table 5.4 clearly shows the top five factors that exposes women and children to high vulnerability to climate changes. Almost all (98.33%) of respondents believe that gender based division of labor is the most critical factor that makes women more susceptible to climate changes, like drought. This means that although climate change generally affects pastoral communities, the impact on women has become more pronounced due to the fact that pastoral women shoulder multiple household responsibilities that makes them more vulnerable to and affected by the impacts of climate change related problems.

Moreover, so as to meticulously figure out how gender based division of labor made women more vulnerable, FGD and key informant interviews were conducted. The result indicates that there is increased work burden on women during drought time. Pastoral women in Borana carry out several household responsibilities including but not limited to taking care of children, managing young calves, looking after sick and weak livestock, milking livestock, fetching water and collecting firewood and household food preparation. For example, during drought all water resources get depleted and women are supposed to travel long distances to access water for household consumption (drinking, cooking, childcare, washing, etc.). Moreover, when women must spend more time on these routine tasks, it limits their time that could be spent on income generation, alternative livelihood activities, training, and education, participating in institutional and governing fora, engaging in social and developmental opportunities and maintaining their health. The more time they spend on some tasks (say fetching water and collecting firewood), the less time will remain to accomplish other tasks (say, food preparation).

Results from the women key informants had indicated that lack of water rendered women and children more vulnerable to water-borne diseases. This is because children were mostly in the homesteads handling foods in poor sanitation. Children are exposed to contaminated water which could have been avoided, if the mothers had enough of clean and quality water. Diseases mostly affected women and children increasing the burden of women psychologically, emotionally and

physically, because women were care-givers in the Borana community and in times of sickness, women had extra workloads that made them vulnerable.

Associated with this, in times of food shortage in the households, women first feed all members of the household before themselves, i.e., if there is any left over. This predisposes women to malnutrition and related health problems with subsequent impacts on children and the entire household. On the other hand, when women fail to meet household responsibilities, they get into disputes with husbands that strain intra-household relations. In extreme situations, such disputes often lead to divorce and eventually to destitution of pastoral women. The result is consistent with other study. Akililu and Alebachew (2009) found that in the southern lowlands, in many ways, existing inequalities created by social norms and inequitable power relations in the community were being entrenched by the impacts of climate change.

According to results indicated in table 5.4, the second causes of women and children vulnerability to climate change was lack of access and control over resources. The survey result discovered that 96.67 % of respondents asserted that women have lack of access and control over resources that contributes to their vulnerability. This is in line with the study by Rossi and Lambrou (2008) which revealed that access to livelihood resources is controlled by men in African communities.

In order to deeply understand how gender disparities in accessing and controlling resources can heighten vulnerability of women and children, the FGDs were conducted with key personalities in the community. The finding illustrated asymmetrical power relations between women and men and their unequal access, control and ownership of resources such as land, property, livestock and development resources including credit, agricultural inputs, technologies, trainings and information. For instance, land is the most important asset that households depend upon for agriculture and sustaining their livelihoods. It is a material and productive resource, which is critical for farming, pastoralism and food production. However, land also has powerful social, cultural, economic, political, symbolic, spiritual and status-defining meanings. Yet, women's ownership, security and control over land as a critical resource represent one of the widest disparities in gender relations and equality.

Moreover, like in most pastoral areas, in Borana, women also have differential control and ownership of livestock within agriculture, rangeland and household management. Livestock are important to wealth saving and security in times of crises, for dowry and brides' wealth, and act as powerful symbols of wealth and property. Women's ownership of livestock is shaped and constrained by economic opportunities, opportunity costs of women's labor as well as cultural norms, gender biases and power relations. Women also have differential access to income generating opportunities, wage labor, markets, income and socio-cultural and political-economic institutions. Often, women do not control the proceeds of their own labor from income generating activities or wage labor. This is especially true where income earned is paid to the "household head", which is often the husband. When it comes to earning, Borana women earn income from livestock products (mainly milk and butter), however during drought season, this income sources will get depleted. Again, this reduced income stream increases women vulnerability as they face lack of means (finance) to purchase some stuff (food, tea, coffee, etc) important for sustaining their livelihood.

The key informant interview result also confirmed that, among the Borana people, most decision-making responsibilities of the household and family at large rest squarely on the shoulders of the household head, i.e., husband in most cases. Matters pertaining to property ownership and distribution are thus handled and managed by men. The head has all the powers to direct the rest of the family and equally make decisions affecting all its members. Women are not allowed to head households; they only do so on special circumstances for instance if they are widowed or divorced. They, therefore, have less power over family finances and other assets; they can only use these resources with blessings and express permission from their husbands who are the owners and have complete control. Without the power to decide on family resources and finances, women's ability to manage risks and external shocks for example diversifying livelihoods is limited. They are not allowed to make decisions which affect their lives directly and even to participate in most fora, hence, this enhances their vulnerability. This implies that shouldering multiple family responsibilities without having power to make decision on resources make women more vulnerable to climate changes.

### **5.3.2 High dependency of women on their husbands:**

Table 5.4 also indicated that almost all (96.67%) of women respondents believe that their dependence on their husband is among the critical factors causing their vulnerability to climate change. Results from the women's focus group had also indicated that climate change is a reality in the community and both men and women were having challenges in sustaining their livelihoods; women indicated that their husbands had lost many livestock to the drought and this sent them deep into poverty because they only relied on their husbands for livelihood provision since they did not own livestock. With poverty staring on their faces women were faced with a lot of challenges in household food provision, basic health care needs for themselves and the other family members. The fact that they did not have the power to decide and plan ahead about their lives made it difficult to cope with the challenges of climate change rendering them vulnerable. Women in the focus groups had further indicated that they stayed at home to take care of children and the elderly and sick members of their families while their men migrated to access water and pasture for their livestock. Not only economic dependency but also the women are also psychologically dependent on their husband in finding alternative livelihood solutions.

