Rapid Appraisal of Resilience to the Effects of Recurrent Droughts in Borana Zone, Southern Ethiopia

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ABBREVIATIONS AND ACRONYMS

ASAL	Arid and semi-arid lowland
DFID	UK Department for International Development
FGD	Focus group discussion
GDP	Gross Domestic Product
GHA	Global Humanitarian Assistance
GTP	Growth and Transformation Plan
HABP	Household Asset Building Program
HDI	Human Development Index
HH	Household
HoA RILab	Horn of Africa Resilience Innovation Lab
HSEP	Health Services Extension Program
KII	Key informant interview
MoA	Ministry of Agriculture
MoFED	Ministry of Finance and Economic Development
MPI	Multidimensional Poverty Index
MT	Million tons
PSNP	Productive Safety Net Program
RAN	ResilientAfrica Network
SNNPR	Southern Nations, Nationalities, and People's Region
UNDP	United Nations Development Program
USAID	United States Agency for International Development

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SUMMARY

The rural communities of Ethiopia's Borana Zone are vulnerable to drought and its effects, including displacement, loss of livestock (for example, in the 2000 drought, 80% of livestock died) and food insecurity, sometimes followed by violent conflict. Pastoralists adopt a range of coping strategies to the loss of their livelihood from livestock, including selling or migrating their remaining animals, reducing household expenditure, resorting to paid labor, and relying on traditional social support. Some (especially young men) migrate to nearby towns or to Kenya for work and send money back to their families. Various stakeholders have implemented interventions to strengthen the pastoralist communities' resilience to drought. Such measures, focusing on pastoralist rehabilitation and livelihoods, nutrition, water and sanitation, HIV prevention and treatment, universal basic education, child development and natural resource management and education, have had varying successes.

OBJECTIVE

This study was conducted by the Horn of Africa Resilience Innovation Lab (HoA RILab), based in Ethiopia and hosted by Jimma University, as part of a ResilientAfrica Network (RAN) project to identify, develop and scale up innovative solutions to strengthen the resilience of African communities affected by natural and human-made shocks and stresses. The aim of the study was to assess the factors that affect the resilience of rural communities in Borana Zone to recurrent drought in order to develop resilience dimensions and metrics and identify possible innovations and interventions to improve resilience.

METHODS

A rapid qualitative assessment was conducted in Arero and Dhas districts of Borana Zone, Ethiopia, in August 2013. A grounded theory approach was used to guide the development of a theory of change and for understanding of resilience dimensions. The data were collected from men and women, community/informal leaders and others at various levels through focus group discussions (FGDs) and key informant interviews (KIIs). In each district, two pastoralist communities (*kebeles*) were selected for study. Additionally, 36 KIIs were conducted with representatives of institutions and organizations involved in resilience programming from community to national levels. Research teams comprising faculty members with masters' degrees and postgraduate students from Jimma University collected the data and supervised the process. Transcription and translation were done verbatim. ATLAS.ti7.1 was used for data management and analysis. The data analysis involved three steps: Identification of initial codes, followed by formation of code families/categories as an initial stage of developing resilience dimensions and finally, formulation, revision and refinement of the dimensions of resilience.

RESULTS

Ten resilience dimensions were derived from the analysis of a dataset of 12 FGDs and 36 KIIs to identify entry points for innovative interventions. Eight resilience dimensions emerged from a systematic process of clustering related codes or sub-dimensions at various levels and subsequent discussion. These include 1) *Wealth*, 2) *Livelihood*, 3)*Social Capital/Community Networks*, 4)*Psychosocial Wellbeing*, 5)*Infrastructure/Social Services*, 6) *Environment*, 7) *Human Capital* and 8)*Governance/Peace/Security*. RAN's Dimension Lexicon was used to define the dimensions of resilience. There is considerable RILab and country/context-specific variation. The HoA RILab harmonized the dimension definitions in the context of its theme of recurrent droughts. Each dimension was defined and described in terms of its adaptive strategies, coping strategies, vulnerability factors and causes and effects.

A context-specific analytical resilience framework was then developed for recurrent droughts. The framework helped conceptualize the linkages (cause and effect chain) among dimensions. Climate change, aridity, land degradation, deforestation, water scarcity, invasive plants and overgrazing were the root causes of recurrent droughts in the two districts of Borana Zone, identifying *Environment* as a dimension of vulnerability. The dimensions of *Livestock*, *Wealth* and *Infrastructure/Social Services* were related to the immediate effects of recurrent droughts. The *Wealth* and *Livestock* dimensions were also interrelated, as livestock production is the predominant livelihood and source of wealth among the Borana pastoralists. *Psychosocial Wellbeing* and *Human Capital* were related to stress, depression and anxiety resulting from loss of livestock and wealth due to recurrent droughts, displacement, conflict, insecurity and instability. The *Social Capital/Community Networks* dimension was related to adaptive and coping mechanisms such as traditional asset redistribution and restocking. *Governance/Peace/Security* was a supportive/enabling factor for the resilience of the Borana pastoralist communities to recurrent droughts, conceptually related to *Infrastructure/Social Services*, which affect *Livestock* and *Wealth*.

The context-specific analytic framework was then used to identify the best dimensions for interventions that would have a positive impact on overall resilience. *Infrastructure/Social Services* and *Social Capital/Community Networks* were the two most important entry points for interventions to strengthen resilience to recurrent droughts in the study area. *Infrastructure/Social Services* most affected and was most affected by the other dimensions. *Social Capital/Community Networks* supported or enabled the *Infrastructure/Social Services*, *Livestock* and *Wealth* dimensions. Endogenous knowledge of forecasting drought (e.g., using wind direction) contributed to community preparedness. The major vulnerability factors in relation to *Infrastructure/Social Services* were lack of access to water, education, markets,

rehabilitation centers, responsive human and veterinary health services, timely information, fodder and other resources. Poor psychosocial conditions led to a high prevalence of crime and unhealthy behaviors such as chewing khat and drinking alcohol.

These findings indicated the following potential entry points for designing, incubating, testing and scaling up innovations to help the communities in Borana Zone adapt to the effects of recurrent drought:

- School construction
- Provision of timely information on disaster preparedness and weather conditions
- Responsive veterinary and human health services
- Water source development and management
- Rehabilitation centers
- Family planning
- Capacity building for district health leadership and management
- Innovations to save traditional social and legal support systems from further deterioration to maximize their contribution to local development
- Evidence-based policy dialogue to promote community engagement.
- Psychosocial health care integrated into the rural Health Services Extension Program (HSEP) packages
- Culturally appropriate social and behavior change (SBCC) materials to discourage negative coping behaviors and cultural beliefs

CHAPTER ONE: INTRODUCTION

Over the past few decades, the burden of natural and other disasters has increased (OXFAM, 2011). Natural disasters are the results of natural and unpredicted variability in the environment, and technological disasters are the result of human activity. Hybrid disasters have a mix of natural and technological causes. (Sphere Project, 2010) Human factors increasingly underlie most disaster situations, contributing to either the cause or the effects of the disasters.

Disasters often entail sudden shocks that disrupt the livelihoods of communities, infrastructure and institutions (UNDP Ethiopia, 2011). Even without sudden shocks, communities affected by drought face slow-onset and persistent stress that affects their wellbeing. Climate change is one of the causes of such stress and takes a significant toll on the economic production and resilience of communities (USAID, 2013).

The global approach to adverse events, shocks and stresses originally focused on response. As it has become clear that risk reduction should be a higher priority, there has been an increasing focus on prevention, mitigation and preparedness (Frankenberger et al., 2012). However, despite the best efforts of donors, governments, and civil society to mitigate and prevent disasters, the frequency and scale of adverse events, shocks and stresses is increasing (MoA, 2013). Risk reduction programs should therefore include a strong component of resilience building to help communities overcome their vulnerability and cope with shocks and stresses (Frankenberger et al., 2012).

The Resilient Africa Network (RAN) is one of eight university-based Development Labs making up the Higher Education Solutions Network (HESN) established by USAID. In Africa, RAN brings together 20 universities in 16 countries, with a secretariat at Makerere University in Uganda. RAN is structured around four Resilience Innovation Labs (RILabs). The Horn of Africa RILab (HoA RILab) is based in Ethiopia and hosted by Jimma University. By applying science, technology, innovation and partnerships and using evidence-based approaches, RAN seeks to identify, develop and scale up innovative solutions to strengthen the resilience of African communities afflicted by natural and human-made shocks and stresses.

1.1. Challenges to Resilience in Borana Zone, Ethiopia

Drought has frequently triggered catastrophic human losses from famine in Ethiopia. There have been internal displacements since the 13thcentury as a result of recurrent famine and disease epidemics (Pankhurst, 1998);(MoA, 2013). Deforestation, poor management of land and water, depletion of key ecosystems and loss of biodiversity have contributed to climate change, food insecurity and conflicts in Ethiopia (USAID, 2013). Population growth, loss of prime grazing

lands and an influx of refugees further threaten the way of life and survival of Ethiopian pastoralists (Abdulahi, 2005). Recurrent drought affects the pastoralist communities of Arero and Dhas districts of Borana Zone.

Southern Ethiopia, where Borana Zone is located, experienced severe droughts in 2000 (Angasse A. & Oba G., 2007), 2006, 2008 and 2010–2011 (USAID, 2011). During the drought of 2000, 80% of livestock died (Angasse A. & Oba G., 2007). Droughts now occur in the zone every 1–2 years, compared to every 6–8 years in the past (Riché et al, 2009). Table 1 lists drought-related events the zone in the past 50 years.

Table 1: Drought-related events in Borana Zone, 1961–2011

Period	Location	Main events
1961–1969	Jaldesa Liben	• Conflict between Somali (Guji) and Borana pastoralists and displacement of some communities • Rinderpest (cattle disease) outbreak
1969–1977	Goba Bule	• Excavation of large ponds • Construction of a tarmac road, which improved market access and crop cultivation • First restocking and large livestock programs
1977–1985	Jilo Aga	• Severe drought and conflict between Borana and Somali • Increase in wildlife hunting • Southern Rangelands Development Unit (SORDU) sub-project of the Third Livestock Development Project funded by the African Development Fund and World Bank • Expansion of *kebele*-based "communal enclosures," replacing *seera yabbii**
1985–1993	Bora Guyo	• Drought, conflict and disease (human and livestock) • Support from nongovernmental organizations (NGOs) to establish fenced *kallos*** Weakening of customary institutions as *kebele* leaders gained authority
1993–2001	Boru Meda	• Partial drought, major Borana-Somali conflict over land • Massive deforestation from fire • Expansion of cropland and large ponds • Increasing bush encroachment to clear land • Stronger links between government and traditional leadership

Period	Location	Main events
2001–2009	Liben Jeldesa	• Drought; start of feed purchasing for livestock as a drought response. This increases the market value of grazing land • As a result of elections, transfer of almost one-quarter of Borana rangeland from Oromia to Somali region and the Guji clan; shrinkage of Borana rangelands and loss of pasture and water resources leading to conflict in regional border areas • Huge expansion of privately and semi-privately owned, fenced *kallos* and cooperative and government *kallos*
2009–2011	Guyo Goba	• Severe drought and conflict • Continued expansion of cropland • Increased value of enclosed lands from increased feed purchasing • Dismantling of informal/unofficial settlements and definition of settlement and grazing areas (community *kallos* and open common grazing lands) in government land use • Dismantling of some private enclosures

Source: Napier, A. and Desta, S. (2011). Review of pastoral rangeland enclosures in Ethiopia. Boston, MA: Feinstein International Center, Tufts University.

