INDIRA GANDHI NATIONAL OPEN UNIVERSITY

SCHOOL OF CONTINUING EDUCATION

DEPARTMENT OF RURAL DEVELOPMENT

AN ASSESSMENT OF THE RANGELAND DEGRADATION AND ITS IMPACT ON THE LIVELIHOOD OF RURAL PASTORALISTS: IN THE CASE OF YABELO WOREDA OF BORENA ZONE, OROMIA REGIONAL STATE, ETHIOPIA.

BY

KETEMA URGA SERDA

APRIL 2015

ADDIS ABABA, ETHIOPIA

INDIRA GANDHI NATIONAL OPEN UNIVERSITY

SCHOOL OF CONTINUING EDUCATION

DEPARTMENT OF RURAL DEVELOPMENT

AN ASSESSMENT OF THE RANGELAND DEGRADATION AND ITS IMPACT ON THE LIVELIHOOD OF RURAL PASTORALISTS: IN THE CASE OF YABELO WOREDA OF BORENA ZONE, OROMIA REGIONAL STATE, ETHIOPIA.

A THESIS SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES OF INDIRA GANDHI NATIONAL OPEN UNIVERSITY (IGNOU) IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF ARTS IN RURAL DEVELOPMENT (MARD)

SUBMITTED BY:

KETEMA URGA SERDA

APRIL, 2015

ADDIS ABABA, ETHIOPIA

DECLARATION

I hereby declare that the Dissertation entitled AN ASSESSMENT OF THE RANGELAND DEGRADATION AND ITS IMPACT ON THE LIVELIHOOD OF RURAL PASTORALISTS: IN THE CASE OF YABELO WOREDA OF BORENA ZONE, OROMIA REGIONAL STATE, ETHIOPIA. Submitted by me for the partial fulfillment of the M.A. in Rural Development to India Gandhi National Open University (IGNOU) , New Delhi is may original work and has not been submitted earlier to IGNOU or to any other institution for the fulfillment of the requirement for any course of study. I also declare that no chapter of this manuscript in whole or in part is lifted and incorporated in this report from any earlier work done by me or others.

Place: Addis Ababa, Ethiopia

Signature: _____

Date: April, 2015

Name: Ketema Urga Serda

Enrolment No: **ID1364682**

Address: Tel: +251 911 01 54 62

E-mail: ketema_urga@yahoo.com

CERTIFICATE

This is to certify that **Mr. Ketema Urga Serda** student of **M.A.(RD)** from Indira Gandhi National Open University ,New Delhi was working under my supervision and guidance for his Project Work for the Course MRDP-001. His Project Work entitled AN ASSESSMENT OF THE RANGELAND DEGRADATION AND ITS IMPACT ON THE LIVELIHOOD OF RURAL PASTORALISTS: IN THE CASE OF YABELO WOREDA OF BORENA ZONE, OROMIA REGIONAL STATE, ETHIOPIA**,** which he is submitting, is his genuine and original work.

Place: Addis Ababa, Ethiopia Signature:_____

Date: April, 2015 Name of Advisor: Mulugeta Taye (PhD, Associate Professor)

Address: Tel: +251 911 34 57 28

E-mail: mulutaye45@gmail.com

ACKNOWLEDGMENTS

First and foremost, I would like to extend my heart-felt thanks to the Almighty God for providing me with the opportunity of joining this program and for enabling me to conduct this study.

I convey my deepest thanks to my advisor Mulugeta Taye (PhD, Associate Professor) for giving me constructive pieces of advice and guidance starting from the proposal writing to the completion of the research work. I thank him for his genuine and unfailing encouragement, suggestion, insight, guidance and professional expertise to complete this work.

My thanks also go to the following individuals and organizations for offering me assistance to make the study a success: my wife S/r kidist kebede for her unreserved support and tolerance during my education and thesis work, W/o Buzenash Beza, Ms.Asert Fenta Mr.Kassu Urga, respondent households, focus group discussants, Yabelo Woreda office of rural agriculture and pastoralist development, and Oromia pastoralist area development commission.

TABLE OF CONTENTS

ACRONYMS

BLPDP	Borena Low Land Pastoralist Development Program Documentation
DFID	Department for International Development
FAO	Food and Agriculture Organization
FGD	Focus Group Discussion
KPA's	Kebele Peasant Associations
PCDP	Pastoralist Community Development Programme
PFE	Pastoralist Forum Ethiopia
UNCED	United Nations Conference on Environment and Development
UNEP	United Nations Environmental Programme
UNPP	United Nations Population Projection

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

Ethiopia is one of the most severely affected country in the Eastern Africa particularly in rangeland degradation which resulted in decline in productivity and qualities of pastoral range resources, loss of bio-diversity and suffering of the people and animals in chronic food shortage. The full implication of loss and degradation of rangeland resources as well as main causes must be recognized in order to conserve the range resources of the country. The main objective of this study was to assess the impacts of rangeland degradation on the livelihood of rural pastoralists in the Yabelo districts. The data for this study were collected using survey questionnaire, guided interview, observation, and focused group discussions. Two Kebeles were selected purposively where rangeland degradation is high and the problem of food insecurity is observed. Eighty five households were considered for analysis of data. Household size from each Kebeles was selected based on the Kebeles population proportion. The results of investigation showed that rangelands of study area is highly degraded .The area once three decades years ago were under a good rangeland resources are changed in to new condition. Increase in human and cattle population presser which increases a demand on the range resources use and lacks of alternative sources of resource use and land ownership, incensement in crop cultivation which is a newly emerging system in the area are the major causes for range resources degradation in the area. Moreover bush encroachment, lack of commitment at individual level and organizations in range resources management are some of the prevailing causes of rangeland degradation in the district. An impact of rangeland degradation which influences pastoral livelihood was clearly observed in the study area. Therefore, it is suggested that among other things diversifying the pastoral economy, implementing participatory rangeland management

technique, incorporation of local knowledge privatizing the land, mobilizing the pastoralists on resources management and conservation, creating sense of ownership and reduce the rate of population growth through family planning must receive policy attention to reduce degradation of rangelands and to secure pastoral livelihood.

CHAPTER ONE

1. Background of the Study

1.1. Introduction

Rangeland degradation is the most extensive among the major types of current land use pattern and few countries have less than 50% of their pastoral lands degraded (World Bank, 1992). De Queiroz (1993) suggested that the reference point for rangeland degradation when measured in terms of beef that can sustain is the potential natural community that provides the highest grazing value for beef cattle production. This indicates that one of the major aspects of rangeland degradation is reduction in productivity.

Rangeland degradation is a worldwide problem which constitutes the largest biome (major ecological system). Its impact has recently been serious problem due to the multiple causes such as climate change (increase in temperature, expansion of tropical cattle disease, loss of bio diversity, and drought), increasing in human and animal number or population which creates pressure on range resource management regimes (Ellis,2008).Pastoralism is a livelihood which extensively followed across the world. It supports twenty million peoples, being practiced in 25% of the world and providing 10% of the worlds meat production (FAO, 2001).

However, research studies about pastoralism as livelihood strategy and rangeland resources around the world and at large in Africa depicts that, there is a marked deterioration of rangelands with a shift in vegetation composition, i.e. decrease in the proportion of unpalatable grasses, bushes/shrubs and absence of water in the rangeland which conforms to other reports (Abule, 2005).

African pastoral systems in the several decades have become extremely vulnerable to recurrent livelihood shocks and negative trends that have caused a substantial and long lasting decline in the welfare of pastoral sector. The sustainability of the pastoral mode of production has significantly undermined by exposure to the exogenous pressure of natural and manmade shocks especially recurrent droughts, violent conflicts, in appropriate interventions and governance (W/Georgis, 2008).

Rangeland development in Africa have failed to contribute towards improved bio-diversity conservation and livestock production (Angassa and Oba,2008b).This has been attributed to poor understanding of ecological ecosystems and traditional practices by policy makers (Tefrea et al ;2007).The participation of local communities and use of their ecological knowledge could therefore help policy makers and researchers to better understand the ecosystems and contribute to sustainable management (Reed et al;2008)

In Ethiopia, rangelands perform numerous functions that have significant ecological and livelihood values for many parts of the lowland pastoralists and agro pastoralists. The rangelands of Ethiopia cover more than 60% of total area and are the major sources of livestock feed (BLPDP and PFE, 2004).These areas are characterized by low land plains relatively harsh climate with low moisture, unreliable and erratic rain fall and high temperatures (Ayana, 2007).Of the total livestock population of the country about 40% cattle, 75% goat, 25% sheep, and almost 100% of camels are raised in the rangelands (Alemayehu, 2004). Moreover, in Ethiopia about eight to nine million pastoralists (ACDI/VOCA, 2008) of an estimated national population of 70.7 million (World Bank, 2008), harbor Africa's largest livestock population. Pastoralism is cultural and economic system that determines and is determined by social

structure, resources management, productivity, trade and social welfare mechanisms in communities founded on livestock rearing as primary economic activity (Nori et al;2008).

However, studies shows that, in Ethiopia gaps in the conservation, reserve network leave the regions of rangeland particularly under representation in formerly protected areas. Remaining rangeland in the country is threatened by unsustainable land use, specially overgrazing, bad farming, mining and conservation to crop lands. Pastoralism has been subjected to multiple pressures which have undermined its resilience as way of life. Given the incentives and support, however, it could prove to be an even more productive and valuable aspect of rural livelihoods, not least of all because so many people depend on it for their sustenance.

So, recognizing this for different actors was an attempt made to help pastoralists in the study area through identifying the causes and consequence of rangeland degradation and to introducing different types of rangeland management techniques based on the rangeland resources and strengthening the traditional institutions to reduce rangeland degradation through proper management and finally improved pastoral livelihoods .Therefore , in line with these this study was prepared a base line assessment and documented the current status of rangeland degradation and its impact on the rural pastoral livelihood in selected Kebeles of Yabelo Woreda of Borena Zone with a special focus on the causes that are leading to prevailing situations and its impact on pastoral livelihood.

1.2. Statement of the problem

Rangeland provides a wide variety of goods and services desired by society including livestock forage or grazing, wildlife habitat, water, mineral resources, wood products, wild recreation, open space and natural beauty or quality of environment. The geographic extent and many

important resources of rangelands make their proper use and management vitally important to people everywhere.

The world is under subsistent pressure to reduce food insecurity, soaring food prices and deepening poverty due to the projected increase in human population of about 8.3 billion by 2030 (UNPP 2008). Pastoralists and wild life have co-existed in Africa rangelands for hundreds of years. In the past, the conflicts between livestock population and wild life were minimal because the human and livestock population was small and widely dispersed. However, competition for scarce grazing land and water resources is increasing and potential for conflicts between wild life managers and livestock owners growing .And due to the multiple use of rangelands, decision for allocation of lands for conservation has often faced resistance from the pastoralists (Kideghesho, 2007).

Rangeland is prominent feature of Ethiopia and facing a degradation problem and impacts associated with it are many. Among these, degradation of range affecting the livelihood capital of the people, the existence and availability of natural resources such as organic matters, fauna and flora.

Yabelo Woreda of the Borena Zone is one of the places where rangeland is highly degraded due to different factors such as population growth, agricultural encroachment, land degradation, blocking internal migration routes and climatic variability. Therefore, research based solutions which could assist Yabelo Woreda to reserve the process of degradation and which aimed to re-establish healthy grasslands are one of value strategies used to improve the self reliance, resilience and livelihood of Yabelo Woreda population. So, this study attempted to assess the

impacts of rangeland degradation on rural pastoralists' livelihood, the causes of degradation and identified proper rangeland management techniques in the study area.

1.3. Objectives of the study

1.3.1. General objective

The overall objective of this study was to assess the impacts of rangeland degradation on the rural livelihood, identify the causes and impacts of rangeland degradation and review rangeland management techniques in the study area.

1.3.2. Specific objectives

The specific objectives of this study are:

- To assess the impacts of rangeland degradation on the rural livelihood in the study area;
- To study the causes of rangeland degradation;
- To explain the status of rangeland degradation; and
- To describe different approaches of rangeland management techniques in the study area.

1.4. Research questions

The study was attempted to answer the following research questions.

- To what extent rangeland degradation impacts on the rural livelihood in the study area?
- What are the major causes of rangeland degradation in the study area?
- To what extent rangelands are degraded?
- What are the methods used to manage rangeland resources?

1.5. Significance of the study

The purpose of this research study was to assess the impacts of rangeland degradation on livelihood of rural pastoralists, to identify the major causes and consequences of rangeland degradation and to review different techniques of rangeland management. So, the results of this study would:

- Serve as an important input for governmental and non-governmental organizations, development agencies, environmentalists, planners, policy and decision makers;
- Enriches knowledge on rangeland use pattern in the study area;
- Provides basis for other researchers as starting point to conduct further investigation in the area under study;
- May add the existing literature and serve as additional source of reference; and it would enables the concerned body and rangeland experts to take measure and fight the problem on time. No matter how the problem may perceived locally the result of this study might hold true for other similar regions in the country. Moreover, this study would better the district as there is no previously conducted investigation on the problem at hand.

1.6. Scope of the study

The scope of this study was delimitated in the selected sample Kebeles of Yabelo Woreda which were showing high level of vulnerability of rangeland degradation. This study sites was chosen due to the conditions that are highly showing the presence of range resources degradation i.e. the rangelands are changed in to cultivation land, with low productivity and the rural peoples are

suffering in food insecurity. Moreover, this study has been delimited due to the time and budget constraints to cover all areas of the district.

1.7. Limitation of the study

This study was limited by the following factors:

- Shortage of time and materials:-as this study was conducted in-work place, it would have its own negative impact on the achievements of the objectives. Similarly, budget constraints were also limited factors to afford all the necessary equipments required for the accomplishment of the research work.
- Unwillingness in some respondents of questionnaires and lack of more relevant literatures to correlate may study with others were some of the limiting factors.

1.8. Organization of the study

This study was organized in to five chapters .The first chapter was present the back ground of the problem, statement of the problem ,general and specific objectives ,research questions, delimitation and limitation of the study. The second chapter was dealt with relevant literature reviews that are essential to understand rangeland degradation. Chapter three presents the materials and methods including areal description of the study area .The fourth chapter covered the results and discussion part and the last chapter were covered conclusion and recommendations.

CHAPTER TWO

REVIEW OF RELATED LITRATURE

2.1. The concept of rangeland degradation

We define rangeland degradation as a decrease in plant species diversity, grasslands plant height, vegetation cover, and plant productivity. Recently degradation has also mean deterioration in ecosystem services and functions, such as decreased water and soil conservation, recreation values, carbon balance and so on (Ren 1985).Rangeland is considered as degraded when pastures are getting un attractive by livestock and support only low stocking rates (Rischkowsky *et al*; 2003).Thus, degradation in general manifests a decline in productivity and affects the capacity of rangeland to sustain grazing animals.