**5.3.3 Drought induced Migration and Conflicts:** It is also indicated that 90.83% of respondents believe that drought induced migration and conflicts is the 4<sup>th</sup> largest factor that heightens women and children vulnerability to climate change. The focus group discussion had indicated that climate change (especially drought) causes migration of pastoralists in search for pasture and water. However, male migration often increased the women's workload, as they were left behind to manage the households by themselves in addition to their routine tasks. Migration also results in conflicts which led to a lot of loss of human life leaving women and children vulnerable without husbands to protect them from external attacks, and become the sole breadwinners for them and their children.

At times of conflict and violence, pastoral women also suffer from other negative consequences. For instance, in the absence of men, they have the sole responsibility of sustaining the household which increases their workload. Many women and young girls fear going out of their villages, as they are often the targets of attacks, and this makes it difficult for them to fetch water, collect firewood or go to the market. Additionally, when part of the family is moving, usually women



and children remain behind. Moreover, the study also revealed that conflicts often lead to population displacement and livestock raiding. The prevalence of social and economic instability, force children to drop out of school, leaves farms and settlements unattended, and crops not harvested.

“**Stress**” is a fifth factor causing women and children vulnerable to climate changes (Table 5.1). In order to obtain deep insight into how stress escalates vulnerability of this segment of the society, discussions were undertaken in the FGDs. Surprisingly, participants revealed that the cumulative effects of all the above mentioned factors (increased workload, lack of control and power over resources, economic and psychological dependency on husbands, migration and conflicts) are stressors that further exacerbate net vulnerability of women and children to climate changes. Other study by Bartlett (2008) in Kenya also identified that stress is likely to be heightened in Women after disasters like drought and flood. Overcrowding, lack of privacy and the collapse of regular routines and livelihood patterns can contribute to stress leading to anger, frustration and violence, with children (especially girls) and women who are the most vulnerable bearing the brunt.

#### **5.4 Borana Women’s Adaptation Strategies to Climate Change**

It is widely recognized that climate change does not affect people equally. The related disasters and impacts often intensify existing inequalities, vulnerabilities, economic poverty and unequal power relations. Differently positioned women and men perceive and experience climate change in diverse ways because of their distinct socially constructed gender roles, responsibilities, status and identities, which result in varied coping strategies and responses (Lambrou and Nelson, 2010). Adapting to climate change will require a broad range of efforts, incentives, resources, commitment and active interventions throughout most parts of society. Therefore, the current study has tried to identify strategies that communities (including women) employed to adapt to climate changes and institutional responses meant to strengthen adaptive capacity of the community.

***Figure5: A Case study from Dharito kebele, 2015***

*According to a focus group discussion in Dharito kebele of Yabello woreda ... every season is now a drought...*

*The negative effect of drought on people and their livelihoods are still felt by the communities. We didn't get enough time to fully recover. The seasons are now mixed. You saw rain when you shouldn't. There is erratic and untimely rain and/or too much rain in few days in few areas only. These days it is like every day and seasons are one. Very few rain which doesn't help regeneration of pasture and availability of water. Then again you find yourself in drought time. The drought nights are longer. It is like one week of dry period, days/nights are same in three month period. This is due to multiple stresses, such as shortage of animal feed, water and food. Able family members are moving with livestock long distance in search of pasture and water, women and girls are busy on daily basis fetching water, feeding calves and weak animals, provide care to families, etc. You don't find any one at home the whole day. Children were left behind with their grandmothers/ care givers with less milk available at home. Everyone is busy and struggling for survival of their families and animals.*

## **5.5 Community Adaptation Strategies to Climate Change**

The study result shows that Borana community's adaptive strategies can be broadly classified as livestock and range system oriented, alternative livelihood options, social support system and consumption smoothing. Survey result revealed the extent to which various strategies are practiced in the area and analysis had been made to see how climate change affects local adaptive capacities. In this section specific adaptation option under broad categories were presented.

### 5.5.1 Livestock and rangeland management oriented adaptation strategies

Table 5. Livestock & rangeland management oriented adaptation strategies

Livestock & rangeland management Oriented strategies	Yes		No		Total		Rank
	Count	%	Count	%	Count	%	
Herd diversification	110	91.67	10	8.33	120	100	1
Splitting of Herds & Families	90	75	30	25	120	100	3
Making Communal Enclosure (Kalo)	100	83.33	20	17.67	120	100	2
Hay Making	50	41.67	70	58.33	120	100	5
Seasonal mobility	80	66.67	40	33.33	120	100	4

Source: Survey Result, 2015

#### 5.5.1.1 Herd Diversification

Adaptation and risk avoidance are possible through maintaining mixed herds containing different animal species which can withstand different climatic and ecological conditions (Toulmin, 1994). In line with this, current study revealed that the majority (91.67%) of respondents asserted that they practice herd diversification as local adaptation strategies. Traditionally, Borana are cattle keepers. They value cattle more than other types of livestock, both culturally and economically. Due to climatic change and variability and keeping of other livestock species by neighboring communities like Gabra and Garri, most of the Borana pastoralists have started diversifying their livestock herd (Table 5).

Diversification offers sustained supply of various livestock products, allows the manipulation of different ecological potentials of livestock, and helps to spread risks associated with changing climatic conditions. In general, there appears to be a shift from the production of grazers (cattle and sheep) to browsers (camels and goats) as browsers are more adaptive to changing climatic conditions and vegetation cover by introducing camel to the area. Almost, all respondent households have rearing cattle, goat, sheep, camel and chicken all together. Managing different species of animals can help pastoralists to take the advantages of mixed nature of ecosystem. Therefore, rearing all these types of livestock by a single household is one of the strongest indications of adaptation strategy for climate change and variability.