*Traditional enclosures (literally "protected grazing for calves") of around 10 hectares or less that are meant to conserve pasture or put aside a section of rangeland for milking cows, calves, and sick animals during the dry season or times of drought.

**Larger, fenced semi-private or communal enclosures that have mostly replaced the *seera yabii*.

The rainfall pattern is highly erratic in the area (FDRE, 1989). In addition to drought, the pastoralists face pests and poor access to improved crop and livestock varieties and markets (Lasage, A. et al, 2010). They are also vulnerable to loss of livestock and the need to migrate with their animals to regions less affected by drought (Borana Zonal Administration, 2013);(Lasage, A. et al, 2010). Human diseases such as malaria and animal diseases such as trypanosomiasis, pasteurolosis, blackleg and anthrax are also important challenges to the livestock-based livelihood of the communities (Lasage, A. et al, 2010).

In large areas of Borana Zone, overexploitation has led to falling groundwater levels and dry wells. Land degradation and deforestation decrease agricultural productivity through soil deterioration and erosion. Bush encroachment is another problem on pasturelands used for cattle (Lasage, A. et al, 2010) . There have been conflicts over declining grazing land as a result of climate change and environmental degradation (Borana Zonal Administration, 2013). Arero and Dhas are among the most vulnerable of the 13 districts of Borana Zone to the impacts of

drought. There have been four episodes of conflict in Arero, Dhas, and Moyale districts since 2000 (Odhiambo, 2012), two of them in Dhas in 2001 and 2004.The frequency of these conflicts is assumed to be directly related to vulnerability to drought and related shocks.

1.2. Background of the Rapid Assessment

RAN held a consultative partners' meeting in April 2013inKampala, Uganda, involving representatives from the four RILabs. In this meeting, the RILabs prioritized thematic areas for their regional resilience programming and proposed geographical focus areas for targeted interventions. For each geographical area, the teams made a preliminary list of vulnerability factors and adaptive capacities, as well as possible ways in which RAN can contribute to mitigating the vulnerability factors. The next step in RAN's strategy is to develop and validate a framework for understanding, measuring and monitoring resilience in vulnerable communities in sub-Saharan Africa and translating resilience challenges into an innovations agenda. This required a thorough understanding of the dimensions of resilience in the geographical areas of focus, including Ethiopia.

CHAPTER TWO: BORANA ZONE, ETHIOPIA

As of 2013, Ethiopia's Human Development Index (HDI) value for 2012 was 0.396, positioning the country 173rdout of 187 countries and territories (Human Development Report, 2013). A2011 survey to estimate the country's Multidimensional Poverty Index (MPI) found that 87.3% of the population lived in multidimensional poverty (the MPI "head count"), while an additional 6.8% were vulnerable to multiple deprivations (Ibid).

The Government of Ethiopia has implemented a series of poverty-focused development strategies, including a Sustainable Development and Poverty Reduction Program (SDPRP) launched in 2001,the Plan for Accelerated and Sustained Development to End Poverty (PASDEP) (2005/2006–2009/2010) and the Growth and Transformation Plan (GTP) (2010/2011–2014/2015)(African Development Bank et al., 2012) These strategies have been supported by a market-oriented economy since 1991 (National Bank of Ethiopia (NBE, 2010). As a result, the country has demonstrated one of the fastest growing economies in the world, despite a largely agrarian population. About 85% of the population earns a livelihood from agricultural production.[1] Between 2005–2006 and 2009–2010, the economy experienced an annual average growth of 11%, whereas agriculture had an annual average growth rate of 8.4%, industry 10% and services 14.6%(MoFED, 2010). Agriculture meets 95% of the food demand in the country, with the remainder obtained from imports or food aid (Ibid).

Ethiopia's population has increased steadily over the past 3 decades, from 42.6 million in 1984 to 53.5 million in 1994, 73.8 million in 2007, and 87.0 million in 2013(Population Council, Ethiopia, 2013). There were slight declines in population growth over these periods, from 3.1% per annum in 1984 to 2.9% in 1994 and 2.6% in 2007.(CSA & ORC Macro, 2011). The country has a sex ratio of 95 males per 100 females (CSA & ORC Macro, 2011). The main occupation of the settled rural population is farming, while the lowland areas are mostly inhabited by a pastoral people who depend on livestock production and move from place to place in search of grass and water (Ibid).

Drought has frequently triggered famine in Ethiopia, with catastrophic human losses. Famine and disease have caused internal displacement in the country since the 13thcentury (Pankhurst, 1998). Southern Ethiopia, where Borana Zone is located, experienced severe drought in 2006, 2008, and 2010–2011 (USAID, 2011). Drought in the Horn of Africa is the result of climate change, causing the worst food crisis of the 21st century. Deforestation, poor management of land and water, depletion of key ecosystems and loss of biodiversity have contributed to climate change, food insecurity and conflict in Ethiopia (USAID, 2013).

[1] See http://www.fao.org/ag/ AGP/AGPC/doc/Counprof/Ethiopia/Ethiopia.htm

2.1. The Pastoralist Economy

Ethiopia has an estimated 10 million pastoralists and agro-pastoralists, who make up about 12% of the total population. These groups herd their livestock in the arid and semi-arid lowlands that are prone to rainfall variability, extreme drought and flash floods (MoA, 2013).

The pastoralist communities of Ethiopia own22%of the cattle (10.36 million head), 40.7% of the sheep (13.6 million head), 60% of the goats (18 million head) and 100% of the camels (2.5million head).Although not highly commercialized, pastoral and/or lowland areas contribute to domestic and international trade and are not only used for subsistence livelihoods. Pastoralists have a higher level of off-take from their herds than sedentary farmers in the highlands of Ethiopia and consequently provide the majority of animals for both the domestic and export markets (MoA, 2013).Export trade in live animals sourced mainly from pastoral areas rose from USD 27.3 million in 2005–2006 to USD 147.9 million in 2010–2011. Exports of chilled meat increased during the same period from 7,717 metric tons (MT) (@ USD 15.60) to 16,877MT (Cullis & Catley, 2012). The livestock sector, which is largely concentrated in arid and semi-arid lowland (ASAL) regions, contributes 12–16% of Ethiopia's gross domestic product (GDP) and 30–35% of the agricultural GDP (MoA, 2013).

Further threats to the way of life and survival of Ethiopian pastoralists include population growth, loss of prime grazing lands, displacement and an influx of refugees. Constriction and degradation of habitat, loss of complementary economic activity and lack of supplementary income sources have critically affected their economy and fuelled pastoral conflicts (Abdulahi, 2005).

2.2. Borana Zone

Borana is one of 18 administrative zones in Oromia Regional State. The zone is situated between 3°36–6°38'North latitude and 3°43'–39°30' East longitude in the southern part of Ethiopia and the state. It borders Kenya in the south, Somali Regional State and Guji Zone in the east, and the Southern Nations, Nationalities, and Peoples Region (SNNPR) in the north and west. Yabello, the capital of Borana Zone, is 570 km south of Addis Ababa. The zone has 13 districts (*woredas*): Abaya, Arero, Bule Hora, Dhas, Dillo, Dirre, Duda Dawa, Gelana, Megala, Miyo, Moyale, Teltele, and Yabelo. The land area is63,939km^2, of which 107,288.26 hectares are arable land, 342,036 hectares are grazing land, 342,036 hectares are forested and 1,443,220.51 hectares are covered by water bodies, towns, and bushes(Borana Zonal Administration, 2013).

Ecologically, 10% of the total area is classified as cold highlands (*dega*), 20% as mid-highlands (*woina-dega*) and 70% as semi-arid lowlands (*qolla*). All ecological areas are frequently exposed to rainfall variability and drought. The altitude of the zone ranges between 1,000m and 1,500m above sea level. The semi-arid lowlands are predominantly flat, covered with bushes and shrubs (Borana Zonal Administration, 2013). There are two rainy seasons of different duration. The main rainy season (*genna*) is from mid-March to May, and the short rainy season (*hageya*) from September to mid-November.

The projected population of Borana Zone in 2013 was 1,113,538, with the majority (91%) living in rural areas (Ibid.). In 2010, the child mortality rate was 142 per 1,000 live births, and the school enrolment rate was the lowest in the country (Lasage et al., 2010).

The most important sources of livelihood in the zone are farming and animal rearing. The population in the high rainfall areas of the highlands practices both farming and animal husbandry, while people in the semi-arid lowlands have a pastoral lifestyle, usually moving from place to place in search of water and pasture for their livestock during the dry seasons (Borana Zonal Administration, 2013);(Lasage et al., 2010).Borana Zone hosts a relatively large population of pastoralists, who comprise the Sabbo and Goona sub-groups of the Oromo (Mohammed A., 2005).

2.2.1. Community and Livestock Mobility

Moving livestock is the main strategy used by the pastoral community of Borana for risk management and efficient and communal utilization of range resources. This takes two forms. The first is regular mobility (*godaanssa fooraa*), moving livestock from permanent settlements to neighboring communities in search of pasture and water. Villagers send a team of scouts (*aburu*), often men, to identify locations with available pasture and water, the carrying capacity of the rangeland, the willingness of the host community to share resources and the prevalence of livestock diseases in the area. The second form of mobility (*godaanssa warraguda*) is moving the family and whole herds to permanent water sources during times of acute drought or conflicts. During this type of movement, both people and herds use the same water sources(Lasage, A. et al, 2010).

2.2.2. Vulnerability to Recurrent Droughts

The lowland parts of the zone are severely affected by recurrent drought. The rainfall pattern is highly erratic in the area, sometimes above normal and sometimes far below normal in intensity (Frankenberger T. et al, 2012). The semi-arid savannah landscape of the zone is marked by gently sloping lowlands and flood plains (Lasage et al., 2010) Pastoralists in the zone face drought, pests, diseases, lack of access to improved crops and livestock varieties, and poor

market access (Ibid). The Borana Zonal Administration Office emphasized that pastoralists in the zone are vulnerable to shortage of food, loss of livestock, and the need to move to less affected regions of the zone and beyond (Borana Zonal Administration, 2013).

The Ministry of Agriculture (MoA) Regional Pastoral Livelihoods Resilience Project (RPLRP) has reported frequent disasters including drought, floods, and livestock diseases (MoA, 2013). A survey conducted in Borana communities in 2009 found that drought occurred in the zone every 1–2 years, compared to every 6–8 years in the past, evidence that the area is vulnerable to stresses related to climate changes (Riché et al., 2009).