Rangeland degradation is the most extensive among the major types of current land use and few countries have less than 50% of their pastoral lands degraded (World Bank, 1992). De Queiroz (1993) suggested that the reference point for rangeland degradation when measured in terms of beef that can sustain is the potential natural community that provides the highest grazing value for beef cattle production. This indicates that one of the major aspects of rangeland degradation is reduction and productivity.

2.2. Causes of rangeland degradation

Rangeland degradation is occurring as a result of no grazing management plans, removal of vegetation for fuel wood and no clear authority of rangeland ownership .The major indicators of rangeland degradation are shift in species composition, loss of range bio-diversity, reduction in biomass production, less plant cover ,low small ruminant productivity, and soil erosion(Ahmad

and Ehgan,2012).According to the same authors pastoral communities have some realization about the range land degradation by assessing their livestock production or health, forage availability and travelling in search of forage. However ,the impact of rangeland degradation on the other services like carbon sequestration, conservation of plant and wild life bio-diversity, water harvesting and spreading infiltration and many other environmental services are either not monitored, documented or disseminated the information among the various sectors of society. The main scholarly mentioned causes of rangeland degradation are explained as follow.

2.2.1. Climate change

Climate change affects the amount and distribution of pastures and water points. Although the long term impacts of climate change are difficult to predict, the most important predictions made by climate change models are of raising temperatures and changes in precipitation with an increased number of extreme events (Mortimore *et al;*2009). Erratic and unpredictable rain fall along with extreme weather conditions and longer and more frequent droughts would affect the sustainability and efficient use of rangeland resources. The availability and productivity of grazing areas, and existence of water points, which are critical for livestock survival during the dry seasons, are bound to decline with marked consequences for mountain livelihoods. The pressures associated with human population growth, economic development, land use change, and climate change are major challenges facing rangeland development professionals and practitioners.

Rise in temperature and rainfall has been measured at the Inner Mongolia Rangeland Ecosystem Research Station in the last 20 years. With increase in temperature have come more dry land, windy periods and hence increased erosion events (Chen *et al* .2003).

2.2.2. Overgrazing

Setting stocking at higher density has commonly resulted in a decline in the most palatable perennial species and an increase in less favorable species (Oba and Kotile,2001) .UNEP single out human impact specifically, livestock grazing as being the cause of irreversible degradation which prevailed during the past two decades. According to the World Resource Institute (WRI, 1992), overgrazing is the most pervasive cause of soil degradation. The study in china showed that in some cases low lying prairie rangelands face increased salinization as a result of overgrazing (Blench and Florian, 1999).

2.2.3. Encroachment of rain feed agriculture in rangelands

Recent encroachment of rain fed cropping in to the better pasture land can be understood as a response to newly created national polices for increased food production and increased emphasis on cash crops as producers of foreign exchange (FAO,1993).Thus value exchange relationships between pastoralists and farmers have broken down .This types of range degradation is widespread in the Near and Middle East and in Africa ,particularly in the Eastern and south Eastern ,where agriculture and pastoralism in the past were in balance with environmental conditions .The accelerated rangeland degradation should be considered in parts as reflection of unequal economic development and access to resources at national and local levels; and also linked with poverty, inadequate resource management and poor infrastructure (Raj,2005).

2.2.4. Bush encroachment

Bush encroachment is the suppression of palatable grasses and herbs by encroaching woody species often unpalatable to domestic livestock (Ward,2005).The ecological succession in the Borena rangelands indicates that the potential of the grass lands is threatened by bush encroachment in many areas (Alemayehu and Mengistu,2004).

This types of degradation occurs where indigenous shrubs and trees encroach on to former grassland areas and changing them to various forms of shrubed grasslands .On the other hand ,the density of trees and shrubs may increase in to thickets or various wood types and reduce the relative amount of grass and therefore livestock production(Raj,2005). Invader bushes have started to produce seeds in abundance and so to created opportunities for establishment of new generations of bushes (Blench and Florian,1999).In some instances woody encroachment is speculated due to lack of foraging by livestock and lack of fire .Thus both over use and under use have been implicated in affecting vegetation dynamics (Herlocker,1993).

2.2.5. Sedentralization

The effect of over population and government policies on agriculture ,food availability and increased povert have contributed to the Sedentralization of pastoralists (Alemaeyu,2005).Herlocker (1999) in Alemayehu (2005) Sedentralization of pastoralists lead to concentration of people, livestock ,farming and other types of land use centered on permanent water supplies . These sites become centers of over use of range land resources and subsequently resulted in rangeland degradation and reduced bio diversity.

2.2.6. Drought

The frequent drought in the many parts of the world's dry lands and notably in Africa is a prominent factor, which has contributed to range degradation. The crisis in the pastoral production systems of the shale in the early 1970s showed the great repercussion of sequence of dry years on the range land degradation .When there is drought and over grazing together, the effect on the productivity of rangeland is double barreled (Herlocker,1993).Prolonged drought including a shortage and erratic rainfall can cause a serious range degradation .Rain fall during drought is hardly adequate to allow grasses to grow and unable to fill the surface water ponds(Alemayehu,2004).

2.3. Impacts of rangeland degradation

2.3.1 Impacts on livestock assets

The most important of assets owned by the pastoralists is their livestock .The fact that pastoralists coincides with the fact of being owner and herder of livestock .It is through the possession of animals that the full personality of the pastoralists is realized from birth to death (Brooks,N;2006).However the cumulative effect of the dramatic change in the size of grazing lands and loss of strategic pasture and water areas has already led to a severe decline in the size of the individual livestock holding and eventual destitution.

2.3.2. Impacts on soil

Long trees and shrubs have been found to improve the nutrients status of their close surroundings in semi-arid shrub communities, arid grasslands ,tropical and sub-tropical savanna ,east r n Sahel ,savanna ,eastern Africa savanna and Southern Africa savanna (Belysky *et al;*1990).All

the studies which measured carbon ,nitrogen ,phosphorus revealed consistent horizontal pattern in the top soil. The content of these elements decline gradually as a function of a distance from the trunks and significantly lower in open ground than sub-canopy soil (Georgiadis, 1989).

2.3.3. Impacts on food security

Periodic drought is a characteristic of the lowland pastoral productions in Ethiopia. Even in climatically normal years, there are localized parts of the lowlands which suffer from drought many famines of various magnitude have affected the pastoralists ,the most one is being droughts of 1973/1974,1984/1985,1994/1997,1999 to 2000 and2002 to 2003.The famines of 2002 t0 2003 was one of the worst impacts of drought in recent years ,which has claimed thousands of animal and human lives in Borena ,Somali and Afar regions. In some areas about 80% of the entire animal population is estimated to be de criminated (Yonis Berkele, 2002).

2.3.4. Impoverishment of biodiversity

According to the convention on biological diversity of article 20 “biodiversity “is defined as the variability among living organisms ,from all sources including inter alia ,terrestrial, marine and other aquatic ecosystems ,and the ecological complex of which they are part; this includes the diversity within species ,between species and of ecosystems (CBD,1992);the diversity of species on earth constitutes a natural heritage and life support system for every country and all people. But species are disappearing at 50 to 100 times the natural rate largely due to human activities including over exploitations of biodiversity, habitat degradation and fragmentation, climate change, pollution and invasion by induced species (Salim, 1999).

2.3.5. Impacts on the rangeland ecosystem

Changes in the natural vegetation dominated by the grass layer leading to dominance by woody cover, and increase in unpalatable forbs are considered as a threat to range conditions (Oba et al;2000).Overall woody vegetation reduces grass cover through increasing the competition for available water and nutrients and reducing the reaching the grass layer (Thurrow,2000).Increase in woody plant encroachment and herbaceous biomass production are negatively correlated (Gemedo Dalle,2004,Oba and Kotile,2001).

2.4. Rangeland management

Rangeland management and improvement is always a difficult task due to the interactions of various biological ,environmental and social factor .Trends have been changed from traditional range management approaches like looking and focusing only the biological factors and ignoring the social and traditional aspects of range management to community based and co-management approaches .It is hard to determine the value of rangeland in terms of environmental services like carbon sequestration ,watershed management ,bio-diversity and eco tourism .In arid and semi arid areas rangelands are the major free grazing areas for livestock all round the year (Mirza *et al;*2006,and Ahmad and Islam,2011).However, many factors such as climate, human ,animals are causing degradation of rangelands .

Most pastoralists are poor and dependent on rangeland resources .Traditional management practices were sustainable, but increasing pressure on land and in appropriate management and development policies are causing degradation of large area of rangeland. For example, it has been reported that nearly 50% of Tibetan plateau of grass lands are degraded (Wilkes, 2008).The

geographic extent and many important resources of rangelands make their proper use and management vitally important.

2.5. Pastoral livelihood

A livelihood is defined as “the capabilities ,assets(including both material and social resources) and activities required for a means of living (Carney,1998:4).Ellis,(2000:10),a livelihood comprises the assets such as natural, human, financial and social capitals ,the activities ,and access to these(mediated by institutions and social regulations)that together determine the living gained by the individual or household.

A Livelihood comprises the capabilities, assets and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhances its capabilities and assets both now and in the future, while not undermine the natural base (DFID, 2000).

2.5.1. Sustainable livelihood

The idea of sustainable livelihoods was first introduced by Brunt land Commission on the Environment and Development as way of linking socio-economic and ecological considerations in a cohesive, policy-relevant structure. The 1992 United Nations Conference on Environment and Development (UNCED) expand the concept, especially in the context of Agenda 21, and advocated for the achievement of sustainable livelihood as a broad goal for poverty eradication.

Sustainable livelihood is a livelihood that can cope with a recover from economic ,social and natural “stresses and shocks and maintain or enhance its capabilities and assets both now and in the future ,while not undermining the natural resource base” (Carney,1998:4,Scoones,1998 in

Assefa,2007).Therefore, due to the fact it considers the factors that mediate access and climes in addition to assets and activities ,the current study has adopted the definition of livelihood(Ellis;2005).

2.6. Approaches of rangeland management

2.6.1. Approaches of rangeland management in Africa

Rangeland management systems or approaches refer to all production systems use to exploit the rangeland through grazing. Rangeland management approach is a combination of many factors like biological (vegetation, animals), physical (climate, topography etc) and social (need, importance and participation).The objective of management programs may vary but optimizing the return by manipulating the range ecosystem is the ultimate goal of any management intervention. Despite its crucial contribution as a source of livelihood for an ever-increasing human population ,Africa pastoralism in particular has remained a low priority concern in development policy agendas of most governments because of the tendency to view it as a transitory mode of life with little prospect of success(Rass,2006).

African pastoral systems in the has several decades have become extremely vulnerable to recurrent livelihood shocks and negative trends that have caused a substantial and long lasting decline in the wale fear of pastoral sector. The sustainability of the pastoral mode of production has significant undermined by exposure to the exogenous pressure of natural and manmade shocks especially recurrent droughts, violent conflicts, in appropriate interventions and governance (Devereux, 2006; W/Georgis, 2008).

Rangeland development in Africa have failed to contribute towards improved bio diversity conservation and livestock production (Rohde *et al;*2006;Solomon *et al;*2007;Angassa and Oba,2008b).This has been attributed to poor understanding of ecological ecosystems and traditional practices by policy makers(Tefrea *et al ;*2007).The participation of local communities and use of their ecological knowledge could therefore help policy makers and researchers to better understand the ecosystems and contribute to sustainable management(Verliaden and Dayot,2005;Reed *et al;*2008)

2.6.2. Approaches of rangeland management in Ethiopia

Rangeland resources management in Ethiopia is a book about how a natural resource in Ethiopia's pastoral and agro pastoral areas are managed by women and men. It describes how local people often in co-operation with development organizations attempt to pursue their livelihoods from the rangelands while at the same time sustaining and conserving their environment .Both women and men living in dray land areas have an intimate knowledge of their environment ,related to their different uses and management of natural resource .Further gender has been shown to be a key determinant of rights to and benefits from natural resource(Watson,2005) while it has also been proven that gender relations have a direct impact on their use ,management and conservation. To reduce the risk of rangelands degradation Ethiopia employees different approaches of range land management in pastoral areas of the country.

2.6.3. Approaches of rangeland management in Borena Zone of Oromia Regional State

Borena pastoralists have managed their pasture and water resources by using their own indigenous knowledge and experiences without any external support and interference for about hundreds of years. This local range resources management approach was based on the interaction between grazing animals, plants and the communities with non-ling components such as rain fall, soil and minerals playing a fundamental role. In this system the role of herders is to manipulate herds mobility in accordance with available fodder and water resources(Oba 1998:3) Watson stated that Borena have strong set of range resources governing indigenous institutions that said to provide them with a coherent internal governance (Watson,2003). Access to and use of resources is shaped by several of overlapping institutions, regularized practices and a set of rules and organizational decisions (ibid).

The Borena social structure provides a frame work of which pasture and water resources management is carried out at two broad levels of traditional administrative structures (Boku 2000:34).These two levels are namely “administration from above” administration from within two levels, the former by gada system(the highest administrative body not only in resources management but also in all other social affairs of as far as Borena social structure is concerned) and the latter is the management of tula,deep wells by clan arrangement(ibd:34). Boku argued that ownership right and administrative responsibility for running the wells is based on clan while that of the pond is based on territorial units such as village or other geographic unit .The people who reside in the same madda usually meet at different water sources to discuss how to share pasture and water resources among the inhabitants using resources together (Halake 2010:32).

2.6.3.1. Traditional grazing management

Traditional knowledge in natural resources management and utilization has playing important role in improving and developing land use system in the world(Angello,1996).The pastoralists have been using the traditional grazing management in order to cope up with the relatively arid condition of the environment, Prevent grazing and ensure sustainability of the resources base. Pastoralists use flexible grazing strategies over all; their grazing management is the result of their cumulative knowledge about resources, assessment of range conditions and distribution of rain fall (Ayana, 1999).

The Borena pastoralists have managed their pasture and water resources by using their own knowledge and experiences without any external support and interference for hundreds of years. This indigenous resources management system is based on interaction between plants ,grazing animals and the local communities with non-living elements of rain fall and soil playing a key role of herders is to manipulate herds mobility in accordance with available fooder and water resources (Oba,1998:3).

2.6.3.2. Destalking

The accumulation of animals is a proven livelihood strategy ,when the primary grazing land is commonly owned and in the face of periodic disaster which threatens to reduce the herd (Kauffman *et al;* 1997).Income from livestock assets in pastoral Africa is primarily in the form of products produced from the livestock themselves ,rather than in cash obtained from the sale of the livestock .

2.6.3.3. Introducing seeds

Native grasses not only provide necessary habitat for many native animals ,they provide a sustainable pasture base for animal production and can perform well as exotic species under harsh conditions (Oba and Kotile,2001).Many exotic species with exception of buffer grass, generally fail to persist due to drought or in fertile soils (Blench and Florian,1999).