The FGDs also indicated that rearing small ruminants (goat) and camels reduces women vulnerability because their income sources won't get dry even during drought season. Selling goats is not strategic decision unlike that of cattle and pastoral family with goats can easily sell it and gets cash for home consumption. Because goats are drought resistant, its market price is relatively good which is also helpful for the family. Similarly, camels serve women and family, through high milk yield/production than cattle. Due to its drought resistance and high milk production potential of camel, herding camel is more beneficial for pastoralist in general and women and children in particular. Moreover, women are responsible for using and selling milk and milk products in Borana. So family holding camels can withstand drought shocks than those with no camels. Obviously, stronger income source of family and high nutritional value of milk reduces children's vulnerability to climate change.

#### **5.5.1.2 Making Communal Enclosure (Kalo)**

The survey result confirmed that 83.33% of respondents (Table 5.5) use communal enclosure to cope with climate change. Communal enclosures are established at village or cluster levels and reserved for vulnerable animals which can't trek long distances to search pasture. The study by Abarufa (2011) identified that communal enclosure avoids the fragmentation of the rangelands and protects grazing for weak livestock during most critical times of the year (Table 5).

As stated in earlier section, feeding weak animals and calves is the responsibility of women. This implies that if enough pasture is available in communal enclosure, women workload and vulnerability during drought will reduce. Therefore, one can deduce that the presence of communal enclosure is a vital climate change adaptation mechanism for pastoralists and women. However, during FGDs, participants argued that factors such as land degradation, over grazing and large number of livestock population coupled with rain shortage are challenges to rely on communal enclosures as adaptive strategy.

#### **5.5.1.3 Splitting of Herds and Families**

The study also identified that 75% of sample respondents uses splitting of herds and families so as to minimize negative effects of climatic shocks. During dry period when the access and availability of pasture and water was serious problem, Borana pastoralists split their herds and families into different locations. This depends on the types and condition of animals and labor availability and requirement for those particular animals in particular location. Ali (2008) as

cited in Abarufa (2011), also found that splitting of herds and families are risk reduction mechanisms that have been practiced by pastoralists. Animals may be kept in different areas which reduce the effects of localized droughts and disease outbreak (Table 5).

#### 5.5.1.4 Hay Making

The study also discovered that 41.67% of respondents practice hay making as local coping mechanism to protect their livestock from drought hazards. Borana pastoralists have been practicing open grazing system for livestock grazing outside home. For new born calves and weak animals women are making hay when pasture is available and feed them during critical period (Table 5) (Fig. 4).



**Figure 4 : Hay making practice in Did- Hara, Yabello**

In addition to collecting grass in dry season for calf feeding by Borana women (Ali, 2008), hay-making during wet season was encouraged among the Borana to mitigate climatic impacts. By realizing the importance of it, most Borana pastoralists have been practicing hay making to feed their animals during critical time. According to Godana Guyo, one of my key informants, hay making practice reduces the distance travelled by women to cut grass during dry periods.

#### 5.5.1.5 Mobility and Rangeland System

Referring to table 5.5 above, 66.67% of respondents use mobility and rangeland system. The study found that various types of local resource management strategies are used by pastoral communities to deal with changing climatic conditions. Dynamic management of rangelands, especially, water and livestock resources is widely practiced in order to prevent overgrazing, allow fast regeneration of pasture, and in response to climatic variations within and between

months in a year. Rangelands are traditionally managed by dividing into dry and wet season grazing considering water availability and herd size and structure. Particular areas, which are close to settlements and homesteads and considered rich in both pasture and water resources, are reserved for calves, milking cows, and weak livestock.

It is already mentioned that the Borana pastoralists move from one place to another in search of water and pasture during dry periods. This mobility enables them to exploit and utilize widely dispersed pastures at times when they are nutritious. The movements also facilitate an escape from drought and diseases both locally and across national boundaries. Herd separation and splitting into either home-based ('warraa') or satellite camps ('fora') are crucial for mobility and resource management. This ensures minimal use of the water and pastures reserved for dry-period grazing. The Borana also parcel out livestock among relatives ('dabarre') living in different geographical locations to increase the chances of survival during droughts or outbreak of disease. Communal land ownership and management of natural resources are central to pastoralism because they ensure that herd owners can move freely in search of water and pasture in different locations at different times of the year.

However, focus group discussion session revealed that this practice of traditional mobility and rangeland system is getting challenged due to increased private enclosures and crop farming that reduced communal rangeland for free mobility of herds. Though this mobility had been widely used by pastoralists and helpful coping strategy for pastoral family in general, it increases women and children vulnerability to climate change due to aforementioned reasons.

## **5.6 Alternative livelihood options as adaptive strategies to climate change**

Livelihood diversification outside pastoralism is also employed as coping strategy to climate change and variability (Elias, 2009). Ayalew (2011) further stressed that pastoralists have been involved in a variety of economic activities and derive their sustenance from other alternative sources of income to diversify their income sources. Engaging in alternative sources of income by pastoralists may reduce the degree of climatic impact on their livelihoods.

The current study also identified that different alternative livelihood options such as milk & butter selling, savings in local financial institutions, crop cultivation, petty trade, casual labor work and charcoal and firewood selling (Table 5.6).