Pastoralists in Borana Zone do not have sufficient access to clean drinking water, as there are no perennial rivers (the ephemeral drainage system is located within the Genale-Dawa River basin) and rainfall is highly variable. They depend largely on open water sources often contaminated with human or animal waste and in some places agricultural runoff. Providing water for pastoralists is difficult because of the low population density, the tradition of mobility, harsh environment and the risk of increasing the livestock population above the (variable) carrying capacity of rangeland by digging new boreholes, cisterns or traditional ponds (*burka*) (Lasage et al., 2010)

Overexploitation of natural resources is one of the main causes of drought, in turn driven by poverty, rapid population growth, increasing numbers of livestock, dependency on natural resources for livelihoods and poor land use. In large areas of Borana Zone, overexploitation of water has led to dropping groundwater levels and dry wells. Land degradation and deforestation result in loss of agricultural productivity through soil deterioration and erosion. Bush encroachment is another problem for the pasturelands used for cattle (Lasage et al., 2010)

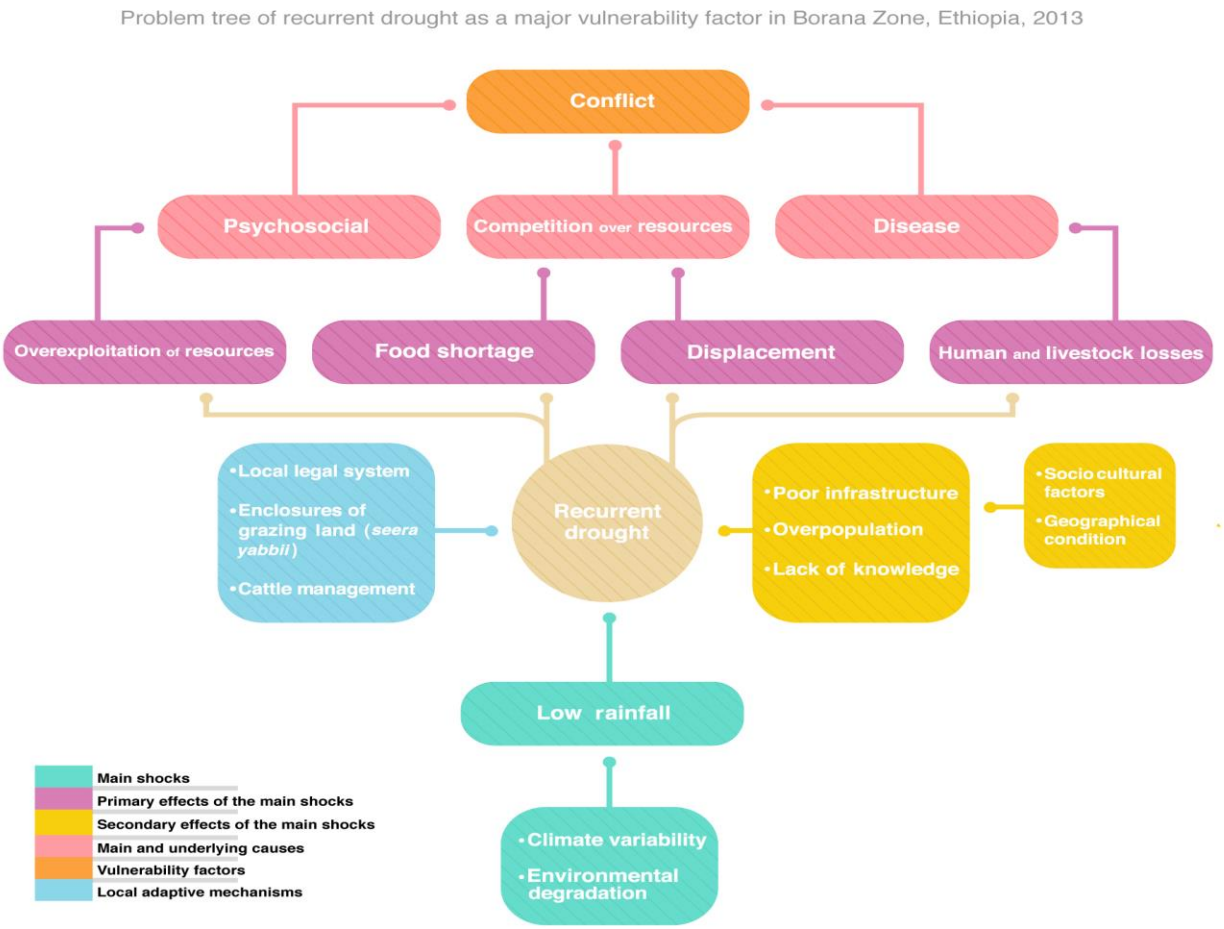
2.2.3. Drought Trends and Effects

The rural people of Borana Zone are very vulnerable to drought. During the drought of 2000, 80% of livestock died. In 2008 a relief program had to supply water and fodder to communities (Angasse A. & Oba G., 2007). Malnutrition is widespread in the zone as a result of poor access to clean water, low agricultural production, lack of infrastructure and poverty in general(Lasage, A. et al, 2010). Climate change and environmental degradation have given rise to conflicts over declining grazing land. In the pastoralist and some agro-pastoral areas of the zone, human diseases such as malaria and animal diseases such as trypanosomiasis, pasteurolosis, blackleg and anthrax challenge the livelihoods of the communities (Borana Zonal Administration, 2013).

Factors that affect vulnerability to recurrent drought in the zone include lack of infrastructure such as water supply, markets and early warning systems, overexploitation of natural resources (overgrazing and deforestation), weak livelihood diversification, low livestock productivity and

poor natural resource management. The underlying causes of vulnerability include the cultural value placed on owning large number of animals, scattered settlements that limit access to basic services, soil aridity and poverty. Pastoral households sell animals during drought to buy staple cereals, but there are few buyers and prices fall substantially because everyone is selling. The low value of the animals makes sellers lose key capital assets. Moreover, many animals die from starvation. Poorer households with smaller herd sizes are most vulnerable to these effects, which are a common reason for the descent into poverty (Cabot Venton et al., 2012). Figure 1 summarizes the causes, drivers and effects of recurrent drought as a major vulnerability factor.

Figure 1: Problem Tree of Recurrent Drought as a Major Vulnerability Factor in Borana Zone, 2013



2.2.4. Drought Resilience of Pastoralists

The Government of Ethiopia has implemented several resilience efforts in response to shocks faced by vulnerable communities, including the pastoral communities of Borana, under the overall guidance of a long-term strategy for agricultural development-led industrialization and a national food security program that includes productive safety nets, voluntary resettlement, household asset-building and other interventions (UNDP, 2011). An example of the government's resilience efforts is the establishment of the Ethiopian Commodity Exchange (ECX) for farming cooperatives, domestic traders, agro-industrial processors, commodity exporters and institutional buyers. An estimated 850,000 smallholder farmers (mostly producers of coffee, sesame and other cash crops), around 12% of the national total, are involved in the exchange system (UNDP, 2011).

The Borana people, whose economies have suffered from repeated droughts, have begun adopting an agro-pastoral lifestyle to diversify their sources of livelihood (Borana Zonal Administration, 2013). They also grow crops (e.g., maize, legumes and teff) for economic diversification and food and fodder self-sufficiency (Coppock, 1994). The pastoralists traditionally cluster permanent encampments near deep-water wells. They use herd stratification to tune selective feeding behavior and tracking potential of different cattle categories to the available grazing and water capacity. During the rainy season, they split off satellite herds consisting of non-lactating cattle to move to temporary camps in distant pastures. During dry seasons, the lack of surface water forces the herds back to the pastures around the wells. This land use pattern produces highly variable stocking densities across the landscape, maintaining high pasture productivity and sustaining the herds' rapid recovery from scarce grazing during dry seasons. Strategic negotiations and flexible institutional networks facilitate the herd movements (Sabin et al., 2005).

Appointed water managers supervise the complex clan arrangements for access to water. Across clans, special committees of elders coordinate each well with the use of the adjacent pasture, and other committees coordinate the access of cattle to the shared seasonal grazing areas. Decisions on large-scale movements are based on the guidance of experienced range scouts with the agreement of knowledgeable elders (Sabin et al., 2005).

2.2.5. Strategies to Cope with Recurrent Droughts

The pastoralists have adopted a range of strategies to cope with loss of livestock, including sale of animals, livestock migration, reduction of household expenditure, paid labor and traditional social support(Borana Zonal Administration, 2013). The lower class and very poor households generate income by harvesting *Juniperous* trees to make charcoal or firewood or to sell in nearby towns for construction. Others, especially young men, migrate to nearby towns or to Kenya to

work and send back money to their families. A few young men are involved in salt and gold mining using traditional methods to generate income (Helland, 2000).

In situations of serious food shortage, the Borana eat only one meal (lunch) a day. Adults may go hungry to feed children. Households that own a good number of animals may sell some of them when market prices are high and when they anticipate drought. They save the money they earn in bank to buy grain when it is cheaper. Some invest money in building houses in nearby towns to generate income from rent. Other coping strategies are cutting the leaves of evergreen trees and shrubs to feed their animals, slaughtering emaciated animals to sell for low prices and eating wild plants such as *gunbo*, *buri* and *ostria* to survive (Helland, 2000). Some people have installed privately owned cisterns and used them to sell water during droughts (Kebebew et al., 2001).

The Borana also enclose rangeland to overcome some effects of drought. Traditional pastoralist enclosures, called *seera yabbii* (protected grazing for calves), cover 10 hectares or less and are used to conserve pasture or set aside a section of rangeland for milking cows, calves and sick animals during the dry season.

2.3. Key Actors Involved in the Response to Drought in Borana Zone

The Government of Ethiopia (MoA, 2013)has implemented the following program and strategy intiatives in response to the displacement of pastoralist communities by drought:

1. *Development Plans (2010–2014) of Regions:* Regions including Oromia with large pastoral and agro-pastoral populations planned strategies to improve food security and enhance resilience through a) natural resource management (development of water, animal health services, infrastructure and basic services) and b) irrigation development with an emphasis on voluntary resettlement of pastoralists along major river basins, forage and crop production, creating market linkages and value chains.

2. *Millennium Development Goal Project (2002–2006):* In Ethiopia, this UN-commissioned project aimed to promote development and management of untapped water resources to achieve higher sustainable production that would raise income and living standards in watershed areas without causing any deterioration in the resource base and ecological equilibrium. The goal was to help meet the Millennium Development Goal of reducing poverty by half in 2015 and reach the GTP targets.

3. *Drought Resilience and Sustainable Livelihood Programme:* This African Development Bank-financed regional investment operation began in 2013 under the twelfth replenishment

of the African Development Fund (ADF 12) to address drought in the Horn of Africa. The first phase covered 15 *woredas* from two regions in Ethiopia (not including Oromia).

4. *Strengthening National Capacities for Conflict Prevention and Peace Building (2010–2013):* With support from the United Nations Development Program (UNDP), the Ministry of Federal Affairs implemented activities for peace building and conflict resolution, including early warning and response, promotion of a culture of peace and education and community policing.

5. *Pastoral Community Development Project (PCDP-II) (2003–2018):* This World Bank-assisted project focuses on sustainable livelihoods through community-driven development, risk management that includes drought contingency planning, effective public service delivery, livelihood diversification and investment in disaster management. It operates in 55 *woredas* in the ASAL regions of Somali, Afar, Oromiya and SNNPR. Livelihood interventions mainly focus on women and diversification through micro-finance institutions (MFI).

6. *Productive Safety Net Program (PSNP) (2005–2008) and Complementary Community Investment Program (CCIP) (2010–2014):*The Government of Ethiopia's PSNP aimed to ensure food consumption and prevent asset depletion for rural food-insecure households in a way that stimulated markets, improved access to services and natural resources and rehabilitated and enhanced the natural environment ((Food Security Coordination Directorate (FSCD), 2007).Implemented with the support of nine development partners, the program provided multi-annual transfers of food, cash or both to help food-insecure people survive food deficit periods and access to essential social services. It was piloted in 32 chronically food-insecure *woredas* in pastoral areas. PSNP Plus (2009–2012) aimed to graduate households from PSNP through market-driven approaches to diversify their livelihoods, build assets and link to markets and financial services. As part of the government's Food Security Programme, the Complementary Community Investment Programme (CCIP) provided access to basic services and infrastructure.

7. *Agricultural Growth Program/Livestock Growth Project (AGP–LGP) (2013–2018):* This investment plan by USAID-Ethiopia under the U.S. Government's Feed the Future initiative aims to foster growth and reduce poverty by improving the competitiveness of selected livestock value chains in 83 *woredas* (including Oromia) to benefit smallholders and pastoralists.