2.6.3.4. Prescribed wild fire

Wild fires usually happen during extended dry periods when soil moisture levels are low and plants are severely stressed and result in reduced forage yields and other undesirable effects (Ayana,2007).The same author stated that planning is essential to safe burning and should be done well in advance of the proposed burn date .The plan should cover objectives ,what areas to burn ,pre-fire management practices needed to meet the objectives and how to conduct the faire .

CHAPTER THREE

RESEARCH DESIGNS AND METHODOLOGY

3.1. Study area description

3.1.1. Location and size of the Yabelo Woreda

Yabelo Woreda is found in pastoral areas of Borena Zone of Oromia Regional sate, Ethiopia. Astronomically the district is located between 5^{o} 23' 12.7" North Latitude and 38^{o} 32' 52. 6" E Longitude and relatively the district is bounded by Arero district of Borena Zone in east, Mega districts of Borena Zone in the south ; Telltale district of Borena zone in the west and Dugda Dawa of Borena zone in the north. Yabelo is the capital of the Woreda which is 565 kms far from Addis Ababa. In relation to other Woreda of Borena zone Yabelo is the largest Woreda with an estimated total area of 555,000 ha (Source: Yabelo district office of rural agriculture and pastoralist development office).

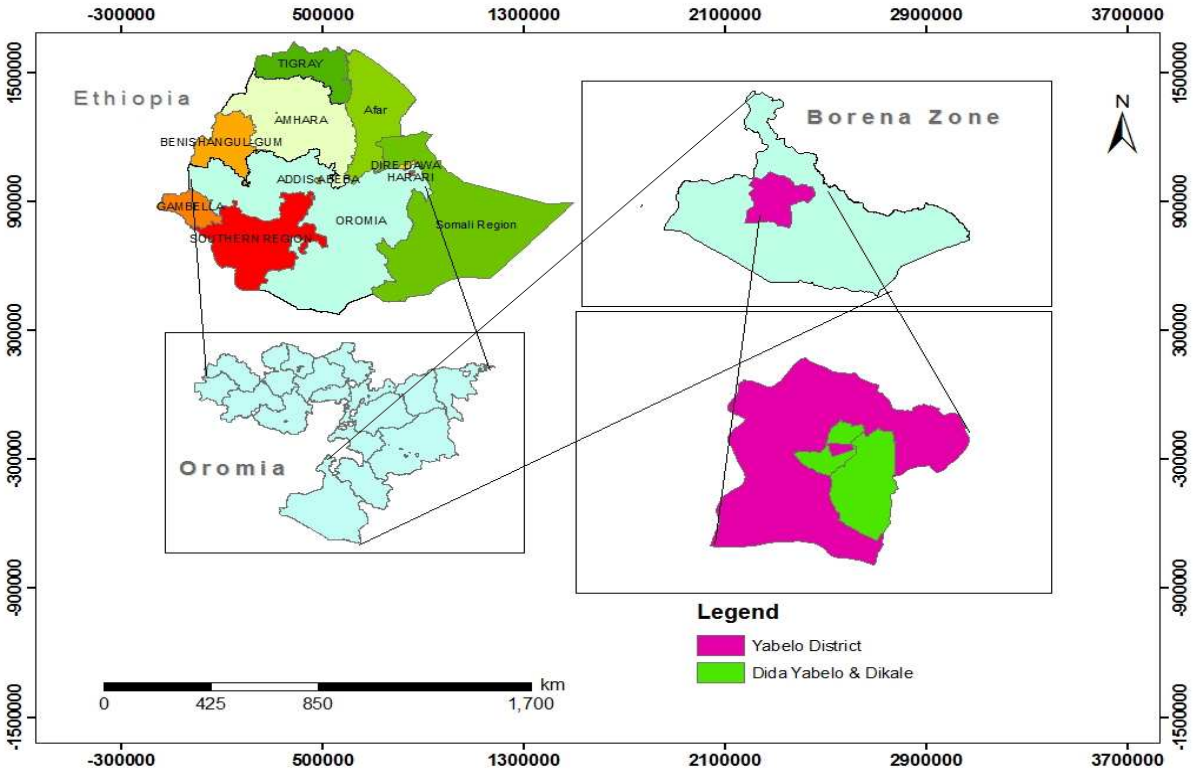

Figure 3.1.Map of satate of Ethiopia,Oromia regional state,Borena Zone and staudy area

3.1.2. Topography and Climate

The climate of the study area is hot for most of the year .The rain fall is erratic and variable and dominantly a bimodal pattern. The main rainy season is "Ganna" that runs from mid-March to the end of May and which accounts about 60% of the total rain fall occurring in the area .The short rainy season in the area is known as "Hagayya" that runs from mid-September to end of October ,which accounts 40%of the total rain fall occurring in the area .The amount of rain fall varies from a maximum of 700mm to a minimum of 500mm with an average rain fall of 600mm .The overall average temperature ranges from mean maximum 28^{o}C to mean minimum 14^{0}C.

The topography of the district dominantly composed of plains and the elevation varies from 1450m to 2200m above average sea level (source: Yabelo district office of rural agriculture and pastoralist development).

3.1.3 .Land use

According to the estimated data from Yabelo district office of rural agriculture and pastoral development about 292,028 ha (52.62) and 11,971 ha (2.19) are for grazing and cultivation respectively. The rest of land of the district is occupied by several land use patterns such as forest(both natural and manmade),bush lands ,shrub lands, open wood land, exposed sand soil surface, urban land ,un cultivated land, and others (see table 3.1 below).

Table 3.1.Land use pattern of Yabelo District

Number	Land use	Size (ha)	Percentages
1	Grazing land	292,028	52.62
2	Cultivated land	11,971	2.19
3	Forest Land	39,129	7.0
4	Dense bush land	147,000	26.49
5	Uncultivated land	62600	11.3
6	Others	2272	0.409
	Total	555,000	100

Source: Yabelo Woreda office of rural agriculture and pastoral development

3.1.4. Vegetation cover

The type of vegetation that are covered Yabelo Woreda are mostly characterized by sparse vegetation mainly composed of grasses ,natural forests like acacia tree and manmade forests like Acacia albida, Boswellia papyrifera,Casuarina equisetifolia,Commiphora Africana,Croton macrostachys,Delonix elata,Dovyalis abyssinica,Moringa oleifera,Olea Africana,Schinus molle,Sesbania sesban,and Juniperus procera.(Source:Yabelo district office of rural agriculture and pastoralist development)

3.1.5. Livestock population

The Yabelo Woreda pastoralists and agro-pastoralists are traditionally depend on cattle, goat and sheep for household food security and a few donkey, mule, camel, and chicken. Currently from the total livestock population, the largest number is taken by goat (222,779) and cattle (265,877). Sheep, camel, donkey, mule, and chicken accounts 97,011, 44,042, 6646, 833, and 92,470 respectively in 2013 (Source: Yabelo district office of rural agriculture and pastoralist development)

3.1.6. Farming System and livelihood strategy

It is known that agriculture is the back bone of Ethiopian economy and the rangelands are the major sources of livestock production. The Yabelo Woreda rangelands are dominant source of food and house hold income. According to the Yabelo Woreda office of rural agriculture and pastoralist development office there are 25 peasants associations (PAs). Out of the total population of the district about 68% deepened purely on pastoralism, 32% on agro-pastoralism for their livelihood .The cultivated and grazing land of the Woreda is estimated to be 11,971

ha (2.19%) and 292,028 ha(52.62%) respectively. Agro-pastoralism is a newly emerging phenomenon in the Yabelo rangelands.

3.1.7. Demographic characteristics

According to the Central Statistical Agency (CSA, 2007) and house hold survey data the Yabelo Woreda has a total population of 98,730 of which 49,582(50.23%) are males and 49,148(49.78%) are females .The crude densities of the Woreda is about 0.18 persons/per hector . The total population of the two selected Kebeles namely Dada Yabelo and Dikale according to the report of Yabelo Woreda pastoral Development Bureau (2013) is about 527 and 816, respectively.

3.2. Research methodology

3.2.1. Research design

The research approach that was applied in this study was mixed research approach, which involves both qualitative and quantitative approaches to investigate a complex problem. This approach was used because efforts were made to have better insights and understanding about the impacts of rangeland degradation on the pastoral livelihood of the district. Thus, the combination of qualitative and quantitative techniques were used to conduct this study by cross checking the relevance and accuracy of the data or information that were gathered through different tools and techniques. The trust worthiness of a study can be ensured if the findings of one method are sub stained by the other (Creswell et al; 2003 cited in Degefa, 2005).

3.2.2. Sample size and technique

A two stage sampling technique was utilized to collect the primary data. Firstly, two villages Dikale and Dida Yabelo were selected purposively out of 25 Kebeles in the district. At this stage very great care was taken to select Kebeles that would represent the district in terms of physical, socio-economic and organizational characteristics sufficiently. Following this, the sample household heads were selected from each kebele using systematic random sampling method. Accordingly, about 527 and 816 registered households in Dikale and Dida Yabelo villages are identified.

To determine the sample size (n) of the households those to participate in the study; the sampling formula which was developed by Cochran, was used with a desired degree of precision for general population. In this case, population variable (p) is a household unit variable which is given as:

$n = NZ^2PQ/d^2 (N-1) + Z^2PQ$ where; n=sample size of house hold

P= housing units variable (rural household)

Q=Town household=1-p

N=total number of housing units

Z= Standardized normal variable and its value that corresponds to

95% confidence interval equals 1.96

d= allowable error

According to the data obtained from districts agriculture and pastoral development office (2014), there are about 98,730 household units; out of this 12,341 households (p) are town inhabitants.

Hence; $n= (98730)\ (1.96)^2(0.96)\ (0.04) / (0.05)^2(98730-) + (1.96)^2(0.04) =59$

Therefore n = 59 was the minimum sample size of housing units for reliable results .However, to be safe in case of non-cooperativeness of household, unforeseen problems during data collection and other cases the sample size was increased to 85 household heads. Then, the sample size was taken from each village on the basis of household proportion. Accordingly 34 (40%) respondents from Dikale and 51(60%) respondents from Dida Yabelo have been taken.

3.2.3. Types and sources of data

Both primary and secondary data were gathered for this research .The primary data which was utilized to this study were open and close-ended household questionnaires, focused group discussion, key informant interviews and photographs. Secondary source of data such as reports of different years from the district office, books (published and unpublished) from the Addis Ababa University and Adama science and Technology institute, journal, internet, research articles and documents of different years from the Oromia regional state pastoral development and rangeland management office were utilized for this study**.**

3.2.4. Procedures and tools of data collection

In the study both primary and secondary data were used by employing quantitative and qualitative methods. The primary data were collected by using structured and semi structured interviewing guides. The questionnaires were filled by sample households living in two villages and interview was held with numerous individuals ranging from the elder group community to

officials and experts in the field. Some of the interviewees were elderly persons, kebele official's youngsters, women's, development agents (DAs), and experts at the district office of the pastoral development and rangeland management office. Focused Group Discussion was also conducted with elder pastoralists who have been there for a long period of time to gather information related to historical records of the rangeland resources.

3.2.4.1. House hold survey

To collect the socio economic, organizational and institutional situations of users, on house hold assets and, demographic information from the sample household's structure interview questionnaire was used. The issues covered in the survey were demographic information of sample respondents, educational back grounds of sample respondents and their families, livelihood information including the main source of households' livelihood, causes and consequences of rangeland degradation, rangeland ownership and trends of degradation among the private and communal lands, and rangeland management practices in the study area. Accordingly a survey of 85 sample respondents in two Kebeles was undertaken. In conducting interview Four enumerators who have knowledge about the area ,culture and language have been recruited and trained before the work of filling questionnaires and participated under the data collection under the serious guidance of me throughout the data collection based on the schedule and filled the questionnaires carefully .

3.2.4.2. Field observation

To understand the grass root level causes, level of degradation and impacts of rangeland degradation on the pastoral livelihood the researcher captured various data through observation and documented them through photographing. Therefore, attempts were made in the assessment

of rangeland degradation and its impact on the rural livelihood of pastoralists and the problem is serious in the study area so that some recommendations are suggested and pastoralists are motivated to mobilize their community on the issue and to take measures on time.

3.2.4.3 Focus group discussion

In this study two FGD each of them contain six group members were undertaken among the adult pastoralists of Dida Yabelo and Dikale kebele residents. Accordingly, four focused group discussions (FGD) two in each Kebeles of sample site was conducted with elder farmers who have been lived for a long period of time, and information about historical back grounds of rangeland resources, trends of rangeland degradation, causes of rangeland degradation, impacts of rangeland degradation on pastoralists livelihood best management practices in the district and practices needed to be partied in the area and the responsibilities of the pastoral communities on the rangeland degradation issues ,the role of governmental and non-governmental institutions on rangeland management and finally how to sustain the rangelands to the future generation was clearly discussed among the group members of focus group discussion so that information was gathered for recommendations .

3.2.4.4. Key informant interview

Interview scheduled was undertaken with elder persons, Kebeles officials, women's, youngsters, Development Agents, district officials pertain to rangeland resources and pastoral development and NGOs such as PCDP.

3.2.4.5. Secondary data

Secondary source of data was gathered from already above mentioned source to complete this study.

3.2.5. Methods of data analysis

The data that were collected through different techniques were analyzed by describing and narrating (qualitatively) and using descriptive statics (quantitatively).Therefore, qualitative data was analyzed by using qualitative analysis techniques such as described and narrated in words. Quantitative data that was collected from sample households was analyzed by using stastical data analysis techniques such as SPSS Package Soft Ware Program, descriptive statics such as, mean, frequency, percentages and chi-square tests were used.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1. Socio-demographic and economic characteristics of respondents

4.1.1. Age and sex composition of sample respondents

Age and sex composition of house hold head was found to be an important factor that influences rangeland resources and livelihood situation of households in the developing countries like Ethiopian in general and study district in particular. Accordingly in the study area sex and age composition of sample house hold respondents was investigated in the survey**.** From the total sample house hold head respondents about (55%) were within the age group of 31-45 years while 20% were within the age of 15-30 years and about 18% are found within the age of 45-55 and the remaining 5% and 2% found within 56-65 and above 65 years old respectively (Table 4.1 depicts age of the sample respondents). The sex ratio of the respondents was dominated by male respondents'. Out of the total sample respondents about 91% was covered by male while the remaining 9% were females which were shown below in (Table 4.2). The greater involvement of males in the study is because of males' willingness to participate in the study their availability at the field and females work load as compared to male participants in the area under investigation.

Table.4.1.Age of the sample respondents in Dikale and Dida Yabelo Kebeles

Age	Respondents Dikale and Dida Yabelo Kebeles		Total	
	Dikale	Dida Yabelo	Frequency	Percentage
15-30	2	15	17	20
31-45	23	24	47	55
46-55	7	8	15	18
56-65	2	2	4	5
Above 65	0	2	2	2
Total	34	51	85	100

Source: household survey

Therefore, from table 4.1 we can observe that respondents are found in different age groups which are important to understand the impacts and cause of rangeland degradation and to receive different information regarding the rangeland management techniques from the different age groups with different understanding level.