Table 6. Alternative Livelihood Options (multiple responses)

Alternative livelihood options	Yes		No		Rank
	Count	%	Count	%	
Crop cultivation	50	41.67	90	58.33	3
Charcoal & fuel-firewood selling	20	16.67	100	83.33	6
Milk & butter selling	86	71.67	34	28.33	1
Savings and Loan	70	58.33	50	41.67	2
Petty trade	43	35.83	77	64.17	4
Causal labor	31	25.83	89	74.17	5

Source: Survey result, 2016

### 5.6.1 Milk and butter sales

The majority (71.67%) of respondents asserted that community engages in milk and butter selling as coping mechanism against climatic shocks. One of key informants, Hon. Dr. Borbor Bule, stated that *“Selling milk in the past was uncommon and a lowly business to an extent that any person or family involved in selling milk was dubbed as ‘falfala’ literally mean someone who hope for poverty. Surplus milk was always kept for and freely given to guest, neighbors, wayfarers and even to cattle during major rainy seasons. In a pastoral campsite, consisting of a number of families, it was the responsibilities of women to collect and store milk in container locally called Gorfa. The milk is mainly used for family consumption and guests”*.

Nowadays, selling milk is a well-organized business with well-established network of collection. The commercialization of milk in pastoral areas and its increasing demand in the urban areas causes to drain milk from far and wide, *with its resulting negative impact on nutrition, particularly for children and the elderly*. However, milk sale is an important contributor to pastoral household income and if supply is fairly balanced, its pros as coping mechanism outweighs the cons. More attention among pastoralists is now on higher milk yielding, drought resistant animals like camel.

### 5.6.2 Savings and Loan

Fairly large (58.33%) of respondents stated that they engage in savings and investments as protection against climate change. In the focus group discussion, they had stated that Borana

community, especially, women have begun using local financial institutions, such as, RuSACCOs and VSLAs (village saving and loan associations). Their saving habit is increasing from time to time. They take loan from their savings in the local groups and use for productive and emergency purposes. Moreover, it is observed that very few rich pastoralists are now building a house in towns like Yabello and other peri-urban center. Others are investing in hotels and guest houses, feedlot farm businesses, construction sector, and dry freight and public transport service to the area which was unfamiliar to many pastoralists in previous year. This approach was mainly promoted by government, other development actors and peer business influences, and a few wealthy pastoralists and people transitioned out of pastoralism seem to have started adopting the strategies.

Therefore, saving and loan as well as investment practice is very effective adaption strategy that must be followed to remain resilient in the wake of climatic shocks.

### **5.6.3 Crop farming**

The survey result had indicated that 41.67% of sample respondents had been engaged in crop production as adaptation strategy. Crop cultivation is used as a complementary strategy to avoid potential risks of sole dependence on livestock production. It is a reality observed from ground that crop cultivation is spreading to rangelands and areas that have never been put under cultivation, particularly in Borena. The study by Oba (1998a), also indicated that farming was an economic diversification due to difficulty of climate change and variability for the Borana to rely on livestock for food alone. The expansion of crop cultivation is mainly linked to decline in range resources as well as a decrease in both per household livestock numbers and productivity. Though crop farming is emerging adaptation strategy, given the unreliability of rainfall, increased frequency of droughts and associated crop diseases and pests, the sustainability of rain fed crop cultivation as a viable coping strategy is questionable. Though crop farming is being widely used as an ad hoc coping strategy by pastoral communities, increased dependence on it might increase vulnerability of the local community to future climate change related risks. Moreover, crop cultivation on fragile rangelands would accelerate soil erosion and land degradation.



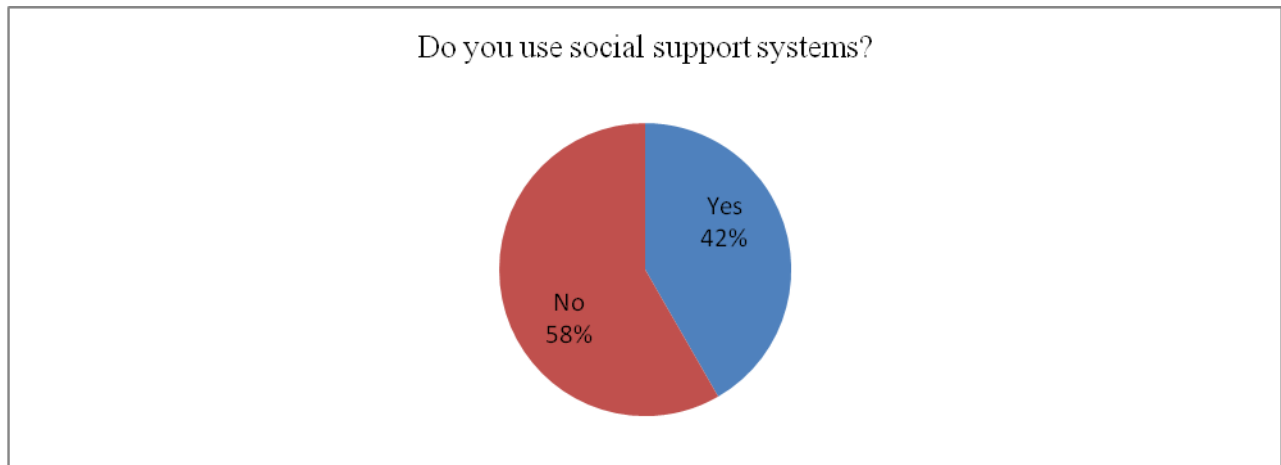
#### **5.6.4 Other income generating activities**

According to survey results, 35.83%, 25.83% and 16.67% of respondents asserted that they are engaged in petty trade, casual labor work and charcoal & firewood selling, respectively.