8. *Pastoral Livelihoods Initiative (PLI) (2005–2012).* This project, implemented through collaboration among the Government of Ethiopia, nongovernmental organizations (NGOs), the private sector and universities, aimed to strengthen livestock-based livelihoods of pastoralists vulnerable to climatic conditions and lack of access to markets.

2.4. Effectiveness of Government Strategies

In 2011, the Inter-Agency Standing Committee (IASC, 2011)and UK Department for International Development (DFID, 2011) identified the following core principles to guide resilience programming:

- Support a change, over time, in the balance of effort and resources from humanitarian assistance toward disaster risk management (DRM), climate change adaptation (CCA), livelihood support, and social protection (SP).
- Recognize and respond to the different needs, capabilities and aspirations of different people, especially the most vulnerable groups (women, children, orphans, elderly, displaced).
- Build the capacity of formal and informal institutions for equitable natural resource management, conflict mitigation and social protection.
- Advocate for and promote improved governance among government institutions and civil society by supporting responsive policies, transparent resource allocation and greater accountability.
- Inform coherent policy formulation and program design that responds to ongoing change in environmental, social and economic conditions.
- Enable community participation by identifying and engaging customary institutions and valuable forms of traditional knowledge for coping with climate variability.
- Promote empowerment of women by creating greater opportunity for their involvement in key institutions and decision-making processes.
- Be owned at the country level by linking with national policies and investment plans consistent with the CAADP and the Hyogo Framework for Action.
- Build effective partnerships, drawing on the comparative advantages of a wide range of stakeholders.
- Do no harm: Ensure that neither humanitarian responses nor development initiatives undermine the ability of vulnerable populations to achieve livelihood security over the long term.

In light of these principles, the literature has examined lessons learned and challenges faced in implementing resilience programs in Ethiopia. A review of the Global Humanitarian Assistance (GHA)Report 2012recognized the effectiveness of Ethiopia's PSNP(Porter, 2012). The program mobilized labor for building public infrastructure such as roads and irrigation systems and soil and water conservation to increase agricultural productivity and access to markets. Payment was in the form of either cash or food. Instead of simply addressing the symptoms of food insecurity, the PSNP helped people graduate out of chronic food insecurity. Between 2005 and 2008, 8 million people were able to eat more food of better quality more often, protect their assets and avoid premature harvesting of crops.

The PSNP introduced a risk financing mechanism (RFM) that comprised an early warning system, contingency finance, contingency planning and capacity development components, which improved the PSNP's capacity to address humanitarian emergencies. The GHA Report 2012noted that the PSNP RFM had comparative advantages over traditional humanitarian responses to food insecurity and responded to the 2011 crisis more cost-effectively than the UN and NGOs by reducing the reaction time between crisis identification and response from 8 months to 2 months. It was therefore suggested to scale up the lessons learned under PSNP-Plus through the government-supported Household Asset Building Program (HABP), which extended credit to food-insecure households (Frankenberger et al., 2012).

The second phase of the PLI incorporated a "crisis modifier" approach (including interventions such as destocking livestock) to improve provision of food and water to people and animals during droughts. Commercial destocking was an effective way to support pastoralist livelihoods facing drought in a wider context of a dynamic livestock export trade (Cullis & Catley, 2012).

2.5. Challenges to Resilience Building in Ethiopia

Despite the positive results of the PSNP, Ethiopia is still vulnerable to drought and volatile food prices. Preventing rising food prices in the face of famine can scare off farmers and traders. The focus of the PSNP needs to change from food-insecure areas to dealing with severe shocks. There is still a need for prompt, fully funded and effective emergency relief (Porter, 2012).

Poor infrastructure, limited connectivity, weak institutional and human capacities, inadequate expertise, logistical shortfalls and management-related problem are bottlenecks to the country's resilience building efforts. Occasional violent inter-clan and other conflicts over scarce resources in the border areas are additional challenges (MoA, 2013).

2.6. Resilience Efforts of USAID and Other Organizations

The Horn of Africa is often said to be home to some of Africa's poorest people. Inhabited by the world's largest remaining concentration of pastoralists, the region is highly food insecure because of climate variability and historical civil and communal wars. Various international organizations have made efforts to increase the resilience of local communities to drought.

One such organization is the International Food Policy Research Institute (IFPRI), established in 1975 to identify and analyze alternative national and international strategies and policies. IFPRI works to meet the food needs of the developing world, especially low-income countries and poorer groups such as pastoralist communities. Another is the U.S. Agency for International Development (USAID). USAID works in over 100 countries to promote economic prosperity; strengthen democracy and good governance; improve global health, food security, environmental sustainability and education; help societies prevent and recover from conflicts; and provide

humanitarian assistance in the wake of natural and man-made disasters.(Heady & Kennedy, 2011). During the worst drought ever to occur in Ethiopia, in2011, USAID hosted a workshop on "Enhancing Resilience in the Horn of Africa: An Evidence Based Workshop on Strategies for Success" in Washington DC.USAID emphasized the need to strengthen resilience and coping mechanisms in the ASAL regions of Djibouti, Ethiopia, Kenya and Somalia, which are geographically, linguistically and economically distinct from the highland areas of these countries. To build the resilience of food- insecure communities in Ethiopia, USAID supported the PSNP in shifting from emergency relief to addressing the underlying causes of household food insecurity. The PSNP also aimed to strengthen soil and water conservation to make agriculture more productive and sustainable. This program believed to reduce the food aid beneficiaries from 14.6 in million to 4.6 million in 2002–2003(USAID, 2012).

USAID funds for Pastoralist Livelihoods Initiative-Livestock Marketing (PLI-LM) project (2005–2010) in Ethiopia through Agricultural Cooperative Development International/Volunteers in Overseas Cooperative Assistance (ACDI/VOCA) to reduce poverty, hunger and vulnerability to drought and related shocks. The project strengthened the commercial orientation and capacity of pastoralist communities to respond to market demand and built infrastructure needed to enable market players to conduct efficient and fair trade (ACDI/VOCA, 2013).

As a new approach, USAID established a Horn of Africa Joint Planning Cell (JPC) in 2012 to build the resilience of chronically vulnerable populations by comprehensively addressing the root causes of vulnerability and facilitating economic growth. The JPC seeks to layer, integrate and sequence existing humanitarian and development assistance to support resilience building based on an analysis of chronic vulnerability, USAID's comparative advantage and the enabling environment. In 2013,USAID's Resilience Secretariat produced a position paper on measuring resilience in the Horn of Africa and the Sahel (USAID, 2013).

Local organizations in Ethiopia, including the Relief Society of Tigray (REST), Nyala Insurance Share Company and Debit Credit and Savings Institution collaborated with Oxfam America, the International Research Institute for Climate and Society (IRI), the Rockefeller Foundation, Swiss Re and other organizations in an innovative climate change resiliency project called Horn of Africa Risk Transfer for Adaptation (HARITA)(HARITA, 2009). HARITA broke new ground in the field of climate change resiliency and micro-insurance by addressing the needs of smallholder producers through an unusual mix of risk reduction, drought insurance and credit.

Another new approach to increasing resiliency is the strategy made to share up-to-date data (GFDRR, 2013). This aimed to build resilience to disasters in a changing climate, policy-makers and the public must have access to accurate and up to date information. The Open Data for

Resilience Initiative (Open DRI) is a global partnership that seeks to build data sharing programs along with the capacity and tools to use data to make informed decisions. The World Bank and Global Facility for Disaster Reduction and Recovery (GFDRR) developed the Horn of Africa Mapping Project, an Open DRI initiative that aims to share all the data collected by various humanitarian and development agencies working on the Horn of Africa response.

CHAPTER THREE: PROBLEM STATEMENT, JUSTIFICATION, THEORETICAL FRAMEWORK AND OBJECTIVES

Development and humanitarian aid have saved lives and met immediate program objectives, but they have not increased the capacity of affected populations to withstand future shocks and stresses. RAN's resilience-based approach to programming provides a framework for analyzing resilience and strengthening resilience to shocks and stresses. RAN engaged universities in four regions to generate local innovative solutions to specific development challenges in African communities.

3.1. Problem Statement

The ResilientAfrica Network aims to develop and operationalize a scientific, data-driven and evidence-based framework for understanding, measuring and monitoring resilience in vulnerable communities in sub-Saharan Africa. This requires a thorough understanding of the dimensions of resilience in the geographical areas of focus. Each of RAN's four RILabs proposed priority themes and geographical areas of focus but required more knowledge of the range of vulnerability factors, underlying drivers of vulnerability and adaptive capacities of their target communities. These three factors are crucial to understand resilience and develop a framework to measure it in specific contexts. It is also important to understand the underlying causes of shocks and stresses and their diverse effects the wellbeing of the people in the affected communities.

Available information was anecdotal, the objective of the rapid assessment in Borana Zone, Ethiopia, was to gain a deeper understanding of the variability of factors that helped the Borana communities manage, mitigate and adapt to recurrent drought. The findings would inform the development of resilience dimensions and measurement tools for the Horn of Africa context in which RAN's resilience programming will be implemented. Guided by a preliminary literature review of a narrow range of resources, he RILabs conducted more extensive literature reviews and rapid assessments (community consultation of key informants) to validate their thematic areas of focus and target populations. For an in-depth understanding of the ecology of resilience in each of the target populations, the RILabs studied the severity of shocks and stresses; their primary and latent causes and effects; factors that make populations, infrastructure and institutions vulnerable to shocks; and existing adaptive factors.

3.2. Objective of the Rapid Assessment

The objective of the rapid assessment in Borana Zone, Ethiopia, was to gain a deeper understanding of the variability of factors that helped the Borana communities manage, mitigate

and adapt to recurrent drought. The findings would inform the development of resilience dimensions and measurement tools for the Horn of Africa context in which RAN's resilience programming will be implemented.

3.3. Research Questions

This study attempted to answer the following questions:

1. What are the major and latent factors that make the Borana pastoralist communities vulnerable to recurrent drought?
2. What local/external adaptive factors help or could help the communities overcome the effects of recurrent droughts?

3.4. Theory of Change

The resilience of people and systems in Africa will be strengthened by leveraging knowledge, scholarship and creativity across RAN to incubate, test and scale innovations that strengthen capabilities and reduce vulnerabilities identified by a scientific, data-driven and evidenced-based resilience framework for sub-Saharan Africa.

3.5. RAN's Resilience Framework

RAN defines resilience as the capacity of people and systems to mitigate, adapt to and recover and learn from shocks and stresses in a way that reduces vulnerability and increases wellbeing (http://www.ranlab.org). A resilience framework is a conceptual tool that guides:

- Understanding shocks and stress that affect populations and systems and the factors that make them vulnerable to those shocks and stresses
- Understanding what makes people able to live fulfilled lives and people and systems able to mitigate and respond to shocks and stresses
- Identifying resilience dimensions and indicators and assessing system resilience
- Identifying entry points and prioritizing interventions to strengthen capacities and reduce vulnerabilities to build systems' resilience

Strengthening systems' resilience requires understanding contextual factors, resilience dimensions and protective strategies. To accomplish this, RAN developed a framework involving a four-step process including 1) analyzing the context, 2) understanding and prioritizing resilience dimensions, 3) developing relevant interventions and 4) evaluating their effectiveness in increasing resilience (figure 2).