Table 4.2. Sex of sample respondents in Dikale and Dida Yabelo Kebeles

Sex	Respondents Dikale and Dida Yabelo Kebeles		Total	
	Dikale	Dida Yabelo	Frequency	Percentage
Male	26	51	77	91
Female	8	0	8	9
Total	34	51	85	100

Source: household survey

Out of the total participants of the study about 98%were found within the productive age group and hence it is rational that they are engaged in different economic activities and could be actively participated in rangeland rehabilitations program or strategy and will give a chance to achieve the objectives of the study effectively.

4.1.2. Marital status of respondents

Marital status of respondents in the pastoralist environment has a significant role in the resource utilization management, and over all situations of pastoralist livelihood, so that marital status was included under the survey questionnaires and the status of sample respondents in terms of marriage was investigated under the survey.

Accordingly, results of the study showed that about 95% of the respondents were married and 4% of the totals were divorced and the rest 1% were windowed and there was no single participant in terms of marital status in the household survey study (Table 4.3)

Table 4.3.Martial status of sample respondents in Dikale and Dida Yabelo Kebeles

Marital	Respondents Dikale and Dida Yabelo Kebeles		Total	
	Dikale	Dida Yabelo	frequency	Percentage
Single	0	0	0	0
Married	31	50	81	95
Divorced	2	1	3	4
Windowed	1	0	1	1
Total	34	51	85	100

Source: household survey

4.1.3. Educational status of respondents

Educational levels of the society affect house hold decision. It determines the welfare of the society such as income, health, and their attitude towards using of natural recourses like rangelands. It may also enable the house-hold to have wide vision of their local environment. So the educational status of respondents was assessed in the survey. According to the data collected from the survey, 82% of the respondents were illiterates, 9% can read and write and the rest 9% of the respondents attained primary education. From the study participants there was no any respondent who attained secondary, preparatory, technical or college diploma and degree education.

Table 4.4.Educational background of sample household heads or respondents in Dikale and Dida Yabelo Kebeles

Educational status	Respondents in		Total	
	Dikale	Dida Yabelo	Frequency	Percentage
Illiterates	32	37	69	82
Read and write	2	6	8	9
Primary education	0	8	8	9
Secondary education	0	0	0	0
Preparatory	0	0	0	0
Diploma	0	0	0	0
Degree	0	0	0	0
Total	34	51	85	100

Source: household survey

In general, table 4.4 shows that there is low level of literacy rate among the sample respondents and this will be a challenge for awareness creation of rehabilitation program or strategy of the rangeland improvement in the study area. So, there is a need to work hard on the education sector to minimize the threat following educational back ground of the respondents and to achieve a better food security without degrading the rangeland resources.

4.1.3.1. Educational status of member households of respondents

The data obtained from the sample respondents also indicated that the rate of illiteracy was high among the members of sample households in the study area. Accordingly, 71% were illiterates, 11% read and write, 5% attained primary education, 11% secondary education and the reaming house hold members attained preparatory, college diploma and degree out of the total 445 investigated household members. The educational back grounds of member households of study sample Kebeles are depicted below in (Table 4.5).

Table 4.5.Educational background of household members of sample respondents in Dikale and Dida Yabelo Kebeles

Literacy level	Respondents in		Total	
	Dikale	Dida Yabelo	Freq.	%
Illiterates	124	192	316	71
Read and write	46	4	50	11
Primary education	11	13	24	5
Secondary education	5	43	48	11
Preparatory education	1	1	2	0.5
Some college or technical Diploma	2	2	4	0.9
Degree	1	0	1	0.2
Total	190	255	445	100

Source: household survey

4.1.4. Household size

The size of household members in the sample Kebeles is also an important factor to determine consumption of rangeland resources by respective households' members. Thus, family size of each house hold was considered under the survey data collection. The average size of household respondents is 10; with maximum house-hold of 18 and minimum size two. Table 4.6 –below depicted that 60% of sample households of the respondents have family size between 9-11,while 10% of them have family size between 2 and 5 ;other 30% have a household family size of between 12 and 20.

Table 4.6. Households' family size of respondents in Dikale and Dida Yabelo Kebeles

Family size	Respondents in		Total
	Dikale	Dida Yabelo	
2-5	2	5	5
6-8	7	8	15
9-11	11	15	26
12-14	5	7	12
15-17	8	5	13
18-20	1	11	12
Total	34	51	85

Source: household survey

In general the survey indicated that 90% of the sample respondents have household size of 10.Therefore, the study area is highly characterized by fastest growth of human population so that large family size. This largest house hold size may be a serious challenge to achieve food security within a short period of time and asset building process also take a long period of

time . Moreover, when the human population is increasing at alarming rate, it is a more serious to resist the impacts of rangeland degradation.

4.1.5. Ethnic group of respondents

From the total participants who were involved in the study about 85% were Borena, and the remaining 15% were Guji ethnic groups (Table 4.7). So ,the results of study indicates that the study area is characterized by almost homogeneous ethnic groups and this might be a good opportunity to understand the local problems easily in the study area and might also create opportunity for the realization of the this research study objectives.

Table 4.7. Ethnic groups of sample respondents in Dikale and Dida Yabelo Kebeles

Ethnic group	Respondents in		Total	
	Dikale	Dida Yabelo	frequency	Percentage
Borena	29	43	72	85
Guji	5	8	13	15
Somali	0	0	0	0
Others	0	0	0	0
Total	34	51	85	100

Source: household survey

4.1.6. The main source of livelihoods of respondents

The livelihood characteristics of a given society in one way or other determine the way that societies interact with their environment. Thus, it was found important to dig out information about the livelihood characteristics of each sampled household under the study. Accordingly,

animal husbandry is the commonly practiced old age economic system; as the ecological settings of the district is more suitable for animal rearing than for crop cultivation. The study area pastoralists keep various stock types such as cattle, goats, sheep, camel, and equines. Cattle keeping are the most favored one as cattle, besides serving as a main source of livelihood, is associated with some social values as well. That means the pastoralists of the study area are proud of having large size of cattle than other animal population size. However, they do not consider the impacts of large number of cattle size on the rangeland environment.

As indicated in Table 4.8 below about 73% of the sample household respondents stated that the major source of livelihood activities in the study area is animal production and about 27% crop cultivation. According to the data obtained from the study household pastoralists, animal production as the main source of their economy can take a lion share as a means of livelihood in the years between 2012 -2013 and followed by a newly developed economic activity in the area crop cultivation. Based on the data obtained from respondents the productivity of the cattle and rangelands is highly degraded and households are in the state of livelihood problem or food insecurity.

However, according to the inhabitants of the district rangeland, who were pure pastoralists in the past, are currently begin combining crop farming with animal husbandry and practicing agro-pastoral economic system.

Table 4.8. Main source of livelihood of respondents in Dikale and Dida Yabelo Kebeles

Main source of livelihood	Respondents in		Total	
	Dikale	Dida Yabelo	frequency	Percentage
Animal production	25	37	62	73
Crop cultivation	9	14	23	27
Sale of fire wood and charcoal	0	0	0	-
Others	0	0	0	-
TOTAL	34	51	85	100

Source: household survey

As indicated in the above table animal production in the district is the main source livelihood. Thus, the single most important source of cash for the households is the sale of animal products such as butter, milk and milk products and fatten ox. In fact, to date extremely poor pastoralists begin some crop cultivation activities in the area with support of regional government in the area.

4.1.7. Trends of range lands in supporting pastoral livelihood

About 78% of household respondents stated that the role of rangelands in supporting pastoral livelihood is poor and need to be improved .But about 28 % of the respondents stated that there is a moderate contribution of rangelands in supporting pastoral livelihood in the study area (Table 4.9).

Table 4.9.Trends of rangelands in supporting pastoral livelihood in Dikale and Dida Yabelo Kebeles

Trends of rangelands in supporting livelihood	Respondents in		Total	
	Dikale	Dida Yabelo	frequency	Percentage
Poor	27	39	66	78
Moderate	7	12	19	22
Good	0	0	0	0
Others	0	0	0	0
Total	34	51	85	100

Source: household survey

4.2. Trends in rangeland degradation in the study area

All informants said that shrinking of rangeland is one of the common event of which pastoralists encountered (Table 4.10). According to the respondent's oral history, the district rangeland degradation was very much faster at present than past. All respondents believed that hundred percent (100%) rangelands are in decreasing or shrinking trend in the study area and this can be indicated in terms of reduction in annual income ,decrease in livestock productivity and shortage in terms of fire wood and charcoal.

Table 4.10. Perception of respondents about the trends of rangeland degradation in Dikale and Dida Yabelo Kebeles

Yes/No	Respondents in		Total	
	Dikale	Dida Yabelo	Number	Percentage
Yes	34	51	85	100
No	0	0	0	0
Total	34	51	85	100

Source: household survey

According to the respondents the most important indicator of rangeland degradation is decrease in livestock productivity followed by reduction in annual income (Table 4.11). Information regarding to the indicators of rangeland degradation can depicted below in the table.

Table 4.11. Indicators of rangeland degradation in Dikale and Dida Yabelo Kebeles

Indicators	Respondents in		Total	
	Dikale	Dida Yabelo	frequency	Percentage
Reduction of annual income	5	7	12	14
Shortage of fire wood and charcoal	3	2	5	6
Decrease in livestock productivity	24	39	63	74
Loss of biodiversity	2	3	5	6
Others	0	0	0	0
TOTAL	34	85	85	100

Source: household survey

Therefore, the data obtained from the sample households show that respondents are identified the indicators of rangeland degradation. Accordingly, the main indicators are decresase in livestock productivity and annual income which accounts 74% and 14% of respondents respectively. .In addition, to these losses of bio-diversity and shortage of fire wood and charcoal are also indicators of rangelands degradation.

4.2.1. Land use and trends of rangeland degradation

The use of land for different purposes over a number of years was common in pastoral and agro-pastoral areas of the Borena low lands. However, to date trends in land degradation is increasing. According to the survey, 81% of respondents indicated that overgrazing is the most important cause of rangeland degradation (4.12)

Table 4.12.Percption of respondents about the land use and rangeland degradation in Dikale and Dida Yabelo Kebeles

Land use	Respondents in		Total	
	Dikale	Dida Yabelo	frequency	Percentage
Grazing land	29	40	69	81
cultivation land	5	11	16	19
Unknown	0	0	0	0
Total	34	51	85	100

Source: household survey

4.2.2. Communal and private land use and degradation

The sample household respondents stated that in the study area there was a land which is used communally and privately. Almost hundred percent (100%) respondents in the (Table 4.13) indicated that land was distributed both privately and communally.

Table 4.13.Frequency and percentage distribution and Chi-square test results of respondents about communal and private land use and range land degradation

Kebeles	Which one is degraded ;communal/private	Respondents		Ch-square test (X^2)
Dikale		frequency	%	14.235
	Communal	28	83	
	Private	6	17	
	Total	34	100	
Dida Yabelo	Communal	43	84.3	24.02
	Private	8	15.7	
	Total	51	100	

Source: household survey

As indicated on table 4.13 in both Kebeles; Dikale and Dida Yabelo, the frequency, and percentage distribution is high on the communal land degradation than the privately used land. Also, the calculated chi-square test in table 4.13 is greater than critical value X^2=9.49 implying that there is statically significant difference between the communal and private lands. In this regard, since the difference observed was statistically significant it is assumed that the communal

land is at high rate of degradation than the private land. The result suggests that it is much better to privatize the pastoral lands to refrain from the degradation and to create sense of ownership among the pastoral communities of the study area in terms of conservation and utilization. Respondents also stated that over utilization of communal rangelands was common in the past and continue still today without any about the degradational issue everybody may use as possible.

4.2.3. Access to rangelands

Rangelands are fundamental sources of assets to the rural households and communities where many of their activities are directly linked to local level resources endowment such as land, forest, water, and so on. Although the availability of these resources matters, pasture or grazing land and water, among the others is very necessary resources to pastoral economy in the study area. Indeed newly developing crop cultivation plays a significant role in contributing the livelihood of many pastoral households to secured food through direct production or source of generating income. Despite the variations in access and ownership rangelands are the main sources of income and food for all sections of pastor community. However, respondents stated that there is no enough accessibility and ownership of rangelands at private level. Following these focus group discussants stated that we need land privately because our communal lands are lacking ownership and they are more degraded than privately used lands (Table4.14).

Table 4.14.Respondents information about land ownership in Dikale and Dida Yabelo

Kebeles

Owners of the excess land	Respondents in		Total	
	Dikale	Dida Yabelo	frequency	Percentage
Clan leader	0	0	0	0
Communal	34	51	85	100
Government	0	0	0	0
Others	0	0	0	0
Total	34	51	85	100

Source: household survey

4.3. Respondents information about the causes of rangeland degradation

The degradation of rangelands in pastoral area has greatly been threatened the pastoral livelihoods and thereby left the majority of poor pastoralists under chronic food insecurity. The situation of dry lands becomes worsened when coupled with manmade disasters. Under this condition making sustainable livelihood is difficult though pastoralists are able to make it possible. In this environment livestock production is dominant livelihood activities. However, pastoralists are unable to produce sufficient food from livestock production. The shortage of pasture together with scarce rainfall combined with other constraints have challenged the pastoral production system and hence affected remarkable food availability at household level in particular and at community level in general according to the sample respondents of study area.

According to the survey almost all of the respondents know the causes of rangeland degradation and needs rehabilitation program of degraded rangelands (Table 4.15).

Table 4.15. Respondent's perception about the causes of rangeland degradation in Dikale and Dida Yabelo Kebeles

Yes/No	Respondents in		Total	
	Dikale	Dida Yabelo	No	%
Yes	34	51	85	100
No	0	0	0	0
Total	34	51	85	100

Source: household survey

According to data obtained from the survey the most important causes for the degradation of rangelands is human related (Table 4.16) and need to be mitigated.

Table 4.16. Chi-square value, frequency and percentage distribution of natural and human causes of rangeland degradation

Question type	Kebeles	Alternative rating scales	Respondents view about the human and natural cause of rangeland degradation		Ch-square test (X^2) result
Which one the most important cause of rangeland degradation	Dikale		Frequency	%	16.94
		natural	5	14.7	
		human	29	85.3	
		Total	34	100	
	Dida Yabelo	Natural	9	17.6	21.35
		human	42	82.4	
		Total	51	100	

Source: household survey

Therefore, from the above table we can observe that the frequency and percentage distribution is higher by human causes than from natural causes. Moreover, the statistical test value confirmed that the difference of both natural and human causes of rangeland degradation and the computed Chi-square value X^2=16.94, and 21.35 at Dikale and Dida Yabelo ,respectively exceeds the critical value, X^2=9.49.Thus, human activities are the main causes of rangeland degradation than natural factors.