This shows that there is emerging trends that pastoral communities are looking for additional sources of income which include engagement in non-pastoral activities. Most of these income generating activities are carried out by women. From these income generating activities engaging in petty trade and casual labor work are effective adaptation mechanism as they are sustainable and generate enough income during drought seasons. However, study by Aklilu and Desalegn (2013) revealed that charcoal burning and fuel-wood selling are not only unsustainable but can also contribute to further degradation of resources and desertification which accelerates both vulnerability and retards local and national development endeavors.

#### **5.6.5 Social Support Mechanisms: Resource Sharing**

The survey result as shown in underneath pie chart, 42% of respondents use resource sharing/ social support system as a means to cope with climate change (Fig. 5). Resource sharing is a traditional social support mechanism practiced by pastoral communities to support vulnerable members of the society. According to focus group discussions, the support mechanism ranges from simple sharing of milk and other food items to contributing heads of livestock in order to restock the herds of affected families. In some cases, households who received the support in turn contribute to the community by helping others through labour work and livestock herding. Local communities support relatives and other clan members by temporarily providing milking livestock and other productive assets to overcome immediate household food shortages.



*Figure 5: Respondents social support system*

Source: Survey result, 2015

According to key informant interview, Borana pastoralist was known by practicing different self-helping mechanism, locally called *busaa*, *gonofa*, *hameessa*, *dabaree*, etc. The following exhibit elucidates concepts of these local social supporting systems.

***Exhibit 1: Borana Social support systems***

***Busaa-*** Villagers help needy households with milk that is arranged by head of village (*Abba Olla*). Unless it is beyond their control, it is difficult for fellow-villagers to refuse to help poor household. The importance of mutual help is expressed by the following saying:

“*Namiollaafiduddaanoleja*”, which literally means a person, stands up straight with the help of his/her villagers and his/her backbone. This stresses how villagers need to help each other.

***Gonofa:*** The close clan members (called *gosa*) provide livestock for family who lost its livestock due to natural or man-made calamities such as drought, war and disease.

***Hameessa-*** lending of temporary milking animal by relative or friend for specified period of time. The lending period of *hameessa* is relatively very short if we compare with *dabaree*. There are cases where *hameessa* becomes *dabaree* based on the consent of lender and condition of receiver.

***Dabaree-*** Transferring of milking animals for long period of time by better-off households. The receiver can use the products of the animal but have no right to sell or transfer without prior consultation of the owner. The duration of *dabaree* can pass from father to child or even more, based on the agreement of the lender. The condition of receiver in managing or taking care of

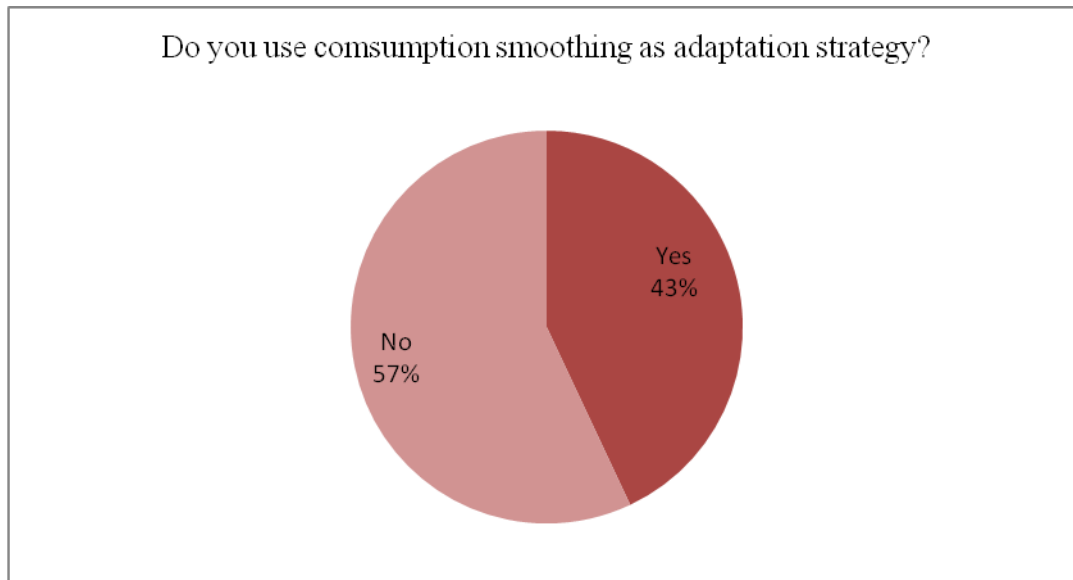
*those animals is other decisive factor that can contribute for the duration of dabaree. After the expansion of farmlands, lending plough animals (oxen) can be seen as dabaree.*

According to Abarufa (2011), in Borana pastoralist area, the drought becomes recurrent in nature and affects the livelihood assets, particularly natural assets of the community which are sensitive to climatic impacts. Different customary institutions which are effective to manage water and pasture resources lost their potency and are kicked-out of the system by immature youngsters. Due to degradation in potency of local leaders and other external factors like bush encroachment, regionalization policy of Ethiopian government, inappropriate development interventions, etc., different indigenous adaptation mechanisms used by Borana pastoralist to mitigate climatic impacts have been weakened over time.

The FGD and key informant interview result conducted for this study purpose also confirmed that although the social support system are critical indigenous adaptation system against climate change, the capacity of these social support systems has been weakened because directly or indirectly they are dependent on climate change and variability. Hence, those practices' status in supporting pastoral households including women is currently doubtful.

### **5.6.6 Consumption Smoothing**

As indicated in the following pie chart, 43% of respondents asserted that they use consumption smoothing as adaptation strategy to climate change. This means that during severe disasters, some pastoral households are forced to change their normal food intake and adjust their consumption to the available household resources (Fig.6).