Figure 2: RAN's Resilience Framework

3.5.1. Context Analysis

In the context of the Borana Zone study, the first step was to define resilience. In the Borana community, this involved identifying the main shocks and stresses related to recurrent droughts as well as the units of application (i.e., individuals, households, communities or systems). This was done through a preliminary thematic literature review and a qualitative rapid assessment involving consultation of the Borana communities, followed by prioritization of challenges to be targeted by RAN.

3.5.2. Resilience Dimensions and Protective Strategies

The second step in the RAN framework is to explore the drivers of resilience. The Ethiopia study collected primary qualitative data to understand and analyze the factors that make the Borana communities capable of managing drought-related stresses and shocks, the latent factors that keep them trapped in vulnerability and their existing adaptive capacities. This information was used to formulate dimensions of resilience in the Borana and Ethiopian context. These dimensions will be used to develop indicators, which will be translated into quantitative tools to measure the prevalence of different resilience factors in the RILabs' target populations.

3.5.3. Resilience Interventions

After prioritizing dimensions and thus entry points for interventions, the third step is to identify, incubate, test and scale innovations to strengthen capacity to address specific challenges/stressors. Stanford University will provide technical support to create an enabling environment for all four RILabs to identify and incubate innovations and a team-based Massive Open Online Course (MOOC) platform to test and scale innovations.

3.5.4. Resilience Pathways and Outcomes

The final step will be to assess the results of the interventions to strengthen resilience and the impact of improved resilience on wellbeing. RAN will develop an evidence-based management strategy to assess progress toward achieving the three strategic objectives by monitoring outputs and outcomes. Data collection methods comply with assumptions required for statistical rigor (e.g., random samples for survey methods), and the impact of innovations and online courses are assessed empirically.

CHAPTER FOUR: METHODOLOGY

This chapter describes the study population, study design, sampling, data collection tools and procedures, and data quality assurance.

4.1. Study Setting and Study Population

During RAN's consultative meeting in April 2013 in Kampala, Uganda, Borana Zone in Oromia National Regional State was proposed as a target for RAN-supported resilience programming in Ethiopia, under the HoA RILab based at Jimma University. Borana Zone was identified as the most drought-affected pastoralist area in Ethiopia. In line with RAN's guidelines, two districts were selected as operational sites.

Arero and Dhas districts are the most vulnerable in the zone to drought and human-made shocks such as conflicts. Violent conflicts have disrupted pastoral grazing movement patterns and community coping strategies against adversity and drought, thereby increasing their vulnerability to shocks and stresses. There were four episodes of conflict in Arero, Dhas and Moyale districts between 2000 and 2005 (Odhiambo, 2012)including two in Dhas in 2001 and in 2004. Over the past decade, various districts of Borana Zone had been affected by droughts, mainly caused by environmental variability, competition over scarce resources, cattle raids and counter-raids(Odhiambo, 2012)Therefore, it was assumed that the more often a district experienced conflicts, the more vulnerable it would be to droughts and related shocks as well as their consequences.

Arero District has an area of 10,890km^2 and a population of about 50,000, of which 85% are pastoralists and the rest are farmers. The district is administratively divided into 21 *kebeles* (the lowest administrative units). Ethnically, 68% of the population is Borana Oromo and 20% is Gujii Oromo. Arero has 30 primary schools, one junior secondary school, three health centers and 18 health posts. The district lacks a power supply and telecommunication service. Only 20% of the population has access to potable water sources (Arero District Planning & Economy Office, 2013).

Dhas district has an area of 3,447km2 and a population of 56,837, of which 87% are pastoralists and the rest are farmers. The district is administratively divided into 12 kebeles. There are 34 primary schools, one junior secondary school, four health centers, and nine health posts in the district. Only 15% of the population has access to potable water (Dhas District Planning & Economy Office, 2013).

The primary study populations were four *kebeles*, two each from Arero and Dhas districts. The secondary study population was representatives of agencies and organizations involved in resilience programming to address recurrent drought in the districts.

4.2. Study Design

The study was a rapid qualitative assessment using focus group discussions (FGDs) and key informant interviews (KIIs) to collect data. A grounded theory approach guide the development of dimensions for understanding resilience to effects of environmental variability and drought in the target communities. Grounded theory is a qualitative research approach used to inductively develop theories/dimensions that are grounded in systematically gathered and analyzed data. It starts with individual experiences and develops progressively more abstract conceptual categories to synthesize, explain and understand data and to identify patterned relationships within the data (Glaser & Strauss, 2006). Hypotheses are generated inductively from the data and developed throughout the research process, in contrast to deductive theory, which is based on a priori assumptions(Glaser & Strauss, 2006);(Dunne, 2011).

Grounded theory as a research methodology has raised a debate about how and when to consult existing literature (Dunne C., 2011). Initially, proponents of this approach discouraged a detailed literature review at an early stage of the research process (Glaser & Strauss, 2006)because it could contaminate data collection, analysis and theory development by leading researchers to impose existing frameworks, hypotheses or theoretical ideas on the data. This could in turn undermine the focus, authenticity and quality of the grounded theory research (Glaser, 1998); (Nathaniel, 2006) and (Holton, 2007).

As the approach evolved, this "purist" position changed significantly (Weiner, 2007),(Strauss & Corbin, 1994) to recognize the advantages of an early literature review (Dunne, 2011). It could provide a convincing rationale for a study, including a specific research approach (McGhee, G. et al., 2007), ensure the study had not already been done (Chiovitti & Piran, 2003), highlight gaps in existing knowledge (Creswell, 1998)help contextualize the study (McCann & Clark, 2003), orient the researcher (Urquhart, C., 2007), provide information on how the phenomenon had been studied to date (McMenamin, 2006). It could also help the researcher develop sensitizing concepts (Coffey, A. & Aktinson, P., 1996), gain theoretical sensitivity, avoid conceptual and methodological pitfalls (McGhee, G. et al., 2007), become aware of, rather than numb to, possible unhelpful preconceptions (Maijala, H. et al., 2003) and promote clarity in thinking about concepts and possible theory development (Henwood & Pigeon, 2006). Ignorance of the relevant literature at an early stage can leave the researcher open to criticism—it is not clever to rediscover the wheel(Coffey, A. & Aktinson, P., 1996). Open-mindedness should not be mistaken for the empty mindedness of a researcher who is not adequately grounded in the research traditions of a discipline. It was also suggested that researchers who use grounded

theory methodology should be well versed in the topic in order to take an informed and defensible position on how to apply it. It was also argued that it is unrealistic for a researcher to undertake a study without prior knowledge or ideas that might contaminate the research by imposing assumptions and preconceptions (Dunne, 2011). These compelling arguments guided the design of this study, which conducted a literature review before collecting and analyzing data.

4.3. Sample Size and Sampling Techniques

Grounded theory employs theoretical sampling and constant comparison processes. Theoretical sampling entails interplay between data collection and data analysis (Strauss & Corbin, 1998). This study began data transcription and analysis in the field after the first interview and FGDs. Earlier interviews were used to clarify and elaborate on what was said in subsequent interviews. Hence, responses guided the inquiry process including the sampling methods through theoretical sampling.

4.3.1. Focus Group Discussions

As this was a qualitative study, the sample size was meant to achieve phenomenological saturation rather than generalizability. For the FGDs, pastoral *kebeles* that were vulnerable to recurrent droughts were identified in consultation with the district disaster prevention offices or food security offices. For adequate breadth and depth of information, 10–15 FGDs are suggested for a study(Hancock et al., 2007). Three FGDs were conducted in each *kebele* (for a total of 12), involving adult males and females (25 years and older) as well as informal and opinion leaders (religious and traditional prominent figures) as separate groups. Each FGD included eight to 12 participants who were purposively selected in consultation with the *kebele* administrative bodies. Table 2 shows the sampling scheme for the FGDs.

Table 2. Sampling scheme for FGDs

Categories of FGD participants	No. of FGDs per district		
	Arero	Dhas	Total
Adult males	2	2	4
Adult females	2	2	4
Informal leaders/prominent figures	2	2	4
Total	**6**	**6**	**12**

4.3.2. Key Informant Interviews

As a rough guide, theoretical saturation will probably be reached after 20–60 in-depth interviews (Beverley H, 2007). This study purposively selected 45 key informants based on the rich information they might have about their communities' experience related to recurrent droughts. Respondents were considered at all levels in the development, disaster prevention, agriculture and food security sectors at *woreda*, zonal, regional and national levels. They included heads, focal persons or representatives from the offices of Administration; Pastoralist Development; Disaster Prevention and Preparedness; Health; Education; and Women, Children and Youth, as well as chief administrators, health extension workers and Pastoralist Development Agents (ADA) in the selected *kebeles*.

At the time of the data collection, eight NGOs were operating in Arero District and 10 in Dhas District to support resilience building efforts. Because of the limited resources for the study, only 30% of the NGOs in each district were identified in consultation with the respective District Administration Offices. The study interviewed the heads of two NGOs in Arero and three NGO representatives in Dhas. Table 3 shows the sampling scheme for the KIIs.

Table 3: Sampling Scheme for KIIs

Target institution/level	KIIs per district		
	Arero	Dhas	Total
Kebele Administration	2	2	4
Health post	4	4	8
Kebele Pastoralist Development Center	4	4	8
District Offices	7	7	14
Ministry of Agriculture and Rural Development (ARD)	-	-	1
National Disaster Prevention and Preparedness Authority	-	-	1
Oromia Bureau of ARD	-	-	1
Oromia Pastoralist Development Commission	-	-	1
Borana Zone Department of ARD	-	-	1
Borana Zone Disaster Prevention and Preparedness Department/Unit	-	-	1
NGOs	2	3	5
Total	**15**	**16**	**45**

4.4. Data Collection Tools and Procedures

The data collection tools were developed based on the literature review and refined by inputs from participants in a workshop in Jimma from July 22 to 25, 2013. The qualitative data from the FGDs and KIIs provided more detailed information and clarified certain issues. The data collection tool was developed based on the major thematic areas that explored vulnerability of pastoral communities in the two districts to recurrent droughts. The tool was organized under four themes: 1) further clarification of recurrent droughts, 2) vulnerability factors, 3) drivers of vulnerability and 4) adaptive factors, with several possible probe questions.

The assessment teams asked local authorities in each selected *kebele* to organize the FGDs. The team members introduced themselves and explained the purpose of the study. After obtaining informed consent, they ensured the privacy of the respondents and confidentiality of the information. The facilitators moderated and guided the discussions with appropriate probes until the maximum possible information was explored. The assistant facilitators helped the primary facilitator by posing probe questions as appropriate and by setting up and monitoring a voice recorder. The note taker recorded responses and non-verbal interactions and expressions relevant to the study themes. The observer was responsible for observing the entire discussion process, helping the facilitator control the sessions and giving feedback during the post-session briefs. He also recorded the non-verbal interactions and expressions relevant to the study themes. On arrival at the respective sites, the teams conducted the first FGDs and interviews to pre-test the tools. They held discussions to reflect on the usability and applicability of the tools and make adjustments as needed.

4.5. Data Management and Analysis

In grounded theory, data saturation, the desired endpoint, is achieved when no new information is generated (Strauss, A. & Corbin, J., 1998). Data management and analysis followed a constant comparison process in which the assessment team compared thoughts or ideas and perceptions embedded in the data within and across respondents and data sources to help group common concepts into categories and explore conceptual linkages among categories.