4.3.1. The main cause of rangeland degradation

4.3.1.1. Livestock population pressure

According to the respondents livestock population is one of the decisive factors affecting rangeland productivity. If a number of livestock or livestock population density in a given area is imbalance with available resources, it obviously causes rangeland degradation. The problem of rangeland degradation due to the cattle population is one of the cause pastoralists currently facing in the study area. This is so partly because of increase in number of livestock and partly decreases in rangelands resources and inverse increases in number of animals per area. According to the sample survey data conducted in the study area, there was about 36045 cattle, 42543 sheep, 25678 goats, and 8231 camel (CSA, 2007). According to Yabelo district Pastoral Development Bureau report of 2013, the total grazing and bush land area of the district is about292028ha and 147000ha respectively. So, it is necessary to calculate livestock density over area as follow: Total number of livestock/land area=112497/306728ha= 0.37 livestock/ha, which is very difficult to survive. This stock density is not constant over a given area because of frequent livestock mobility caused by variation in resource scarcity and availability problem. But what is important here is that, district pastoralists keep multi-species livestock type of which

some are grazers and others are browsers. This, to some extent would minimize pressure over grazing land.

4.3.1.2. Bush encroachment

Bush encroachment is one of the serious problems in the district rangelands. The invasion and expansion of noxious plants is one of the main problems of rangeland ecosystem and diminishes the functionality of rangelands. According to, focus group discussant of both Dikale and Dida Yabelo kebele encroachment on to rangeland is not a new phenomenon but currently reaches its highest climax point. Moreover, bushes grow very close to each other and make the grass inaccessible for livestock. Yabelo pastoralists used to apply fire as a measure of controlling bush expansion in the past and in some sites today. Pastoralists use fire firstly; it serves as a means of mitigating bush expansion problem and growth of non-palatable plants. Secondly, using range fire enhances the growth of fresh grass. Thirdly, it eliminates the parasites which are harmful to the animals. According to the Yabelo Woreda Pastoral Development and rangeland management Bureau report of 2013, 26.49 percent of the land area of the Woreda is converted to bush land. It seems that by considering this problem that government and different non-government organizations such as PCDP were engaged in bush clearing activity but they could not solve the problem.

Regarding to the bush encroachment as cause of range land degradation Heitschmidt (2004) also confirmed that encroachment of rain feed agriculture is one of the mounting problem in Borena rangelands. The same author also stated that invasion and expansion of noxious plants is one of the main threats to the integrity of rangeland ecosystem and diminishes the functionality of rangelands. Bush encroachment is one of the mounting problems in Borena rangeland.

Figure 4.1. Photos taken by researcher during focused group discussion from Dikale sample site.

4.3.1.3. Drought

All of the respondents stated that scarcity of rainfall is one of the main causes of rangeland degradation in the district rangelands. The area receives low annual rainfall which is not sufficient and the problem is increasing from time to time. FGD participants of Dida Yabelo and Dikale Kebeles stated different ways in which this affects resource management. Firstly, fodder availability depends on adequate amount of rainfall and resource depletion takes place when rainfall is below the expected amount. Similarly, water for animals becomes inadequate. Secondly, in most cases the rainfall received is unevenly distributed over space and time. Some areas receive sufficient amount of rainfall while others receive less or no rainfall at all. In such

occasion, the people who live in the area with inadequate rainfall are forced to move with their livestock to the area with relatively better rainfall. It is clear that this results in undesirable consequences both on the pastoralists and the rangeland environment. Moreover, it brought about concentration of large number of animals that exceeds carrying capacity of the range. The final outcome is over grazing and subsequent environmental degradation. All in all, it is undeniable fact that, climate change is currently one of the global pressing problems in general and for pastoralists in particular. Because of the fact that pastoral life is vulnerable to climate related problems as they depend on the environmental natural resources of which rainfall or water and pasture are the two most important one. This leads to the conclusion that drought for consecutive years can resulted in degradation of rangelands and creates a serious livelihood problem in the study area several times and still now pastoralists' are at the risk of drought problem.

Figure.4.2. Photo of focused group discussants from Dida Yabelo taken by researcher during focused group discussion over the degraded rangelands

4.4. Impacts of range land degradation in the study area

4.4.1. Perceptions of pastoralists about rangeland degradation and its impact on livelihood

Assessment of pastoralists' perception over the impacts of rangeland degradation and pastoral livelihood reveals that impacts were clearly known and all of the respondents are fear of degradation and problems associated with it (Table 4 .17).

Table 4.17. Respondent's perception about the productivity of rangelands decline

Kebeles	Rating scales	Respondents		Ch-square test (X^2) result
Dikale		frequency	%	23.05
	Partially	3	8.8	
	Extremely	31	91.2	
	Total	34	100	
Dida Yabelo	partially	7	13.7	26.84
	Extremely	44	86.3	
	Total	51	100	

Source: household survey

Therefore, the computed chi-square value X^2 =23.05 and 26.84 in both Kebeles is greater than the critical table value X^2=9.49 at 0.05 level of significance .So, this indicates that there is a significant difference between the respondents perception about the extent rangeland productivity decrease. This implies that the productivity of rangelands is extremely decline in

both Dikale and Dida Yabelo Kebeles. Moreover, the frequency and percentages can also clearly depict the extent of rangeland degradation clearly in the study area.

4.4.2. The main impacts of rangeland degradation in the study area

Despite the little variations among the respondents, the main impacts of rangeland degradation was identified and ranked based on the level of their impact on the pastoralists overall social economic, environmental, institutional and political setup in the study area. From the total sample respondents, about 22% of interviewed pastoralists mentioned that the decline of rangeland product both in terms of quantity and quality is the primary impacts of rangeland degradation followed by death of livestock population which accounts about 13 of the total respondents' and ranked as second main impacts of rangeland degradation. Therefore, assessment of pastoralists' perception on the impacts of rangeland degradation confirmed with research findings and show detail consequences of rangeland degradation in the study area from the different angles of pastoralists perceived. In general, deaths of livestock, loss of harvest, incensement of crop price, food shortage and reducing price of livestock are the main impacts of rangeland degradation investigated in the study area (Table 4.18).

Table 4.18. Respondent's perception about the main impacts of rangeland degradation

Impacts	Ranks at		Total		Ranking results
	Dikale	Dida Yabelo	No	%	
Decline of rangeland product(quantity and quality	9	17	26	22	1st
Death of livestock	6	9	15	13	2st
Food shortage	3	5	8	7	5th
Loss of harvest	5	6	11	9	3th
Incensement of crop price	3	6	9	8	4th
Migration of household members for employment opportunity	2	3	5	4	7th
Reducing price of livestock	4	3	7	6	6th
Increase in distance to be travelled to feed animals	2	2	4	3	8th
Deaths of household members	0	2	2	1.8	9th
Total	34	51	85	100	

Source: household survey

Figure.4.3. Degraded rangeland in the past which was covered by grasses and short trees but today under the serious gully erosion taken by the researcher during filed observation.

As we can observe and understood from image above on cannot expect the problem of rangeland degradation in the future rather can conclude about the problem of which rangelands are extremely degraded and immediate actions are needed to be undertaken to save the pastoral community from this catastrophe which is resulted from both natural and human related factors.

4.5. Approaches of rangeland management

4.5.1. Perception of sample respondents about the rangeland management practices

The Borena pastoralists in general and study area settlers in particular have their own rangeland management strategies appropriate to deal with the erratic rainfall in African dry lands. So that the district pastoralists as part of Borena pastoralists in Southern Ethiopia have well established traditional system of range and water management. About 25% of respondents stated that they have developed efficient system of managing range resource. However majority of respondents stated that at current time there is no efficient rangeland management system which can be feet with the current rangeland use. Accordingly in the area under study vartion was observed regarding to the rangeland management system. Table 4.19 below depicted the respondents information on the rangeland management practices.

Table 4.19. Chi-square value, frequency and percentage distribution of natural and human causes of rangeland degradation

Kebeles	Alternative rating scales	Respondents view about rangeland management practices		Ch-square test (X^2) result
Dikale		frequency	%	9.52
	Yes	8	23.5	
	No	26	76.5	
	Total	34	100	
Dida Yabelo	Yes	6	11.8	29.84
	No	45	88.2	
	Total	51	100	

Source: household survey

In the survey respondents were asked to give information about the rangeland management practice. In this regarded, the computed chi-square value X^2=9.52 and 29.84 respectively in both Kebeles is greater than the critical value X^2=9.49 .Therefore, the results of Chi-square value show that there is statistically significance between the alternatives yen and no and this shows that there is no rangeland management practices in the under study which can minimize or reduce the current rate of rangeland degradation.

4.5.2. The most important rangeland management techniques identified in the study area

The district rural pastoralists have long established traditional rangeland resources management approaches. Thus, indigenous practices of rangeland resources management systems were assessed in this study .The most important rangeland management techniques that need to be practiced in the study area to better the current status of rangelands were identified and ranked by sample respondents during the survey which is showed on the table below.

Table 4.20. Rangeland management techniques ranked by respondents from the most effective to less effective.

No	Rangeland management techniques	Ranks in		Total		Ranking results from most effective to less effective
		Dikale	Dida Yabelo	No	%	
1	Planting trees	4	2	10	12	5th
2	Introducing participatory rangeland management	3	1	15	18	1st
3	Managing the grazing land by moving the stock from one pasture to another	2	3	5	6	8th
4	Destalking	1	4	7	8	7th
5	Providing supplementary feed	8	6	9	11	6th
6	Improving traditional rangeland management	5	5	12	14	3rd
7	Introducing new seeds	9	8	11	13	4th
8	Prescribed wild fire	6	7	13	15	2nd
9	Shift the location of pastoralists	7	9	3	4	9th

Source: household survey

In general, there is a need to implement different types of rangeland management techniques in the study area .But the most important rangeland management techniques preferred by respondents in the study area is introducing participatory rangeland management techniques preferred by the society in the study area according to the respondents of sample survey. Providing supplementary food ,improving traditional rangeland management techniques and planting trees were also another important rangeland management techniques which were ranked following participatory rangeland management approach.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1. Conclusion

In east African counties like Ethiopia where the human and animal population grows rapidly, rangelands are degraded at alarming rates to make the way for growing of crops, bushes are encroached, land becomes fragmented and over utilized to meet the demand for pastoral livelihoods and to achieve food security among households. According to the survey study rangelands are over degraded peoples are suffering in food insecurity.

The causes of rangeland degradation are due to different interrelated socio-economic, demographic and political factors. The major causes which are identified in the study area are both human and natural. These are including bush encroachments, expansion of farmlands in to range lands, overgrazing, over population, over utilization, and natural factors such as drought or lack of rainfall over a long period of time and etc. Conversions of rangelands in to agricultural lands, shifting bush land in to farmland, urbanization, and settlement patterns of pastoralists are other additional causes which accelerate the trends of rangeland degradation. Like many other rural areas in Ethiopia rangelands resources of the area are extremely degraded. According to the data collected from pastoral local elders, through focus group discussion (FGD), more than half of their respective village was converted in to bare land which was in the past covered by small trees, and strong and drought resistant grasses decades ago. In the past rangelands were in the

healthy condition where bio-diversity is safe, humans and animals are enjoyed in food security and degradation of rangelands and food insecurity are not expected to be happen.

The assessment of rangeland degradation situation in the district clearly depicted that the vast majority of pastoral inhabitants in the villages use the rangelands as sources of their livelihood despite of sever degradation. Especially from the others human population pressure and cattle population pressure are the main cause for the degradation of rangeland degradation. Household size, low educational status, low awareness to the role of rangelands ,lack of alternative means of income ,lack of private rangelands that excess amounts of rangelands are communal and lack of sense of ownership among the pastoral households are also another cause for the degradation of rangelands and the resulting effect livelihood problem in the study area.

During the filled survey environmental condition in the villages was observed and that the results of rangeland degradation on the environment particularly on bio-diversity, soil erosion, impoverishment of rangeland ecosystem and water avilliabilty are strong. The result of survey also showed that loss of fauna and flora, high bush encroachments, drought and fluctuations of rainfall which impact the productivity of rangelands was common phenomenon.

From overall discussions in the forgoing chapter in general it is evident that the pastoral households in Yabelo district faced a number of interlocked problems. Sever rangeland degradation, rainfall variability, extreme poverty, low production resources and income base, rapid human and cattle population growth and low productivity of natural resource were among the weakness to rangeland conservation, management and sustainable development in the study area.

5.2. Recommendations

It has already been indicated that the scope of this research study is limited to two Kebeles in Yabelo district. But, the findings of the study could be used to suggest a number of policy measures that could minimize the rangeland degradation problems and would brings sustainable range resources conservation elsewhere in the Ethiopia. As can been seen from the results of this study, the rangeland resources of the area is endangered. The causes and processes that are affecting this range resource are also many and diverse. This requires the alleviations of root causes of the problems so that it would at least minimize. Therefore, the following research based solutions are recommended:

- Generally, poverty is the major cause of environmental degradation in general and rangelands degradation in particular. So, in order to achieve food security in pastoral parts of Ethiopia in general and in the study area in particular attempts should be made to increase the real income of pastoral households which release dependency on the rangeland resources only.
- Diversification of pastoral livelihood in another way out to improve food security situation of study population. Strengthen the existing and promoting the establishments of new local level enterprises that substitute rangeland dependence and funding them with financial credit and technical assistance ,monitoring and evaluation of the progress would enable the pastoralists to generate supplementary income and thereby access to food.
- The study reveals that several households have not enough rangeland and could not produce enough food for their family. Thus, I recommended that their need to be fair distribution of rangelands among the pastoral households and resettle those households to other unoccupied part of the country.

- As the survey data analyses of variable indicate that, family size highly affects rangeland resources in the area .Moreover, the area is characterized by increasing population density by the Ethiopian pastoral standard on the national and regional average which could have contributed to the prevailing severe environmental degradation .Contrary to this ,most of the pastoralists have not well informed about family planning and the problems related to lager family size. Therefore, those concerned bodies should make more attempts in this aspect so that the pastoralists are able to have family size which is balanced with their economy or means of livelihood.
- Encouraged the committed individuals, organizations and educating the local people about the importance of rangeland resources and thereby rangeland conservation. In addition, providing drought tolerant tree and grass species to meet the fuel wood demand and animal fodder instead of relying on the existing range resources.
- The degradation of rangelands led for poor productivity of pasture to livestock feed and hence decease in livestock yields for human consumption or income earning. Therefore, supply of supplementary livestock feed helps to minimize the adverse effect on livestock and human population. This can be done by storing local feed when supply is abundant and by facilitating the supply of feed to pastoralists on credit basis. The current intervention of non-governmental organizations on the rangeland improvement and development in the study area can be exemplary and should be encouraged and strengthen. Over all efforts help to improve the availability of sufficient food from the livestock production.
- The practices of destocking and restocking should be appreciated and strengthened. During restocking priority should be given for more vulnerable groups of society. The traditional attitude to have large livestock population size is highly influential in the area so that

pastoralists do not practice livestock sale in normal years. Therefore, pastoralists need to be taught on such practices and awareness must be created .Besides, working jointly with Borena pastoralists and other concerned bodies can help realization of this objective that have been intended to achieve.