*Figure 6. Respondents Adaptation strategies*

Source: Survey Result, 2016

Moreover, the FGDs participants explained that consumption smoothing usually involves adjusting diets to available food items, supplementing with edible wild plants and fruits, and reducing the amount of meals and the frequency of serving. Such adjustments involve food intake from three times to once a day, giving priority to children and the elderly, and shifting from milk and milk products to cereals and tea. Sometimes, households mix cattle blood with milk and water, milk with water and maize flour and there is unprecedented consumption of tea replacing milk during severe droughts. This shows that regulating consumption pattern has less contribution for minimizing vulnerability of women and children.

### **5.7 Institutional responses to reduce women and children vulnerability to climate changes**

As stated by Aklilu and Alebachew (2009), the Government of Ethiopia (GoE) has adopted policies, strategies and action programs aimed at poverty reduction, environmental protection and sustainable development. However, there have been institutional responses in various ways by state and non-state actors against the adverse impacts of climate change over the past few decades in the country. This study attempted to identify institutional responses employed by government and NGOs that are meant for reducing vulnerability of community (including women and children) to climate change. Similarly, challenges associated with these responses/interventions are duly discussed. The study used key informant interviews with government officials and FGD with community members. In Borana zone, institutional

responses mainly focus on emergency assistance, disaster risk reduction, asset protection and livelihood enhancement and conflict management and resolution.

#### **5.7.1 Emergency Responses:**

The GoE has long been engaged in supplying emergency aid to victims of various types of disasters. The contacted government officials asserted that *“In Borana, there has been continued supply of food and non-food items by the government since the 1980s and particularly during recent drought and flooding. Relief operations were carried out and tents, blankets, foodstuffs, mosquito nets and non-food items were distributed and health, sanitation and security services were provided”*.

Relief operations are followed by continued relief assistance and rehabilitation activities for some time in order to restore life and livelihood of the affected people. The Disaster Prevention and Preparedness Office at the district and sub district levels work together with other sector offices and NGOs at the initial stage of a disaster to study and report the situation to relevant authorities for immediate attention and support. During the FGDs, participants reported that the government supports those critically food insecure and destitute pastoral households through its productive safety-net program. For instance, pastoral households in Yabello receive support through food-for-work and productive safety net arrangements. Livestock feed and water rationing has also been carried out in Borena zone during severe droughts. However, emergency responses in most cases do not match the amount required to address emergency needs of the local community, nor delivered on time to local communities.

#### **5.7.2 Disaster risk reduction:**

In the study areas, there are disaster prevention and preparedness units and committees in each Woreda that are commissioned to provide early warning information, assess needs and monitor risks. *However, most of these units suffer from poor organization, limited capacity and resources (material and human), and lack of networking with relevant sector offices.* FGD participants indicated that they are not satisfied with responses of the government particularly against droughts, diseases and pests, and conflicts that have been inflicting heavy losses. In fact, other sector offices undertake some development activities that enhance access to water (through wells and boreholes) and carry out environmental protection and rehabilitation programs to improve range resources. Nevertheless, most of these activities are handicapped by material and capacity

limitations and often lack continuity in order to enable households to cope with the future disasters.

### **5.7.3 Asset protection and livelihood enhancement:**

According to key informants, based on the belief that protection of household and community assets reduces vulnerability to the impacts of climate variability and change, the Federal government introduced a Productive Safety Net Program in 2004. The program is aimed at supporting extremely vulnerable and destitute households through direct transfer of cash and food. It also mobilizes the community through food-for-work arrangements to engage in soil and water conservation, bush clearing and maintenance of rural roads. Additionally, the government has been supporting households by providing different packages that facilitate the transition from an exclusively pastoral way of life to agro-pastoralism through the provision of seeds, fertilizers, tools and training. However, such efforts need to consider appropriateness of the local agro-ecology, and the socio-cultural fabric in transitioning to crop cultivation and sedentary way of life. Moreover, participants of FGD did not consider government responses against climate change induced hazards very effective.

*One of the key informants, Dida Elema, stated “that we have reported the problem at onset of the drought very early and the DAs and other government structure were also collecting information from us timely but they didn’t respond to situation until people starts to migrate to other areas and our animals died in large number”. A discussion with woreda pastoral development office also reveals and triangles the same conclusions that due to lengthy process of flow of communications, various levels of assessment and approval process delays the responses to climate induced problems and sometimes aggravates the impacts on people and vulnerable portion of the society.*

Historically, NGOs plays important role in providing essential humanitarian assistance and lifesaving programs to the people during difficult drought times in the study areas. Even though, local people have been devising several strategies over a years against impact of the climate change, it appears that strategies have reached their limits or no longer stand by itself to deal with the problem and therefore, NGOs operating in the area are supporting vulnerable people focusing on different thematic area to enhance and compliment people’s existing coping and adaption capacity mainly through investment on prevention and preparedness activities. The

projects have had considerable impacts, but also numerous problems in enhancing local adaptive capacity and securing livelihoods. The responses focus on disaster risk reduction (DDR), provision of social services, awareness creation, and conflict management and resolution. DDR through asset protection and livelihood diversification is a basic intervention aimed at reducing vulnerability and enhancing the adaptive capacity of pastoral communities. Specific interventions include water harvesting, identifying and fencing dry season grazing areas, destocking, use of early warning information, micro-credit services (for acquiring goats and camels), and emergency aid.