The responses from each FGD and KII were transcribed verbatim and then translated into English. Transcription was done by the graduate students/assistant facilitators under the guidance of the primary facilitators. The graduate students/assistant facilitators checked the quality by listening to some of the audio records. The supervisor also listened to some audio records to validate the transcriptions. The manifest content analysis was followed by latent content analysis. The transcripts were read and re-read by a team of three faculty members, who then assigned codes and designed a coding structure (open coding). ATLAS.ti7.1 was used for data management and analysis. Data meaning units were then aligned under their respective codes.

This was followed by axial and selective coding to develop higher codes/categories and sub-themes. Sub-themes were further reviewed to develop overarching themes (typologies). Typologies were the bases for deriving constructs and dimensions in the resilience assessment framework for the respective target communities. Field notes and memos were used to elaborate the concepts or dimensions that emerged.

4.6. Data Quality Assurance

To ensure the trustworthiness of the study, various quality control measures were applied. The data collectors were trained intensively for 2days on the data collection methods and approaches. The tools were translated from English into Afan Oromo, the local language, and then translated back into English by a different person who had the expertise to ensure consistency of the meaning. Then the original and second English versions were compared and a few discrepancies were corrected. The first FGDs and KIIs were used to pre-test the tools in the field and make necessary adjustments. Experienced supervisors closely supervised the data collection process. They debriefed with the facilitators at the end of each day and after each FGD and KII. Facilitators submitted their field notes and impressions from each FGD and KII to their supervisors. Data from the FGDs and KIIs were triangulated to ensure internal validity. Thick description was used to enhance credibility. Relevant operational definitions were provided to control for threats to construct validity. The final report was made impartial through neutral reporting and fair reflection of the findings without personalizing the study participants. Finally, the findings and interpretations were presented to stakeholders including representatives of the target communities for feedback on the interpretations and the dimensions that emerged from the findings.

4.7. Composition of the Data Collection Teams

For ease of mobilization and control of the team members and the requisite technical mix, eight postgraduate students and four faculty members took part in the study. There was one team in each district, consisting of four postgraduate students and two faculty members. The team members were from multidisciplinary backgrounds, specifically public health and social sciences, who had prior experience in qualitative data collection techniques and were fluent in Afan Oromo. During the fieldwork, each team was divided into two sub-teams of three members each, including a facilitator, note taker and observer. The faculty members were both facilitators and supervisors. They organized, analyzed and interpreted the collected data and played a leading role in peer reviewing all outputs of the assessment and consolidating the final report.

4.5. Training of Data Collection Teams

The data collection teams were trained for 2days by the RILab team, assisted by a faculty member with ample experience in qualitative research methods from public health and social sciences. The training involved both theoretical and practical demonstration using role plays.

4.6. Ethical Issues

This study made limited inquiries about individual experiences and was not designed to measure the attributes of individuals. Questions asked of key informants referred to the geographical area and population as a whole and not to individuals, and therefore did not involve any invasiveness of human subjects. This initial appraisal was used to develop a more detailed study protocol. Ethical approval was provided by the Institutional Review Board (IRB) of Jimma University. Official permission was obtained from concerned bodies at all levels.

All participants expressed fully informed consent individually at the time of recruitment. Informed consent was also obtained for using the voice recorder with no identification of respondents. The possible risks and benefits of participation were explained to each respondent, as was their right not to answer any question if they did not want to and to stop participating at any point. Participation in the study posed only minimal risk of discomfort, and no study participant was forced against his/her will to provide information. All information acquired through this study was kept confidential, and access to the data was restricted to members of the study team. To attain confidentiality, information was identified using codes, data were analyzed without revealing the identity of the individuals and no names of the participants were included in the reports or presentations. The data storage conditions were maintained until the full report was written, and all potential datasets were carefully communicated to concerned bodies.

4.7. Variables and Definitions

This study used the following definitions of variables:

- **Resilience:** The capacity of people and systems to mitigate, adapt to and recover and learn from recurrent droughts in a manner that reduces vulnerability and increases well-being (RAN).
- **Risk:** The probability of suffering damage to life, property, economic status and the environment from recurrent droughts for a given area and reference period
- **Shock:** The occurrence of recurrent droughts resulting in a significant challenge to livelihoods
- **Stress:** A slow-onset or chronic occurrence of recurrent droughts resulting in a significant challenge to livelihood
- **Vulnerability:** The characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of recurrent droughts
- **Adaptive capacity:** The combination of all the strengths, attributes and resources available in a community, society or organization that can be used to avert some or all of the negative effects of recurrent droughts

- **Physical infrastructure:** Built structures (e.g., buildings, roads, bridges, schools, health facilities, churches, mosques)
- **Livelihoods infrastructure:** Holdings on which households or communities depend for income (e.g., gardens, crops, stored produce, livestock)
- **Institution:** Leadership or governance structure

CHAPTER FIVE: RESULTS

After the initial analysis, the research team analyzed a dataset of 12 FGDs and 36 KIIs to derive dimensions of resilience in order to identify entry points for innovative interventions.

5.1. Resilience Dimensions

Eight resilience dimensions emerged from a systematic process of clustering related codes or sub-dimensions at various levels and subsequent discussion. These include 1) *Wealth*, 2) *Livestock*, 3) *Social Capital*/*Community Networks*, 4) *Psychosocial Wellbeing*, 5) *Infrastructure/ Social Services*, 6) *Environment*, 7) *Human Capital and 8) Governance/Peace/Security*. To assess the capacity of people and systems in Borana Zone to anticipate, adapt to and learn from shocks and stresses, the study explored the following broad themes of each resilience dimension:

1. **Risks:** Further clarification of recurrent droughts affecting the study populations, their frequency, their primary effects in the target communities and their secondary effects
2. **Vulnerability factors:** Factors that make people, infrastructure, and institutions in these communities vulnerable to recurrent droughts
3. **Drivers of vulnerability:** Factors that make people, infrastructure and institutions fail to permanently resist, reduce or eradicate their vulnerability factors
4. **Adaptive capacities:** Factors that to varying degrees empower the communities and their institutions to resist the effects of recurrent droughts in their settings

5.1.1. Wealth

RAN substituted *Wealth* for *livelihood* after the Resilience Workshop in Kampala in 2014 as part of its standardization of resilience dimensions. The dimensions of *wealth* and *livestock* may seem similar, especially in a pastoral economy, but this study analyzed *Livestock* as a separate dimension. There are some links between these dimensions, which have many things in common. The fact that 355 quotes from participants in this study were shared between these dimensions reflects their overlap. However, in the Borana context, livestock goes beyond the dimension of *Wealth* in that it comprises sub-dimensions such as fodder supply, livestock breeding/improved livestock breeds, livestock health services, livestock rehabilitation, herd size control, livestock diversification, segregation and insurance. Moreover, because the *Wealth* dimension is already too broad, merging these two dimensions may cause too much collapsing of the data and result in too little attention to livestock, which is a crucial resilience dimension for this pastoralist community.

One key informant said that drought had not only exposed the pastoralist communities to food insecurity, but also aggravated poverty: *The people use cattle as their food and cloth, to send their children to school and as their means of generating household income in general. Drought has impoverished most of the people and degraded their capacity in this regard, worsening their vulnerability.* The participants generally emphasized poor livelihood diversification practices as major vulnerability factors. Livelihood diversification was also the most frequently coded suggested adaptive mechanism or solution, mentioned in three of 12 FGDs and nine of 36 KIIs. A widely accepted adaptive mechanism was selling cattle before a drought and saving the money to use during the drought to buy fodder. A key informant explained, *Because of the training given to the community through the extension program, people have started to sell their cattle and to save the money in the bank.* Another commonly reported strategy was building or buying houses in urban areas to rent for additional income. A few participants said they earned income from forest products, from which they could produce gum to make money to resist the effects of drought.

This dimension presents the role of alternative livelihood opportunities in making the target communities more resilient to the effects of recurrent droughts. It includes diverse economic activities such as gum production, agriculture/farming, livestock rearing, business, moving to urban centers and adopting values and norms that can positively or negatively affect community resilience. *Wealth* describes financial assets (e.g., saving money in a bank and getting access to credit) and non-financial assets (e.g., building a house in a town), as well as asset redistribution. It is related to household food security, food availability and access to adequate and safe food and non-food items necessary for survival, such as shelter, clothing and water. Moreover, the dimension indicates the connection between some aspects of livelihood diversification and vulnerability. For example, cutting trees to make charcoal or firewood can lead to deforestation, land degradation, migration and unstable living conditions.

Adaptive Strategies

The study found several small-scale adaptive strategies that could improve community resilience. These included growing crops, producing gum, fattening oxen, restocking livestock, loaning milk cows from wealthy households to the poor (*dabare*) and eating wild plants and animals. These mechanisms were practiced only on a limited scale, however, and hence were insufficient to build the resilience of the local communities. Interventions that would boost community wealth and thus long-term resilience to recurrent drought included expanding alternative livelihood opportunities through skill development and encourage participation in agriculture/farming, initiating irrigation technology/agriculture; ensuring access to financial services and promoting saving and credit services (sell cattle and deposit in bank); income generating activities (e.g. small group microfinance, entrepreneurship, business development with initial capital support), fattening oxen; engaging in trade/business (e.g., opening a shop);

engaging in gum production; financial and non-financial asset development (e.g. building a house in town and renting it); reducing mobility and adopting a settled lifestyle. Additionally, it was suggested that attitudinal change or mindset change towards livelihood and economic diversification, education, settled way of life and livestock rearing has to be emphasized to build community's resilience.

Coping Strategies

The data showed that community members had been using various coping strategies to mitigate and absorb the impacts of recurrent droughts. These short term coping behaviors included, as appeared in the data, 1) short term income generation activities (e.g. charcoal production, and selling firewood)-which actually lead to deforestation; 2) relying on external aid (e.g. external support from NGOs and GOs (e.g. food distribution and school feeding)-which promote dependency syndrome; 3) (cutting meal both in frequency and amount; 4) migration to towns and abroad to seek job-which in turn puts migrants at increased risk; 5) temporary traditional support on voluntary basis (e.g. sharing milk, and meat); 6) residential migration in search for a safer place which in turn results in increased barriers to social services and often caused hostile competitions over scarce resources, resulting in conflicts, bloodshed, loss of lives and school drop-outs; 7) taking large cattle to market for sale (often skinny and morbid cattle) at the time of severe drought crisis, which actually force them to sell their cattle at lower price than the usual to buy grain at an inflated price and creating an imbalanced exchange

Vulnerability Factors

The data revealed several vulnerability factors that negatively affected the wealth of the target community. Most of these were related to lack of access to alternative livelihood opportunities and attitudes and cultural norms that placed a higher value on large cattle herds and a mobile lifestyle than education and participation in alternative economic activities other than livestock production. Lack of knowledge and life skills development, lack of empowerment and support, low literacy and limited education negatively affected wealth and livelihood opportunities. Low literacy and traditional cultural norms affected peoples' savings habit and attitudes toward entrepreneurship. On the other hand, livestock mobility often caused hostile competition over scarce resources, resulting in conflicts that cause loss of assets and lives. The traditional support and asset redistribution system has eroded, increasing the vulnerability of drought-affected and poor families. Unstable and short-term external aid created dependency and aggravated the vulnerability of the local community. Less diversified and less drought-resistant livestock adversely affected livestock production and seriously limited household wealth. Local people felt trapped in poverty, failing to see and take advantage of opportunities to improve their wealth. Many participants in FGDs and KIIs mentioned that poor families, children, women, lactating women, people with disabilities, people who relied on less diversified livestock and youth were

most affected by recurrent droughts. It was also mentioned that people who rely solely on agriculture earned a less reliable income.