- Incorporation of local knowledge and rangeland conservation system. Despite the pressures that increasingly undermined the indigenous knowledge and management system, rangeland area management plans should start from the bottom that is from the local peoples who boren, grow their and already know and do well, so as to secure the pastoral livelihoods of the local community and sustain the diversity of natural resources on which they depend on and transfer to the future generations.
- Any policy and programs aimed towards rangeland conservation and management should not ignore the socio-economic reality, especially the existing apparent socio-economic difference among the users. It further implies that just changing the legislation to provide local autonomy to the user's community may not be sufficient condition for better management in the face of highly rangeland based existing pastoral livelihood system and acute state of poverty of the masses. Therefore, it would be important to support the local management initiatives by providing valuable and affordable and viable alternatives to employment opportunities to reduce the existing rangeland based economic dependency.
- An important policy implication of present analysis indicate that the scope of reducing the existing level of rangeland resources use is nether possible nor desirable for the prevailing subsistence pastoral economy without viable affordable options in the face of growing population pressure and limited supply of resources .So, emphasis should be given to

better the existing resource use and management and more equitable sharing of the benefit from the rangeland resources.

- Pastoralists active participation in designing ,implementing various projects aimed at improving rangeland condition or productivity should be promoted .It is only with active involvement or participation of local community that development efforts can be realized .
- Pastoralists' active participation in designing and implementing various projects aimed at improving rangeland condition or productivity should be promoted. It is only with active involvement or participation of local community that development efforts can be. So, any governmental and non-governmental organization should consult in planning a new program and must create awareness among residences of anew project or program and the community should not be enforced if not accepted by majority.
- The government should introduce and subsidize close stove types, so that low income groups can be benefited it.

.

REFERENCE

Abule Ebro, (2005). The influence of woody plants and livestock grazing on grass species composition, yield and soil nutrients in the Middle Awash Valley of Ethiopia. Journal of Arid Environments 60, 343-358.

ACDI/VOCA,(2008). *Ethiopia Pastoralist Livelihoods Initiative Livestock Marketing (PLI-LM)* Online Retrieved on January 27, 2010 from: http://www.acdivoca.org/acdivoca/PortalHub.nsf/ID/ethiopiaPLI Addis Ababa, Ethiopia.

Ahmad, S. And M. Islam, (2011). Rangeland productivity and improvement potential in highlands of Balochistan, Pakistan. *Biomass - Detection, Production and Usage, Darko Matovic* (Ed.), ISBN: 978-953-307-492-4, In Tech, pp. 289-304

Ahmad, S.S. and H. Ehsan, (2012). Analyzing the herbaceous flora of Lohi Bher Wildlife Park under variable environmental stress. *Pak. J. Bot.,* 44(1): 11-14.

Alemayehu, M , (2004). Rangelands Biodiversity: Concepts, Approaches, and the Way Forward. and Agro-pastoralist Areas of Ethiopia. ELTAP, Addis Ababa.

Angassa, A., Oba, G., (2008a). Effects of management and time on mechanisms of bush encroachment in southern Ethiopia. African Journal of Ecology 46, 186-196.

Angello Joseph Mwilawa, N.K.R.Musimba and R.S.Kiduna, (1996). Traditional Rangeland management techniques.

Ayana Angassa , (2007). The Dynamics of Savanna Ecosystems and Management in Borena

Belsky, A.J., (1990). Tree/Grass Ratios in East African Savannas: A Comparison of Existing Models. *J. Biogeograph.* **17**:483–489.

Blaxter, P.T., (1994). Pastoralists are People. Why Development for Pastoralism! In Rural Extension Bulletin No.4. In: Alemayehu Mengistu, 2004. Rangelands Biodiversity: Concepts, Approaches and the Way Forward.

Blench, R. & Florian, S., (1999). Understanding Rangeland Biodiversity. Chameleon Press, London.

Boku Tache , (2000). Individualizing the Commons: Changing Resource Tenure Among Boren Oromo of Southern Ethiopia. MA Thesis. Addis Ababa University, Department of Social Anthropology

BLPDP, (2004). Borana Low Land Pastoralist Development Program Documentation on Seven

Brooks, N. , (2006). Climate Change, drought and pastoralism in the Sahel. Discussion note for the World Initiative on Sustainable Pastoralism. [Online]. Retrieved on April 9, 2009 from: www.cru.uea.ac.uk/~e118/welcome.htm#adaptation.

Carney, D, (1998). Implementing the Sustainable Rural Livelihoods Approach. In Carney, D. (ed.). Sustainable Rural Livelihood: What Contribution Can We Make? Russell Press Ltd, Nottingham

Carswell, G. , (2000). Livelihood diversification in Southern Ethiopia. IDS working paper 117.

Chen, Z. Z., Wang, S. P., and Wang, Y. F. , (2003). Update progress on grassland ecosystem research in Inner Mongolia steppe. *Chinese Bulletin of Botany* 20, 423–429.

Degefa Tolossa, (2005). Combining Qualitative Data and Quantitative Data in Food Security Research. Working Paper No.5. Trondheim: ACTA GEOGRAPHICA.

Devereux, S, (2006). Vulnerable livelihoods in Somali region, Ethiopia. Research Report No. 57, Institutive of Development Studies, University of Sussex.

FAO,(1993). Guidelines for land use planning. FAO Development Series 1, Food and Agricultural Organization of the United Nations, Rome, Italy.

FAO (Food and Agriculture Organization), (2001). News & highlights: Forestry forum spotlights poverty alleviation. Rome, Italy.

Gemedo Dalle, Maass, B.L. and Isselstein, J. (2006). Encroachment of Woody Plants and Its Impact on Pastoral Livestock in the Borena Lowlands Southern Oromia, Ethiopia. Afr. J. Eco., 44: 237-246.

Georgidis, N.J. , (1989). Microhabitat Variation in an African Savanna: Effect of Woody Cover and Herbivores in Kenya. *J. Trop. Ecol.* **5**:93-108.

Halake Dida, (2010). The Impacts of Development Interventions on Customary Institutions of Forest Resource Management among the Borana Oromo of Southern Ethiopia. Addis Ababa University, Department of Social Anthropology.

Harris R B, (2010). Rangeland degradation on the Qinghai-Tibetan plateau: A review of the evidence of its magnitude and causes. Journal of Arid Environments, 74 (1): 1-12.

Heitschmidt R, (2004). Is Rangeland Agriculture Sustainable? Journal of Animal Science 82: E138-146

Kauffman J. B., Robert L. B., Nick, O. & Danna, L, (1997). An Ecological Perfective of Riparian and Stream Restoration in the Western United States. Fisheries, 22; 12-24.

Kideghesho J, Røskaft E and Kaltenborn B , (2007). Factors influencing conservation attitudes of local people in Western Serengeti, Tanzania. Biodiversity and Conservation, 16 (7): 2213-2230.

Mirza, S.N., S. Ahmad and M. Islam. (2006). The vagaries of drought in Balochistan and strategies to reduce economic losses. *Bal. J. Agri. Res.,* 3(1): 39-42.

Msc. Thesis Presented to the school of graduate studies of Alemaya University, Dire DawaEthiopia .55p.

Nori *et al.* , (2008). *Browsing on fences. Pastoral land rights, livelihoods and adaptation to climate change.* IIED issue paper no. 148.

Norwegian University of Life Sciences (UMB).

Oba, G., (1998). Assessment *of Indigenous Range Management Knowledge of the Booran Pastoralists of Southern Ethiopia.* Borena Lowland Pastoral Development Programme (BLPDP/GTZ), Negelle, Ethiopia.

Oba, G. and Kotile, D. G. , (2001). Assessments of Landscape Level Degradation in Southern Ethiopia: Pastoralists Vs Ecologists. A Paper Prepared for the International Conference on Policy and Institutional Options for the Management of Rangelands in Dry Areas. May 7 - 11, 2001.

Oba, G., Post, E. , Syvertsen, P. O., Stenseth, N. C., (2000). Bush Cover and Range Condition Assessments In Relation To Landscape and Grazing In Southern Ethiopia. *Landsc Ecol* 15; 535-546.

Raj, K., (2005). The Impact of Rangeland Condition and Trend to the Grazing Resources of a Semi-arid Environment in Keny. J. Hum.Ecol., 17(2); 143-147.

Rass, N, (2006). Policies and strategies to address the vulnerability of pastoralists in sub-

Reed, M.S., Dougill, A.J., Baker, T.R., (2008). Participatory indicator development: What can ecologists and local communities learn from each other? Ecological Applications 18, 1253-1269.

Ren, J. Z., (1985). 'Grassland survey and planning.' (Agricultural Press: Beijing.) [In Chinese]

Resources Utilization in Selected Pastoral Communities of Tanzania.PP. The Africa PastoralismForum. Pastoral Information Network Program. Working paper series No.11 December, 1996.

Rischkowsky B., Hohnwald S., Kreye C., Schultze-Kraft R., Camarão A. P. & King J. M., (2003). Degraded Pastures in the Bazilian Eastern Amazon: Smallholder Management Leads to High Phytodiversity. Rangelands as Dynamic Systems – Biodiversity Conservation in Rangelands: why and how. *African J. of Range & Fora Sc.*, 20; 80-88.

Rohde, R.F., Moleele, N.M., Mphale, M., Allsopp, N., Chanda, R., Hoffman, M.T.,Magole, L., Young, E., (2006). Dynamics of grazing policy and practice: 178 environmental and social impacts in three communal areas of southern Africa. Environmental Science & Policy 9, 302-316.

.Schlesinger, W. H., Abrahams, A. D., Parsons, A. J., & Wainwright, J. (1999). Nutrient losses in runoff from grassland and shrub land habitats in Southern New Mexico: I. rainfall simulation experiments. *Biogeochemistry*, 45, 21-34.

Sidahmed, A.E., and J. Yazman, (1994). Livestock production and the Environment in lesser developed countries. p. 13-31. In: J.

Solomon, T.B., Snyman, H.A., Smit, G.N., (2007). Cattle-rangeland management practices and perceptions of pastoralists towards rangeland degradation in the Borana zone of southern Ethiopia. Journal of Environmental Management 82, 481-494.

Somalis and Borana. A paper presented at the 6th International Conference on the Ethiopian Economy, 3–6 July, Addis Ababa, Ethiopia.

Somalis and Borena. A paper presented at the 6th International Conference on the Ethiopian Economy, 3–6 July, Addis Ababa, Ethiopia.

Sora Adi, (2007). Management of Livestock and Range Resource Emerging Trends in Pastoralist Southern Ethioipia. PhD Thesis in Environmental and Development Studies, Noragic,

Tefera, S, B. Dlamini, A. Dlamini, and V. Mlambo, (2007). Current range condition in relation to land management systems in semi-arid savannas of Swaziland. Afr J Ecol 46: 158–167.

UNCED, (1992). Agenda 21 United Nations Conference on Environment and Development. United Nations General Assembly: New York

UNDP (Unite Nation Development Program), 2008, Human Development Report, WWW.undp.org.

UNDP. Promoting Sustainable Livelihoods: A Briefing Note Submitted to the Executive Committee, June 4, 1997

Verlinden, A., Dayot, B., (2005). A comparison between indigenous environmental knowledge and a conventional vegetation analysis in north central Namibia. Journal of Arid Environments 62, 143-175.

W/Giorgis, T, (2008). Local conflict-poverty-governance nexus: Case studies from Ethiopian

Ward, D., (2005). Do We Understand the Causes of Bush Encroachment in Africa Savannas? *Africa Journal Range and Forage Science, 22: 101-105.*

World Bank, (2008). World Development Report. World Bank, Washington, DC.

WRI (World Resources Institute), (1992). *World Resources* 1992–1993, Oxford University Press, New York.

Yazman, (1994). Livestock production and the Environment in lesser developed countries. p. 13

Years of Field Experience, Volume I: Overview of Borana Pastoral Production and Livelihood System. BLPDP. Addis Ababa, Ethiopia.

Yonis Berkele, (2002). Magnitude of famine in pastoral areas of Ethiopia. Proceedings of the

Appendix-1

Research Questionnaire

The questionnaire is designed by a post graduate student from India Gandhi national Open University to conduct a thesis research in partial fulfillment of masters Degree (MA) in Rural Development. Its main objective is to collect factual information to assess the rangeland degradation and its impact on the pastoralist's livelihood in Yabelo Woreda.

The questionnaires are fully for academic research purpose and any information that you provide will be kept confidential and valid .The results of this study that depends on your data is expected to help different stakeholders including you, policy and decision makers to take appropriate measures to further improve rangeland resources and draw lessons in expanding similar activities. Thus, your cooperation is very necessary to achieve the desired goal of the study.

Thank you in advance for your cooperation

Ketema Urga Serda

Enrolment NO: **ID1364682**

Email:-ketema_urga@yahoo.com

Tel:+251 911-015462

General direction to respondents

- For questions that demands for your opinion, please try to describe honestly.
- You can also give your opinion in Oromic or English language
- Please tick or write your answer on blank space provided.

Annex.no.1-Semistructured questionnaire for sample household survey. Please put tick (√) or write at appropriate place.

Name of data collector_____date_____

Section -I-Socio-demographic information of respondents.

Personal back ground

1. Name of informant_____

2. Sex: Male ☐ Female☐

3. Age: 15-30 ☐ 56-65☐

31-45 ☐ above-65 ☐

46-55 ☐

4. Marital status

Single ☐ Divorced ☐

Married ☐ Widowed ☐

5. Ethnic group

Borena ☐ Guji ☐ Somali ☐ Others please specify_____

6. Educational status

Illiterate ☐ preparatory education ☐

Read and write ☐ college or technical Diploma ☐

Primary education ☐ Degree ☐

Secondary education ☐

7. Household members demographic information (please fill the following box by put the exact number of your household members) Male ☐ Female ☐

8. Household members literacy assessment; please exclude the respondent and fill the following table.

Literacy level	No of family members	Remark
Illiterates		
Read and write		
Primary education		
Secondary education		
Preparatory education		
Some college or technical Diploma		
Degree		

Section-II-Household economic/livelihood/ information. Please tick, or write appropriate response.

9. What are the main sources of livelihood activities you engage on?

Animal production ☐ Sale of fire wood and charcoal ☐

Free relief aid ☐

Crop cultivation ☐ If others specify_____

10. If your main economic activity is animal production? For what purpose do you keep them?

_____

_____

_____

11. What is your total amount of income you earn from production? Please provide the annual amount income in birr for years 2012-2013.