GPDIs DRR Project is an exemplary intervention designed to enhance the capacity of poor pastoral women by providing female goats so that they can be able to recover their stock. The impact of this project in reducing the vulnerability of women has been considerable, though its continuity to widen the coverage of beneficiaries appears to be limited. Basic social services such as education, health, and infrastructure are for the most part lacking and poorly developed. Some NGOs are involved in the provision of education and health services to the community. According to a key informant interview the number of NGOs and scale of their work both development and emergency operations in the Borana zone has dramatically increased with diverse approaches. However, the provision of these services is largely fragmented, less coordinated and short lived. Social services that particularly focus on women empowerment and reducing their work burdens are quite limited.

In general, most of the interventions of both government and NGOs lack suitability due to disconnected relief and development continuum in order to enable households to cope and recovery quickly from the disaster.

#### 5.7.4 Productive Safety Net Programmes /PSNP

The government is aware that permanent food aid makes recipients more vulnerable, and that emergency relief has to be integrated with development programs. Therefore, a new approach is needed in a situation such as a drought, which has a slow onset.

The Government of Ethiopia has established and adopts PSNP programmes in 2005 in an effort to change a focus from emergency relief to long-term development to increased families' long-term resilience to food shortages. The Productive Safety Net Programmes is aimed at enabling the rural poor facing chronic food insecurity to resist shocks, create assets and become food self-sufficient. PSNP provides multi annual predictable transfers, as food, cash or a combination of both, to help chronically food insecure people survive food deficit periods and avoid depleting their productive assets while attempting to meet their basic food requirements.

PSNP's four major goals are to:

- Support the rural transformation process;
- Prevent long term consequences of short-term food inaccessibility;
- Encourage households to engage in production and investment; and
- Promote market development by increasing household purchasing

PSNP targets chronically food insecure households including women and HHs with large family size which means more children's. The combination of cash and food transfers is based on season and need, with food given primarily in the lean seasons. Thus, vulnerable households particularly women and children receive six months of assistance annually to protect them from acute food insecurity during periods when food insecure people are affected by unpredicted shocks.



## Chapter Six

### 6. Summary and Conclusions

In Borana pastoral area, climate change especially drought had been a major challenge for livelihood of the community. Although climate change has become one of the pressing challenges for community in general, its impacts are disproportionately distributed among geographical areas and socio-economic groups. Borana Pastoral communities are among the most vulnerable groups to climate change impacts and the impacts on women in these communities are more pronounced. This study revealed that factors such as gender based division of labor increased women workload, asymmetrical power relationship between men and women over control of resources, high economic and psychological dependency on husband, drought induced migration & conflict causes increased vulnerability of women to climate changes. The cumulative effect of these factors has put high stress and pressure on women that exacerbated their vulnerability to climate change. For example, climate change has compounded an already existing burden on pastoral women through increased distance of fetching water, fire wood collection, fodder for livestock and other related productive and reproductive roles. Lack of control and decision making power over household resource has subjected women to economic poverty and greater reliance on house band that limit their adaptive capacity. Moreover, the study found that women vulnerability cause problems such as food shortage and malnutrition among children, lack of health and sanitation, lack of self-confidence, etc.

Borana pastoral communities employ different adaptation strategies to cope with the impacts of climate change related problems. One of the strategies is livestock and range management system which include herd diversification, mobility, hay making, communal enclosure and splitting of herds and families. Alternative livelihood options such as crop farming, petty trade, casual labor work, saving and loan, milk selling are among emerging adaption strategies. It is also found that charcoal and firewood selling is practiced by some community members, though not environmentally friendly. Moreover, the study revealed that Borana community had numerous social support systems to help each other. However, these indigenous adaptation

strategies are weakening because of the climate change related problems. Hence, as adaptation strategies are getting weak vulnerability of women and children to climate change is increasing from time to time.

The study also revealed the current institutional responses that attempt to address the multifaceted problems pastoral communities face due to the impacts of climate change. Different organizations stepped up their interventions in order to provide relief and opportunities during the crisis. Majority of the interventions revolve around: (1) increasing the relief efforts by direct provision of food and livestock feed and fodder to affected and most needy households; (2) increasing water availability by water trucking to affected areas; (3) stimulating increased off take of livestock from the affected areas; (4) supporting local veterinarian services in increasing their capacity to monitor animal health and prevent potential disease outbreaks; (5) increasing the demand for and accessibility of animal health prevention products through veterinarian voucher schemes; (6) reinvigorating initiatives and plans to rehabilitate water infrastructure.

Nonetheless, the responses barely consider the gender dimensions of climate change impacts in the area. The institutional responses by GOs and NGOs lack coordination, unsustainable, untimely and have smaller outreach.

## 6.1 Recommendations

Based on thorough analysis of findings of the study, the researcher forwarded the following recommendations that may enhance adaptive capacity of local community to climate change and reduce vulnerability of the community in general and women in particular.

There is inherent need to design adaptation programmes in food security, agriculture, rangelands and managing natural resources in ways that are sensitive and responsive to the different and multiple roles women and men play in various spheres of natural resource management, as well as their households, communities, livelihoods, and customary and statutory institutions and relations (local, national, regional and international). The programmes should have a strong focus on women and gender equity to ensure successful implementation and that adequate resources are allocated to translate this vision into tangible action.

The favorable environment should be created for enhancing communities' indigenous adaptive strategies such as enclosure, hay making, mobility and range system and social support system. Gada leaders and concerned government office must try all their best to maintain and restore cultural resource sharing system. Emerging alternative livelihood options such as crop farming, petty trade and other effective income generating activities must be encouraged and adapted among the community.