Causes and Effects

Recurrent droughts have affected household wealth by causing loss of livestock, the main economic asset and food source in Borana Zone. Loss of livestock led to acute and chronic food insecurity, which in turn caused malnutrition, especially among children, increasing their vulnerability to various diseases. Household food insecurity led to increased school dropouts, which in turn lowered human capital by decreasing literacy and later economic opportunities. As reflected in the data, illiteracy, combined with restrictive cultural norms, values and attitudes, led to poor savings habits, limited participation in alternative livelihood opportunities and decreased household income. Limited participation in alternative economic opportunities made households more vulnerable and trapped them in poverty. Decreased household income forced people to turn to shortsighted coping mechanisms such as charcoal production, which caused deforestation and environmental degradation that would eventually destroy this source of livelihood. Environmental degradation in turn reduced livestock productivity and health because of a shortage of water and animal feed and triggered climate change, leading to recurrent droughts. Wealth conditions in the target communities were also connected to *Psychosocial Wellbeing*, *Social Capital/Community Networks* and *Governance/Peace/Security*. Decreased household wealth led to psychosocial problems resulting from family disruption and frequent loss of livestock and other assets. Loss of assets and increased poverty drove crime and conflicts, which in turn caused stress and depression. Poor governance, accompanied by lack of peace and security, led to loss of property, assets and human life, which in turn decreased wealth. Similarly, decreased wealth weakened community networks and relationships.

5.1.2. Livestock

This dimension deals with the vulnerability of livestock to recurrent droughts and their effects in the Borana pastoralist community. It also includes factors that determine people's adaptive and copying strategies in managing their major source of livelihood—animal diseases and health care, fodder/forage production and management, control of the animal population, herd diversification and classification, animal insurance and rehabilitation. Finally, this section connects the consequences of traditional livestock production on *Wealth*, *Psychosocial Wellbeing*, *Human capital* and *Environment*.

Adaptive Strategies

As shown in the data, the local communities used various strategies to manage the impacts of recurrent droughts on their livestock. These included acquiring or breeding drought-resistant cattle, reducing the number of cattle and relying on government and NGO assistance such as the

Safety-Net Program, balancing the number of cattle with the land's carrying capacity and preserving fodder for the dry season.

As reflected in the study, the government was implementing a project called Borana Water Network, with an estimated budget of about 2 billion birr, to help the inhabitants cope with recurrent droughts. The network was planned to cover about 2000 km. Large water reservoirs had been developed in many parts of the network. Some study participants believed that water distribution through the network would solve the critical shortage of water and pasture in the area. Participants also reported digging ponds and large reservoirs for water preservation and rehabilitating water sources through communal efforts.

Participants also mentioned shifting cattle herding roles from children to adults, who could travel long distances to get access to pasture and water. Buying animal insurance as part of a livestock risk management approach was reported as another adaptive mechanism. One NGO was said to be implementing the insurance system to help people recover their livestock. One herdsman had received 124.00 birr for one goat.

Coping Strategies

The most common coping strategies used by the study communities included migrating to safer places and temporary self-resettlement, segregating herds to give priority to calves and lactating cows, enclosing grazing land (*kaloo*), establishing rehabilitation centers for emergency support and purchasing and preserving fodder. Most of the participants agreed that moving to places that were safer for their herds during a severe drought was an effective copying strategy. When droughts became very serious, people usually moved from Borana Zone or to the southern part of the country, for example, from Yabello or Dirre districts to Burji, Konso special district in SNNPR in search of grass and water. People also migrated abroad, commonly to northern Kenya. Another widely accepted coping mechanism was selling cattle before the onset of drought and saving the money in a bank to use during the drought or to buy cattle when the drought ended. People also used the money to buy cattle fodder from other areas to keep it for the hard times. As food shortages increased, older and younger cattle became too weak to travel long distances to find pasture, and people were forced to take fodder and water to the emergency camp or satellite feeding sites.

Vulnerability Factors

Unfavorable local cultural values and beliefs, water scarcity, the high cost of animal feed, diseases that threaten less resistant livestock and lack of access to responsive veterinary health services made the Borana communities susceptible to the damaging effects of recurrent droughts. Cultural values and norms that guide the lifestyles of the study communities were other

vulnerability factors. Ownership of a large number of cattle was highly valued in the area. People depended more on the quantity of their cattle than the quality, and in some areas the animal population was increasing beyond the carrying capacity of the land. It was mentioned that people became very worried at the thought of selling their cattle to limit their numbers. Failure of the local community to accept the extension program designed by the government and aid dependency were also reported. Participants generally felt that the land was becoming increasingly arid and consequently they were facing shortages of water and fodder. Depletion of ground water level was also mentioned.

The high cost of animal feed was claimed to be a key challenge to the communities' adaptive capacity. Some participants thought that drought in one area might affect the situation in another area by decreasing prices in the local market. One key informant at district level believed that international markets were setting ever-higher barriers to access basic social services, while another key informant from one of the NGOs operating at central level thought that nobody wanted to sell cattle at the price fixed by the government, which in turn increased their vulnerability. Some participants claimed that the cattle were less resistant to drought conditions, including animal diseases, aggravated by lack of access to responsive veterinary health services.

Causes and Effects

This dimension generally connects the consequences of recurrent droughts for livestock with at least two other dimensions in this study, *Wealth* and *Environment*. Poor livestock conditions that resulted from recurrent droughts increased poverty and reduced productivity, and drought was in turn driven by poor environmental conditions, forming a vicious circle and worsening livelihoods.

5.1.3. Social Capital/Community Networks

In the Borana pastoralist communities, individuals, households and groups were connected through support groups; traditional resource redistribution and sharing; support for the most disadvantaged community members, particularly in restocking livestock and sharing water sources and grazing land; and cooperation that would enable community members to cope with the shocks and stress of recurrent droughts and thereby develop their own adaptive strategies. This dimension also highlights the connection between degradation of community networks, social support and social capital; decreased capacity of the local communities; increased vulnerability; and recurrent droughts.

Adaptive Strategies

One of the adaptive mechanisms of the Borana pastoralists is a traditional social security system that takes the forms of asset redistribution or sharing of available scarce resources. Most participants believed that traditional asset redistribution systems were important social capital in

Borana communities to support poor households or people who had lost many assets because of droughts. Most study participants viewed people living outside drought-affected areas as culturally responsible for supporting those living in affected areas and replacing their lost assets. This support was implemented in various ways. Some people gave cattle, and some gave milk to the children of affected families. Specific asset redistribution systems were *buusa-gonofa* (restocking of drought affected households by clan members) and *dabare* (lending milk cows to drought-affected households on a temporary basis).

However, participants said that the traditional social support schemes had been weakened and degraded by recurrent droughts, leaving the local communities less able to adapt to their harmful effects. Some community members described the prevailing socioeconomic situation by saying, *No one is better than anyone else*. Frequent environmental stresses had made people unwilling to share resources with drought-affected families. An informal leader who participated in a FGD said, *When drought happens, cattle and people from far areas come to our grazing land and create overgrazing of the grass. They competitively use our meager resources, and after devastating the environment and depleting the resources, they go back to their own grazing land. This creates shortage of pasture and water.* As discussed in detail under adaptive mechanisms, social capital was seen as a key aspect of local adaptive capacities that needed to be strengthened.

Coping Strategies

The Borana pastoralist community had limited coping strategies. One strategy was making a concerted effort to keep the existing social network within a clan or an extended family in order to share the scarce resources as much as possible. In this case, redistribution of livestock and other assets in the form of loan was practiced, though with decreasing scope in recent years; the traditional system of asset redistribution popular among the Borana pastoralists is known as *Dabere*. Seeking supports from external bodies, such as GOs and NGOs was another coping strategy for the weakened community networks/social capital; however, it had its own undesirable effect like dependency syndrome.

Vulnerability Factors

Degradation of traditional social networks and social support systems could be attributed to various factors, such as external aid causing dependency syndrome, formal governance system weakening traditional schemes, giving due emphasis to formal and modern systems of administration, paying little attention to the former, decreased people's capacity and willingness to contribute and share scarce resources. As indicated by the participants of many FGDs and KIIs, these traditional social support systems were less effective to help the community to mitigate and adapt to recurrent droughts and their harsh effects.

Causes and Effects

Climate change, environmental degradation, decreasing natural resources and economic assets, aggravated and shared poverty is a major driving force for weakened community network, social support systems and social capital; in this regard, some community members described the prevailing socioeconomic situations by saying: *"No one is better than any other persons*." In addition, community members were less organized to support one another. Consequently, people's attitudes towards cooperation and mutual support have been turning unfavorable. The community network and social capital have been adversely affected by the deteriorating situations in the environment, natural resources, livelihood, and livestock production; formal governance has not given due emphasis to strengthening the existing community networks/social capital. The *Gada* system, the local administrative system, is now becoming weaker due to frequent droughts. The community hardly exercises the *Gada* ritual ceremony because of displacement and the concomitant absence of *Gada* leaders and cattle. Moreover, the ceremony is normally organized around water sources, but in drought times, those water sources get dry. When they travel long distance for the sake of finding a water source and observing the *Gada* ceremony, the Borana Pastoralists encounter various problems. "*... the* Gada *leaders often move to another area. When they move, they have to take their cattle with them. Since they travel long distance on foot, their animals and their children become very weary and they suffer a lot. Their cattle die.*" (A KII participant) *"Traditionally, we have social support systems like the* Gada *system and* Buusa–Gonofa *(social support mechanism). However, due to the effects of drought, we cannot help each other, hence, it is affecting our culture*" (KII-PDAC). Buusa-Gonofa is a traditional social support system established to help the disaster affected families. However due to the effects of recurrent droughts, this social support system is not properly functioning. According to FGD participants, this system has been severely affected due to increasing poverty which, in turn, resulted from recurrent droughts. "*The number of cattle each Borana pastoralist owned decreased as a result of drought and acute shortage of food; and this has resulted in weakening of social security or network of Buusa-Gonofa institution*" (FGD-adult female).The degradation of community networks/social capital has also have negative implications for development of human capital, environmental regeneration, acquisition of wealth, as well as peace and security.

5.1.4. Psychosocial Conditions

Dimension Description

This dimension describes information related to psychosocial impacts of recurrent droughts on the target community. It mainly contains information related to the community members' stress, depression, distress, anxiety, frustration, fear, mental disorder, hopelessness and tendency to commit suicide due to loss of livestock and other assets, destruction of infrastructures and disruption of livelihood and family life. Additionally, it also reflects the stress and anxiety that

emanate from fear of frequent occurrence of droughts, conflicts, displacement/migration, disruption of family life and cultural rituals, all affecting the psychosocial wellbeing of the Borana community. It also deals with perception of wellbeing, happiness, perception of fulfillment and satisfaction, including perceived enabler of fulfilled life. Moreover, it touches violence or crime and emerging unhealthy behaviors such as chat (khat) chewing and drinking alcohol in excess had in some cases resulted from this frustration, furthering straining social relationships and psychosocial wellbeing.

Adaptive Strategies

Some study participants mentioned keeping large herds of livestock to buffer shocks and stress, while others mentioned selling some livestock and saving money in the bank. Others mentioned developing assets in towns and using traditional support systems of asset redistribution (*busa-gonofa* and *dabere*). Interventions suggested to help people live a stable and fulfilled life included improving access to water supply, health care (for humans and animals), credit and savings and an adequate supply of food; expanding schools/education, markets and road networks and ensuring peace and security. Improved life skills, production of livestock fodder and reducing mobility and migration would also help people achieve psychosocial wellbeing.