No	Source of income	2012(income in birr)	2013 (income in birr)
1	Sale of cattle		
2	Sale of camel		
3	Sale of goat		
4	Sale of milk and butter		
5	Sale of donkey		
6	Sale of mule		
7	Crop cultivation		
8	Sale of forest products		
9	Off-farm activity		
10	Others specify_____		
	Total		

12. The current trends of rangelands in supporting pastoral livelihood in your kebele is?

Poor ☐ moderate ☐ good ☐ others specify_____

Section-III-Questions related to rangeland degradation and its impact on the pastoralists livelihood in the selected sample Kebeles of Yabelo Woreda Borena Zone. Choose "yes "or "no" answers by tick or put your response at the appropriate place that you perceive right.

13. Do you think that rangelands are in decreasing trend in your kebele?

Yes ☐ No ☐

14. Do you have access to rangelands? Yes ☐ No ☐

15. If your answer in number '14' is no who is the owner of the land in your kebele?

Clan leader ☐ Government ☐

Communal ☐ others specify_____

16. Is there a land that you have use privately and communally with people in your kebele?

Yes ☐ No ☐

17. If your answer for question number '16'is yes which one is degraded?

Communal ☐ private ☐

18. Do you know the cause of rangeland degradation?

Yes ☐ No ☐

19. If your answer for question number '18' is yes, which one is the most important cause in your locality? Natural ☐ Human impact ☐

20. Do you believe that rangeland degradation impacts on pastoralist's livelihood in your kebele? Yes ☐ No ☐

21. Is there a rangeland management practices in your kebele? Yes ☐ No ☐

Section-IV-General questions related to rangeland degradation and its impact on the pastoral livelihood. Please tick (√) one point from the given alternatives that you perceive best or give appropriate response.

22. How much do you considered the productivity of rangelands decline in your kebele?

Partially ☐ Extremely ☐ unknown ☐

23. Which one is the most important indicator of rangeland degradation in your kebele?

Reduction of annual income ☐ Loss of biodiversity ☐

Shortage of fire wood and charcoal ☐ others specify_____

Decrease in livestock productivity ☐

24. Which type of land use highly degraded the rangelands?

Grazing land ☐ cultivation land ☐ I don't know☐

25. Please read each of the following causes of rangeland degradation and decide whether you agree, strongly agree, disagree, or strongly disagree.

Key: strongly agree (1), Agree (2), Disagree (3) and strongly disagree (4),undecided (5)

No	Causes	1	2	3	4	5
1	Bush encroachment					
2	Overgrazing					
3	Cattle and human population pressure					
4	Poor policy focus on pastoral development					
5	Improper settlement pattern					
6	Expansion of farmlands in to range lands					
7	In appropriate development intervention					
8	Conflict over the scarce resources					
9	Regional policy that affects pastoral movement					
10	Climatic conditions(i.e. drought)					

26. Please rank the following impacts of rangeland degradation on your livelihood based on their level of influence.

No	Impacts	Rank
1	Decline of rangeland product(quantity and quality)	
2	Death of livestock	
3	Food shortage	
4	Loss of harvest	
5	Incensement of crop price	
6	Migration of household members for employment opportunity	
7	Reducing price of livestock	
8	Increase in distance to be travelled to feed animals	
9	Deaths of household members	

27. Please read each of the following rangeland management techniques and rank from the most effective to less effective in your kebele?

No	Rangeland management techniques	Rank
1	Planting trees	
2	Introducing participatory rangeland management	
3	Managing the grazing land by moving the stock from one pasture to another	
4	Destalking	
5	Providing supplementary feed	
6	Improving traditional rangeland management	
7	Introducing new seeds	
8	Prescribed wild fire	
9	Shift the location of pastoralists	

Section-V-Please answer the following open ended questions?

1. Is the rangeland condition worsening or getting better in your locality? If your answer is getting worse, please list the major indicators?

_____

_____

_____

_____

2. Do you think that humans can impact on rangelands? If your answer is yes please list the means by which humans have impacted on rangelands in your locality?

_____

_____

_____

3. Are there other socio-economic impacts of rangeland degradation on the society in your surrounding? If yes please list them?

_____

_____

_____

_____.

4. What do you suggest to minimize rangeland degradation in your local area? For instance, what should be done by the following bodies?

Government_____

_____

_____

NGOs_____

_____

_____.

Pastoral community

_____

_____

_____

Annex-No.2-Points to Guide Focus Group Discussion

1. In your opinion to what extent rangeland degradation has been affecting the pastoral livelihood of Yabelo Woreda?

2. Do you believe that pastoralism survive in the future? If yes; what are the favorable condition to do so? And if no, what do you think the reason?

3. What do you think the causes of rangeland degradation in your locality?

4. What are the impacts of rangeland degradation on the livelihood of Yabelo Woreda pastoralists?

5. What do you suggest for the future concerning activities to minimize the impacts of rangeland degradation on the pastoral livelihoods and to strengthening traditional rangeland management techniques?

Annex-No.3-Points to Guide key informant interview.

Section-I-Interview questions for elder persons and kebele officials

1. In your opinion what is the trend of pastoral livelihood assets in terms of supporting household's food security?

2. What do you think the major causes of rangeland degradation that have been threaten the livelihoods of the Yabelo Woreda pastoralists?

3. How do you see the trends of the causes of this problem?

4. How these causes of rangeland degradation impacts on major livelihood assets of your community?

5. In your opinion which segment of the community members of the Yabelo Woreda pastoralists is highly affected by rangeland degradation problem?

6. In your opinion what traditional adaptation mechanism the community has been practicing in reducing the impacts of range land degradation?

7. Among the local rangeland management techniques that have been practiced by local community which one do you found to be effective under the current rangeland conditions? Why?

8. What are the alternative sources of income practicing by local community to cope with the impacts of rangeland degradation on their livelihood?

Section-II-**Interview questions for Development Agents and district officials parting to rangeland resource management and pastoral development office.**

1. Do you consider that rangelands are shrinking in Yabelo Woreda?

2. What is considered as a major problem leading to the degradation of rangelands in the Yabelo Woreda?

3. What are the human and natural causes that can aggravate rangeland degradation in the Yabelo Woreda?

4. Do you believe that rangeland degradation impacts on the pastoral livelihood? If yes to what extent?

5. Do you involve rural range dependent group in designing and development of rangeland resources management?

6. Do you have any policy statement regarding environmental education? If yes, what does it say?

7. Do you believe that environmental policy and rangeland management plan incorporates the pastoral livelihood? If yes, to what extent?

8. What are the recent actions that have been taken by government to reduce the impacts of rangeland degradation?

9.If you have any opinion about the rangeland degradation and its impact on the pastoral livelihood which is not mentioned by me, I would appreciate if you could mention it?

Section-III-Interview questions for NGOs.

1. Do you think that rangeland degradation is a serious problem in Yabelo Woreda? If yes, what do you think the causes of the problem?

2. Do you believe that rangeland degradation have been impacted on the pastoralist's livelihood in the Yabelo district? If yes, to what extent?

3. Is there other impacts rangeland degradation other than pastoral livelihood?

4. What roles your organizations play in reducing environmental problems like degradation of rangelands?

5. What are the supporting mechanisms that have been practiced by NGOs in reducing the impacts of rangeland degradation to improve the livelihood situation of pastoralists?

6. What actions need to be taken to reduce the risk of rangeland degradation sustainably?

7. If you have any opinion about the rangeland degradation and its impact on the pastoral livelihood which is not mentioned by me, I would appreciate if you could mentioned on it?

PERFORMA FOR SUBMISSION OF M.A (RD) PROPOSAL FOR APPROVAL

Signature:_____

Name of Guide: Mulugeta Taye (PhD, Associate professor)

Address of Guide: Tel: +251 911 34 57 28

E-mail:mulutaye45@gmail.com

Addis Ababa, Ethiopia

Name and address of the student:

Name: Ketema Urga Serda

Enrolment No: ID 1364682

Address: Tel: +251 911 01 54 62

E-mail: ketema_urga@yahoo.com

Addis Ababa, Ethiopia

Name of student Center: St.Mary' University

Date of Submission: **11 January 2015**

Name of Guide: Mulugeta Taye (PhD, Associate professor)

Title of the project: - AN ASSESSMENT OF THE RANGELAND DEGRADATION AND ITS IMPACT ON THE LIVELIHOOD OF RURAL PASTORALISTS: IN THE CASE OF YABEL WOREDA OF BORENA ZONE, OROMIA REGIONAL STATE, ETHIOPIA.

Signature of the student: _____

Approved /Not approved

Date: **11 January 2015**

INDIRA GANDHI NATIONAL OPEN UNIVERSITY (IGNOU)

SCHOOL OF CONTINUING EDUCTION

MAIDAN GARHI NEW DELHI

A RESEARCH PROPOSAL ON:-

AN ASSESSMENT OF THE RANGELAND DEGRADATION AND ITS IMPACT ON THE LIVELIHOOD OF RURAL PASTORALISTS: IN THE CASE OF YABELO WOREDA OF BORENA ZONE, OROMIA REGIONAL STATE, ETHIOPIA.

SUBMITTED TO: INDIRA GANDHI NATIONAL OPEN UNIVERSITY (IGNOU)

SCHOOL OF CONTINUING EDUCATION POST GRADUATE PROGRAMS,

St.MARY'S UNIVERSITY, ADDIS ABABA, ETHIOPIA

SUBMITTED BY: KETEMA URGA SERDA, STUDENT OF MASTER'S PROGRAM IN RURAL DEVELOPMENT,MARD

Enrolment NO: **ID1364682**
Tel:+251 911 01 54 62
Addis Ababa, Ethiopia

TABLE OF CONTENTS

1. Background of the Study

1.1 Introduction

Rangeland degradation is the most extensive among the major types of current land use pattern and few countries have less than 50% of their pastoral lands degraded (World Bank, 1992). De Queiroz (1993) Suggested that the reference point for rangeland degradation when measured in terms of beef that can sustain is the potential natural community that provides the highest grazing value for beef cattle production. This indicates that one of the major aspects of rangeland degradation is reduction in productivity.

Rangeland degradation is a worldwide problem which constitutes the largest biome (major ecological system). Its impact has recently been serious problem due to the multiple causes such as climate change (increase in temperature, expansion of tropical cattle disease, loss of bio diversity, and drought), increasing in human and animal number or population which creates pressure on range resource management regimes (Ellis,2008).Pastoralism is a livelihood which extensively followed across the world. It supports twenty million peoples, being practiced in 25%of the world and providing 10% of the worlds meat production (FAO, 2001).

However, research studies about pastoralism as livelihood strategy and rangeland resources around the world and at large in Africa depicts that, there is a marked deterioration of rangelands with a shift in vegetation composition, i.e. decrease in the proportion of unpalatable grasses, bushes/shrubs and absence of water in the rangeland which conforms to other reports (Abule, 2005).

African pastoral systems in the several decades have become extremely vulnerable to recurrent livelihood shocks and negative trends that have caused a substantial and long lasting decline in

the wale fear of pastoral sector. The sustainability of the pastoral mode of production has significantly undermined by exposure to the exogenous pressure of natural and manmade shocks especially recurrent droughts, violent conflicts, in appropriate interventions and governance (W/Georgis, 2008).

Rangeland development in Africa have failed to contribute towards improved bio diversity conservation and livestock production (Angassa and Oba,2008b).This has been attributed to poor understanding of ecological ecosystems and traditional practices by policy makers (Tefrea et al ;2007).The participation of local communities and use of their ecological knowledge could therefore help policy makers and researchers to better understand the ecosystems and contribute to sustainable management (Reed et al;2008)

In Ethiopia, rangelands perform numerous functions that have significant ecological and livelihood values for many parts of the lowland pastoralists and agro pastoralists. The rangelands of Ethiopia cover more than 60% of total area and are the major sources of livestock feed (BLPDP and PFE, 2004).These areas are characterized by low land plains relatively harsh climate with low moisture, unreliable and erratic rain fall and high temperatures (Ayana, 2007).Of the total livestock population of the country about 40% cattle, 75% goat, 25% sheep, and almost 100% of camels are raised in the rangelands (Alemayehu, 2004). Moreover, in Ethiopia about eight to nine million pastoralists (ACDI/VOCA, 2008) of an estimated national population of 70.7 million (World Bank, 2008), harbor Africa's largest livestock population. Pastoralism is cultural and economic system that determines and is determined by social structure, resources management, productivity, trade and social welfare mechanisms in communities founded on livestock rearing as primary economic activity (Nori et al;2008).

However, studies shows that, in Ethiopia gaps in the conservation, reserve network leave the regions of rangeland particularly under representation in formerly protected areas. Remaining rangeland in the country is threatened by unsustainable land use, specially overgrazing, bad farming, mining and conservation to crop lands. Pastoralism has been subjected to multiple pressures which have undermined its resilience as way of life. Given the incentives and support, however, it could prove to be an even more productive and valuable aspect of rural livelihoods, not least of all because so many people depend on it for their sustenance.

So, recognizing this for different actors is an attempt to help pastoralists in the study area in various ways from identifying the causes and consequence of rangeland degradation to introducing different types of rangeland management techniques based on the rangeland resources and strengthen the traditional institutions to reduce rangeland degradation through proper management and finally improve pastoral livelihoods .Therefore , in line with these this study will prepare a base line assessment and documentation to review the current status of rangeland degradation and its impact on rural pastoral livelihood in selected Kebeles of Yabelo Woreda of Borena Zone with a special focus on the causes that are leading to prevailing situations and its impact on pastoral livelihood.

1.2. Statement of the problem.

Rangeland provides a wide variety of goods and services desired by society including livestock forage or grazing, wildlife habitat, water, mineral resources, wood products, wild recreation, open space and natural beauty or quality of environment. The geographic extent and many important resources of rangelands make their proper use and management vitally important to people everywhere.

The world is under subsistent pressure to reduce food insecurity, soaring food prices and deepening poverty due to the projected increase in human population of about 8.3 billion by 2030 (UNPP 2008). Pastoralists and wild life have co-existed in Africa rangelands for hundreds of years. In the past, the conflicts between livestock population and wild life were minimal because the human and livestock population was small and widely dispersed. However, competition for scarce grazing land and water resources is increasing and potential for conflicts between wild life managers and livestock owners growing .And due to the multiple use of rangelands, decision for allocation of lands for conservation has often faced resistance from the pastoralists (Kideghesho, 2007).

Rangeland is prominent feature of Ethiopia and facing a degradation problem and impacts associated with it are many. Among these, degradation of range affecting the livelihood capital of the people, the existence and availability of natural resources such as organic matters, fauna and flora.