Concerted joint efforts of multi-sectoral stakeholders institutions would be advisable to establish in order to plan, implement, monitor and evaluate the development programs meant to pastoral areas to address the social, economic and environmental concerns of pastoral communities in an integrated manner. Adaptation programmes should have long-term goals of increasing gender and social security needs, safety nets and active participation of women in governance at every level through participatory policies and targets, and capacity strengthening, development of leadership and technical skills, and clear recognition and support of their rights, agency and knowledge.

Gender differentiated strategies are required due to differences in gender specific roles and responsibilities created by society. It is better to improve women's livelihoods and strengthen adaptation by ensuring women's access, control and ownership of resources (such as land, livestock, property and income opportunities), and access to development resources such as

credit, information, training and outreach, and culturally appropriate and labor-saving technology. Development agencies must invest in gender sensitive and culturally appropriate labor saving green technologies, water harvesting, storage, irrigation systems, and substitutes for fuel wood and use (including mechanisms for maintenance). This must be designed and implemented in collaboration with women to reflect their needs and concerns. Ensure that physical, cultural, social, economic and practical elements are compatible with their livelihood practices within diverse ecosystems supporting agriculture, pastures, forests, watersheds, households and communities.

Soft skills which build adaptive capacity are critical for continued adaptation over time – that is; analysis of risks, differential vulnerabilities and capacities; decision making; access to climate information services; innovation, as well as good development practice enabling greater access and control over assets and strengthening institutions and rights.

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## Annex I

### Major droughts and their impacts, as recalled by Borana residents

Name of <i>abbagadain</i> power	Period	Reason for the drought	Extent of drought severity	Drought impacts	Aggravating factors
GobaBulee	1969–1976	Light shower of <i>hagayya</i> * rain and total failure of <i>gannarains</i>	Very severe	Insufficient water and pasture; low milk production; significant death of children, elders, and livestock; <i>buusagonofaac</i> ommon as it affected the entire Borana land	Absence of intervention from aid organizations and the government; no backup areas owing to extensive coverage throughout Borana land
Jilo Aga	1977–1984	Erratic and poor <i>gannafollo</i> wed by total absence of <i>hagayya</i>	Very severe	Insufficient water and pasture; low milk production; high loss of livestock both by drought and conflict; high death of adults due to war and famine, death of children; many migrated to Kenya as refugees; restricted movement because of war with Somalia	War with Somali restricted movement and disrupted markets; cattle raids were rampant; labor shortage because of men at war; absence of timely response to crises by donor agencies
BoruGuyyo	1985–1992	Poor <i>ganna</i> and failure of <i>hagayya</i>	Very severe	High cattle death; human death (children and the elderly); high grain price; migration	Instability follows fall of <i>Derg</i> regime; conflict among Gabra, Gerre, and Borana restricted movement and disrupted markets; poor supply of

				to Kenya	grain to area; livestock disease epidemic (blackflies)
BoruMedha	1993–2000	Erratic <i>ganna</i> and <i>hagayya</i>	Moderate	Minor deaths of livestock	Minor conflict between Borana and Garri people
LibanJeldessa	2001–2008	Erratic <i>gana</i> and <i>hagayya</i>	Moderate	Minor deaths of livestock; intervention (both human food and animal feed supplied)	None
GuyyoGobba	2008–present	Failure of both <i>hagayya</i> and <i>ganna</i>	Very severe	High number of livestock deaths; high malnutrition (mainly among elderly people)	Poor response to emergency situation by NGOs and government; poor early warning system and resistance by pastoralists against timely destocking



## Annex II

### **Questionnaire:**

#### **Household Survey Questionnaire**

Name of kebele \_\_\_\_\_

1. Name of the HH \_\_\_\_\_

2. Position in the household \_\_\_\_\_

3. Sex

A). Male B). Female

4. Age \_\_\_\_\_

A) <35 B) 36-60 C) >60+

5. Educational status

A). unable to read and write B). Can read and write C). Primary schools ( 1-6) attended

D).Secondary schools and Above

6. Occupation

A). Pastoralist B). Agro pastoralist

7. What types of climate change induced hazards are observed in your areas?

A). Drought B). Flood C). Increased Temperature D). Rainfall variability E). Other please specify

8. Climate change induced problems negatively affects women and children differently than other portion of society e.g men.

A). Strongly disagree

B). Disagree

C). Neutral

D). Agree

E). Strongly agree

9. What are factors that increase vulnerability of women and children? If the answer for the question # 8 is A or E.

- A). Gender based division of labor
- B). Lack of access and control over resources
- C). drought induced migration and conflicts
- D). Women high dependency on their husbands

10. What are the coping/adaptive strategies that pastoral women and children employ in your area?

- A). Herd diversification
- B). Splitting of Herds & Families
- C). Making Communal Enclosure (Kalo)
- D). Hay Making
- E). Seasonal mobility

11. What are alternative livelihoods strategies/options that women and children use during extreme weather conditions?

- A). Crop cultivation
- B). Charcoal & fuel-firewood selling
- C). Milk & Savings and Loan
- D). Butter selling
- E). Petty trade
- F). Casual labor

12. Do you use social support system as responses to extreme weather variability? A). Yes

B). No

13. Do you use consumption smoothing as a strategies during bad drought year? A). Yes B). NO

**Focus Group Discussions/ KII checklist**

1. Name ..... Position .....
2. What are trends/ history of drought in your area?
3. What is the agro-ecology of your zone/woreda?
4. Is there any form of climate change in your zone or district? If your answer is yes, please can you explain?
5. If the answer to Q2 is yes, please would you like to explain the extent of climate change and variability impact on children and women? And why?
6. What is the impact of climate change and variability on the livelihood of the people there?
7. What are the local coping mechanisms used to reduce the impacts?
8. What is the institutions effort to reduce future impacts?
9. What are the main challenges and how do you think they can be improved?