Yabelo Woreda of the Borena Zone is one of the places where rangeland is highly degrading and suffering from the shrinking of rangelands due to different factors such as population growth, agricultural encroachment, land degradation, blocking internal migration routes and climatic variability. Therefore, research based solutions which can assist the Yabelo Woreda to reserve the process of degradation and which aim to re-establish healthy grasslands are one of value strategies used to improve the self reliance, resilience and livelihood of Yabelo Woreda population. So, this study will try to assess the impacts of rangeland degradation on rural pastoralists' livelihood, the causes of degradation and identify proper rangeland management techniques in the study area.

1.3. Objectives of the study

1.3.1. General objective

The overall objective of this study will be to assess the impacts of rangeland degradation on the rural livelihood, identify the causes and impacts of rangeland degradation and review rangeland management techniques in the study area.

1.3.2. Specific objectives

The specific objectives of this study will be:

- To assess the impacts of rangeland degradation on the rural livelihood in the study area;
- To study the causes of rangeland degradation;
- To explain the status of rangeland degradation; and
- To describe different approaches of rangeland management techniques in the study area.

1.4. Research questions

The study will try to answer the following research questions.

- To what extent rangeland degradation impacts on the rural livelihood in the study area?
- What are the major causes of rangeland degradation in the study area?
- To what extent rangelands are degraded?
- What are the methods used to manage rangeland resources?

1.5. Significance of the study

The purpose of this research study will be to assess the impacts of rangeland degradation on livelihood of rural pastoralists, to identify the major causes and consequences of rangeland degradation and to review different techniques of rangeland management. So, the results of this study will:

- Serve as an important input for governmental and non-governmental organizations, development agencies, environmentalists, planners, policy and decision makers;
- Enriches knowledge on rangeland use pattern in the study area;
- Provides basis for other researchers as starting point to conduct further investigation in the area under study;
- May add the existing literature and serve as additional source of reference; and it will enables the concerned body and rangeland experts to take measure and fight the problem on time. No matter how the problem may perceived locally the result of this study will hold true for other similar regions in the country. Moreover, this study will better the district as there is no previously conducted investigation on the problem at hand.

1.6. Scope of the study

The scope of this study will be delimitated in the selected sample Kebeles of Yabelo Woreda which are showing high level of vulnerability of rangeland degradation. This study sites will be chosen due to the conditions that are highly showing the presence of range resources degradation i.e. the rangelands are changed in to cultivation land, with low productivity and the rural peoples

are suffering in food insecurity. Moreover, this study can be delimited due to the time and budget constraints to cover all areas of the district.

1.7. Limitation of the study

This study will have the following limitations:

- Shortage of time and materials:-as this study will be conducted in-service, it will have its own negative impact on the achievements of the objectives. Similarly, the budget allocated for this research is not adequate to afford all the necessary equipments required for the accomplishment of the research work. Logistic problem is also being considered as a limiting factor.
- Unwillingness in respondents of questioners and the presence of reliable socio-economic data will also be the limiting factors of this study.

1.8. Organization of the study

This study will be organized in to five chapters .The first chapter will present the back ground of the problem, statement of the problem ,general and specific objectives ,research questions, delimitation and limitation of the study. The second chapter will deals with relevant literature reviews that are essential to understand rangeland degradation. Chapter three will presents the materials and methods including areal description of the study area .The fourth chapter will cover the result and discussion part and the last chapter will cover conclusion and recommendation.

2. Research design and methodology

2.1. Study area description

2.1.1. Location and size of the Yabelo Woreda

Yabelo Woreda is found in pastoral areas of Borena Zone of Oromia Region, Ethiopia. The district is bounded by Arero district of Borena Zone in east, Mega districts of Borena Zone in the south ; Telltale district of Borena zone in the west and Dugda Dawa of Borena zone in the north. Yabelo is the capital of the Woreda which is 565 kms far from Addis Ababa. In relation to other Woreda of Borena zone Yabelo is the largest Woreda with an estimated total area of 555,000 ha (Source: Yabelo district office of rural agriculture and pastoralist development office).

2.1.2. Topography and Climate

The climate of the study area is hot for most of the year .The rain fall is erratic and variable and dominantly a bimodal pattern. The main rainy season is "Ganna" that runs from mid-March to the end of May and which accounts about 60% of the total rain fall occurring in the area .The short rainy season in the area is known as "Hagayya" that runs from mid-September to end of October ,which accounts 40%of the total rain fall occurring in the area .The amount of rain fall varies from a maximum of 700mm to a minimum of 500mm with an average rain fall of 600mm .The overall average temperature ranges from mean maximum 28^{o}C to mean minimum 14^{0}C.

The topography of the district dominantly composed of plains and the elevation varies from 1450m to 2200m above average sea level (source: Yabelo district office of rural agriculture and pastoralist development).

2.1.3 .Land Use

According to the estimated data from Yabelo districts office of rural agriculture and pastoral development about 292,028 ha (52.62) and 11,971 ha (2.19) are for grazing and cultivation respectively. The rest of land of the district is occupied by several land use patterns such as forest(both natural and manmade),bush lands ,shrub lands, open wood land, exposed sand soil surface, urban land ,un cultivated land, and others (see table 3.1 below).

Number	Land use	Size (ha)	Percentages
1	Grazing land	292,028	52.62
2	Cultivated land	11,971	2.19
3	Forest Land	39,129	7.0
4	Dense bush land	147,000	26.49
5	Uncultivated land	62600	11.3
6	Others	2272	0.409
	Total	555,000	100

Source: Yabelo Woreda office of rural agriculture and pastoral development

2.1.4. Vegetation cover

The type of vegetation that are covering Yabelo Woreda are mostly characterized by sparse vegetation mainly composed of grasses ,natural forests like acacia tree and manmade forests like Acacia albida, Boswellia papyrifera,Casuarina equisetifolia,Commiphora Africana,Croton macrostachys,Delonix elata,Dovyalis abyssinica,Moringa oleifera,Olea Africana,Schinus molle,Sesbania sesban,and Juniperus procera.(Source:Yabelo district office of rural agriculture and pastoralist development)

2.1.5. Livestock population

The Yabelo Woreda pastoralists and agro-pastoralists are traditionally depend on cattle, goat and sheep for house hold food security and a few donkey, mule, camel, and chicken. Currently from the total livestock population, the largest number is taken by goat (222,779) and cattle (265,877). Sheep, camel, donkey, mule, and chicken accounts 97,011, 44,042, 6646, 833, and 92,470 respectively in 2013 (Source: Yabelo district office of rural agriculture and pastoralist development)

2.1.6. Farming system and livelihood strategy

It is known that agriculture is the back bone of Ethiopian economy and the rangelands are the major sources of livestock production. The Yabelo Woreda rangelands are dominant source of food and house hold income. According to the Yabelo Woreda office of rural agriculture and pastoralist development office there are 25 peasants associations (PAs). Out of the total population of the district about 68% deepened purely on pastoralism, 32% on agro-pastoralism for their livelihood .The cultivated and grazing land of the Woreda is estimated to be 11,971 ha (2.19%) and 292,028 ha(52.62%) respectively. Agro-pastoralism is a newly emerging phenomenon in the Yabelo rangelands.

2.1.7. Demographic characteristics

According to the 2013 population projection and house hold survey data the Yabelo Woreda has a total population of 98,730 of which 49,582(50.23%) are males and 49,148(49.78%) are females .The crude densities of the Woreda is about 0.18 persons/per hector .

2.2. Research Methodology

2.2.1. Research Design

The research approach that is planned to be utilized in this study is mixed research approach, which involves both qualitative and quantitative approaches to investigate a complex problem. This approach will be used because efforts will be made to have better insights and understanding about the impacts of rangeland degradation on the pastoral livelihood of the district. Thus, the combination of qualitative and quantitative techniques will help to conduct this study by cross checking the relevance and accuracy of the data or information that will be gathered through different tools and techniques. The trust worthiness of a study can be ensured if the findings of one method are sub stained by the other (Creswell et al; 2003 cited in Degefa, 2005).

2.2.2. Sample size and technique

A two stage sampling technique will be utilized to collect the primary data. Firstly, two villages Dikale and Dida Yabelo will be selected purposively out of 25 kebeles in the district. At this stage I will take very great care so that the selected kebeles will represent the district in terms of physical, socio-economic and organizational characteristics sufficiently. Secondly the sample household heads will be selected from each kebele using systematic sampling method. This will be carried out after the household in the sample villages is listed based on their village which will be obtained from district finance and economic development office. Accordingly, about 527 and 816 registered households in Dikale and Dida Yabelo villages are identified.

To determine the sample size of the households those to participate in the study the sampling formula which was developed by cochrm,to determine sample size(n) with a desired degree of

precision for general population will be used. In this case, population variable (p) is household units variable and is given as:

$n = NZ^2PQ/d^2 (N-1) + Z^2PQ$ where; n=sample size of house hold

P= housing units variable (rural household)

Q=Town household=1-p

N=total number of housing units

Z= Standardized normal variable and its value that corresponds to 95% confidence interval equals 1.96

d= allowable error

According to the data obtained from districts agriculture and pastoral development office (2014), there are about 98,730 household units; out of this 12,341 households (p) are town inhabitants.

Hence; $n= (98730) (1.96)^2(0.96) (0.04) / (0.05)^2(98730-) + (1.96)^2(0.04) =59$

Therefore n = 59 is the minimum sample size of housing units for reliable result.However,to be safe in case of non-cooperativeness of household ,unforeseen problems during data collection and other cases the sample size will be increased to 85 households.Then,the sample size will be taken from each village on the basis of household proportion . Accordingly 34(40%) respondents from Dikale and 51(60%) respondents from Dida Yabelo will be taken.

2.2.3. Types and sources of data

The study will require a wide variety of information that will help to answer major research questions .So, both primary and secondary data will be gathered for this research .The primary data which is planned to be utilize includes; structured and semi structured questionnaires, household survey, focus group discussion and key informant interviews. Secondary source of data such as reports of different years, books (published and unpublished), journal, internet, and research articles are planned to be utilize.

2.2.4. Procedures and tools of data collection

In the study both primary and secondary data are planned to use by employing quantitative and qualitative methods.

2.2.4.1. House hold survey

To collect the socio economic, organizational and institutional situations of users, on house hold assets and, demographic information from the sample household's structure interview questionnaire will be used. In conducting interview a few enumerators who have knowledge about the area ,culture and language will be recruited and train before the work of filling questionnaires .

2.2.4.2. Field observation

Degradation of rangelands and problems following it will be observed carefully at the field and photographs will be taken as additional tools for explanation of impacts.

2.2.4.3 Focus group discussion

This will be conducted with elder farmers who have been live for a long period of time, to gather information about historical records of rangeland resources.

2.2.4.4 Key informant interview

Interview schedule will be undertaken with elder persons, Kebeles officials, women's, youngsters, development agents, district officials pertain to rangeland resources and pastoral development and NGOs such as PCDP.

2.2.4.5. Secondary data

Secondary source of data will be gathered from zonal and district office, from the public and university libraries, offices of NGOs, CSA, and internet will be utilized.

2.2.5. Methods of data analysis

The data that is planned to be collected through different techniques will be analyzed by describing and narrating(qualitatively) and using descriptive statics (quantitatively).Therefore, qualitative data will be analyzed by using qualitative analysis techniques such as narrating in words. Quantitative data will be analyzed by using stastical data analysis techniques such as SPSS Package Soft Ware Program, descriptive statics like standard deviation, mean, coefficient of variations and other stastical tools will be used to analyze the numerical data.

3. Time and budget break down

3.1. Time budget break down

In order to accomplish the overall planned activities of the study the following tentative time schedule are listed (see table 4.1).

NO.	Activities	Months in which activities are implemented									
		S	O	N	D	J	F	M	A	M	Year
1	Problem identification	X									2014
2	Preliminary survey of review literature	x									2014
3	Review literature in detail			x	X	x	X				2014/15
4	Writing research proposal		x	x							2014
5	Submission of first draft proposal				X						2014
6	Final submission of proposal					x					2015
7	Developing research questionnaire				X						2014
8	Collecting data					x					2015

9	Data organization and analysis						X				2015
10	Thesis writing							x			2015
12	Submission of first draft thesis								x		2015
13	Submission of final draft thesis									x	2015

3.2. Budget break down

For purchasing necessary materials and implementation of different activities the following tentative budget can be break down (See table 4.2)

NO.	Materials /activities	Amount	Price in birr(single)	Total	Remark
1	Stationary(photo copy, printing, binding ,note book, secretary etc)	-	-	7000	
2	Compensation for key informants	-	-	5000	
3	Field assistants selected from study sites	10	100 per day for 4 days	4000	
4	Advisor	1	200for 8 days	1600	
5	For transportation during data collection	-	450birr per day for 20	9000	

			days		
6	For camera rent	1	150 for 8 days	1200	
7	For focus group discussion participant	-		3000	
8	Contingency(10%) of the total cost			3,378	
	Total			33,780	

Reference

Abule Ebro, (2005). The influence of woody plants and livestock grazing on grass species composition, yield and soil nutrients in the Middle Awash Valley of Ethiopia. Journal of Arid Environments 60, 343-358.

ACDI/VOCA, (2008). *Ethiopia Pastoralist Livelihoods Initiative Livestock Marketing (PLI-LM)* [Online].Retrieved on January 27, 2010from:http://www.acdivoca.org/acdivoca/PortalHub.nsf/ID/ethiopiaPLIAddis Ababa, Ethiopia.

Alemayehu, M., (2004). Rangelands Biodiversity: Concepts, Approaches, and the Way Forward. and Agro-pastoralist Areas of Ethiopia. ELTAP, Addis Ababa.

Ayana Angassa (2007). The Dynamics of Savanna Ecosystems and Management in Borena

BLPDP, (2004). Borana Low Land Pastoralist Development Program Documentation on Seven

.FAO (Food and Agriculture Organization) (2001). News & highlights: Forestry forum spotlights poverty alleviation. Rome, Italy.

Kideghesho J, Røskaft E and Kaltenborn B, (2007). Factors influencing conservation attitudes of local people in Western Serengeti, Tanzania. Biodiversity and Conservation, 16 (7): 2213-2230.

Nori *et al.* (2008). *Browsing on fences. Pastoral land rights, livelihoods and adaptation to climate change.* IIED issue paper no. 148.Norwegian University of Life Sciences (UMB).

Reed, M.S., Dougill, A.J., Baker, T.R., (2008). Participatory indicator development: What can ecologists and local communities learn from each other? Ecological Applications 18, 1253-1269.

Tefera, S, B. Dlamini, A. Dlamini, and V. Mlambo. (2007). Current range condition in relation to land management systems in semi-arid savannas of Swaziland. Afr J Ecol 46: 158–167.

UNDP (Unite Nation Development Program), (2008). Human Development Report,WWW.undp.org.

W/Giorgis, T, (2008). Local conflict-poverty-governance nexus: Case studies from Ethiopian

World Bank, 2008. World Development Report. World Bank, Washington, DC.