Coping Strategies

One coping strategy mentioned by the participants in this study was keeping large herds to reduce the chance of losing all of one's cattle. Another was praying to God for divine support at times of severe drought and psychosocial trauma. Establishing rehabilitation centers was also emphasized as a strategy to reduce stress and enhance the psychosocial wellbeing of community members affected by recurrent droughts. The government and NGOs provide support such as food, water and hay and school feeding to help communities recover from stress, but participants felt this external aid caused dependency and negatively affected local people's adaptive capacity. The study participants did not suggest any interventions for this dimension, and there were no ongoing interventions that would help them improve their psychosocial wellbeing. Some community members said they lived in a constant state of stress, expecting recurrent droughts.

Vulnerability Factors

The data showed that the following factors increase vulnerability to psychosocial problems in the target communities:

1. Degradation of community networks and a culture of dependency on external aid
2. The influence of the formal governance system
3. Recurrent droughts and increased poverty

4. Conflicts, social insecurity/instability and crime induced by recurrent droughts and competition over scarce resources, which in turn led to loss of property and disruption of livelihood and family life, with long-lasting negative impacts on the psychosocial conditions of the communities
5. Massive displacement and migration
6. Disease outbreaks affecting both humans and animals and lack of access to responsive health care
7. Disruption of family life and livelihood as well as cultural values and norms
8. Frequent loss of livestock and other assets as well as human life from displacement and conflicts following drought crises
9. Lack or disruption of basic services (water, health care and electricity)
10. Lack of rehabilitation services and psychosocial care
11. Household food insecurity from an excessive dependence on livestock for food
12. Lack of responsive and timely aid and support from the government and NGOs
13. Lack of engagement in diversified economic activities that do not depend on the availability of water/rain
14. Poor savings habits that contribute to socioeconomic instability and stress

Many FGD and KII participants discussed a wide range of vulnerable groups including children, women, elders, pregnant and lactating women, the rich and the poor. Additionally, it was mentioned that people who rely on crop cultivation are often more vulnerable to shortage of rains and water people who rely on livestock.

Causes and Effects

The data showed that recurrent droughts had both immediate and slow-onset, long-lasting psychosocial impacts. Frequent and massive loss of assets by itself induced psychosocial trauma. Many FGD and KII participants mentioned fear and anxiety about expected droughts. Frequent loss of livestock, the only source of food for these communities, caused acute and chronic food shortages, which led to psychosocial stress related to hunger. Livestock was the only source of livelihood, and it had strong connections with social status and wealth. Loss of wealth and income significantly affected the mental and physical wellbeing of the communities. Recurrent droughts often led to massive displacement and migration, which in turn disrupted families and other social institutions. These disruptions in turn caused stress and depression. Displacement and migration also triggered ethnic conflicts over limited resources as well as crime, which caused psychosocial trauma. Migration and displacement also weakened community networks, leaving community members with less access to social support through relationships and interpersonal transactions that play an important role in psychosocial care. *Governance/Peace/Security, Wealth, Livestock, Infrastructure/Social Services* and *Environment* (e.g., water scarcity and shortage of animal fodder) had significant impacts on *Psychosocial Wellbeing*.

5.1.5. Infrastructure/Social Services

This section discusses the vulnerability of infrastructure and social services to the effects of recurrent droughts in the study communities. Access to road networks, telecommunication and electricity services; timely information on disaster preparedness and weather conditions and access to health services (both human and veterinary), water sources, market services and rehabilitation centers affected the adaptive and coping strategies of the communities. This dimension connects the consequences of weak infrastructure and social services to most other dimensions of this study, including violent conflicts (*Governance/Peace/Security*), poor human health (*Human Capital*) poorer livestock conditions (*Livestock*) and lower productivity, ultimately leading to poverty (*Wealth*).

Adaptive Strategies

Participants perceived access to basic infrastructure such as roads, electricity, information, health and other social services as highly relevant to a better life. Roads were important to give them access to resources and markets in other villages and districts and to help them move to safe places in times of crisis. Road access was a major challenge, particularly during rain.

The Borana defined a better life in terms of ensured cattle health. The mere presence of cattle could not enable people to live a better life; the cattle must be healthy and productive. To this end, fodder and veterinary services were critical. Human health and improved access to water sources were the most frequently mentioned requirements for a better and fulfilled life. Important adaptive strategies were improved access to early warning information and modern technologies (e.g., information dissemination, basic health services, and control of disease outbreaks).

Coping Strategies

The main strategies used by the study communities to cope with the impacts of recurrent droughts on *Infrastructure/Social Services* were dividing or zoning water sources (area enclosure), preserving pastures (*kaloo*) for the hard times and establishing rehabilitation centers by the government and NGOs for emergency support.

Vulnerability Factors

Geographic isolation in terms of infrastructure, communication and other basic social services were the major challenges discussed by the study participants. Lack of access to responsive health services and medicine (both human and animal) and markets were the major challenges related to infrastructure. Participants felt that concerned bodies or sector offices either delayed or denied such services. For example, during data collection, people were worried because their

cattle were dying from an unknown disease for which they got no response from the relevant sector. Lack of access to markets to sell their cattle and purchase basic necessities was another concern raised by some participants. Inability to access markets and get good prices for livestock products was seen as limiting their adaptation to drought and its effects.

Causes and Effects

It was reported that droughts and violent conflicts had adversely affected infrastructure in Borana Zone. Water sources such as traditional wells (*ellas*) had been severely affected by droughts. People had stopped attending schools and going to health centers during droughts because they migrated to other places. Most respondents believed that limited infrastructure such as roads had limited the overall development of the communities. Morbidity and mortality of both humans and livestock were the serious consequences of violent conflicts and lack of basic social services.

In general, the study showed that recurrent droughts led to recurrent violent conflicts and social insecurity, which then led to disruption of families, schools, health centers and other social institutions, in turn leading to poorer human capital development and livestock conditions. The ultimate effect of these disruptions would be weak overall socioeconomic development, reduced wealth and increased poverty.

5.1.6. Environment

This was the dimension most frequently mentioned by study participants. It covers deforestation, climate change, grazing land management, including forage/fodder supply and management, biodiversity, forest/vegetation and land management, water scarcity and water resource management.

Adaptive Strategies

Study participants mentioned enclosure of grazing land (*kaloo*) as one of the Borana communities' strategies to manage the impacts of recurrent droughts on the environment. The communities delineate a grazing land and enclose rangeland to protect the grasses from free grazing. This helps grow grass for animal fodder to use during the season when animal feed is scarce. Establishing private grazing land was another adaptive strategy. Borana communities protect these areas from others so that they can feed only their own livestock, especially lactating cows and calves.

Borana pastoralists clear land of harmful unwanted vegetation to increase their adaptive capacity. Most of the participants complained that their environment was affected by invasive plants. This resulted in the disappearance of endogenous grasses and bushes that had been important animal fodder. To tackle this problem, the local communities began clearing these invasive plants. Prevention of soil erosion and enhancement of forestry were other essential adaptive practices.

To control soil erosion, the communities practiced terracing and planting trees. There adaptive mechanisms were practiced in order to rehabilitate their environment and overcome the effects of recurrent droughts. To avoid unnecessary risk, some pastoralists reduced the number of their cattle. Owning large herds of livestock was a source pride in the Borana pastoralist communities, but their grazing had negative effects on the environment. As a result, the government and NGOs advised and supported the local people to reduce the numbers of their livestock and focus on increasing their quality and productivity.

Water source development and management were mentioned as essential adaptive strategies to overcome water scarcity. The main local water sources (*ellas*) were already affected by recurrent droughts and were becoming the main source of water-borne illnesses. Some study participants explained that to overcome such problems and avoid water shortage in Borana Zone, the government started digging deep wells that could be used for irrigation horticulture and other farming. The participants believed that this water distribution, once it starts, could help solve the critical shortage of water and pasture in the area, though there were other obstacles to adequate water and pasture. Digging ponds and large reservoirs as well as rehabilitating water sources through community efforts were other adaptive mechanisms mentioned.

Coping Strategies

Water conservation using plastic tankers, water saving and water division for different purposes were coping mechanisms during times of drought. The government supplied water during drought seasons. The Borana communities bought animal fodder from places where it was available to save some of their cattle during dry seasons. This was sometimes supported by the government or NGOs, which also provided training on environmental protection. The other coping strategy was purchasing animal fodder. During times of drought, grasses and bushes became too unproductive and scarce to be used as animal feed, and people who could afford it bought animal fodder from other areas to feed their livestock.

Vulnerability Factors

The major vulnerability factors related to environment included the aridity of the environment, shortage of rainfall, high numbers of livestock, deforestation, charcoal making, population pressure, cultural values and individual attitudes that favored large numbers of livestock, and illiteracy. These factors directly or indirectly contributed to environmental degradation and related problems in Borana Zone.

Causes and Effects

Large numbers of cattle, overgrazing, bush encroachment and charcoal had led to depletion of natural resources, which ultimately led to environmental degradation and recurrent droughts. Environmental degradation in turn affected production of animal fodder and livestock, reducing wealth and human capital.

5.1.7. Human Capital

This dimension deals with knowledge, skills, capacity, education and training, school infrastructure including water supply and school feeding, community leadership, introduction and expansion of technologies and capacity building.

Adaptive Strategies

Local social security systems for pastoralist people affected by drought in Borana Zonewere restocking of drought-affected households by clan members in the form of gifts (*busa-gonofa*), providing milk cows to drought-affected households on a temporary basis as an interest-free loan (*dabare*), collecting and redistributing milk to poor households (*busa-konki*) and a traditional mutual support system in which community members get together to help a neighbor with major tasks such as cultivation and construction (*debo*). Some study participants had attended needs-based training provided by the government and NGOs to help them adapt to the effects of recurrent droughts. Livelihood diversification was another adaptive strategy used by the study participants to overcome the effects of recurrent droughts in a sustainable way. Some members of the communities had started building houses in urban areas and renting them, as well as raising camels and goats.

Coping Strategies

The study participants mentioned that the government and some NGOs implemented school feeding programs to minimize the number of school dropouts, provided food aid, established rehabilitation centers, transported water in containers and supplied grass for cattle during times of drought. Such interventions helped the community develop knowledge and experience to cope with the effects of droughts, prepare pasture land enclosure (*kaloo*) for their calves and lactating cows, dig ponds and install water pumps to boreholes to secure water for themselves and their livestock. When drought became severe and caused serious shortage of water and animal fodder, the community members migrated to relatively better places.

Vulnerability Factors

The major vulnerability factors under this dimension are lack of education and the prevailing illiteracy. As shown in the data, lack of education was the most frequently coded vulnerability factor. Most of the study participants claimed that their limited knowledge and skills, along with

a lack of an early warning system, had aggravated the effects of recurrent droughts. Other vulnerability factors mentioned were the value placed on owning a large number of livestock and having many children in the resource-limited environment of the Borana pastoralist communities and the disruption of the local social system. The *gada* system was becoming weaker as a result of frequent droughts and related socioeconomic pressures. The community could hardly exercise the ritual ceremonies because of displacement and lack of cattle. The *buusa-gonofa* social support system, meant to help disaster-affected and disadvantaged families, was not properly functioning because of poverty resulting from recurrent droughts.

Poor infrastructure, weak adoption of technologies and lack of social services were other vulnerability factors. The participants mentioned insufficient healthcare for humans and animals, lack of all-weather roads, geographic isolation and limited access to water sources. On the other hand, they also mentioned that the local communities had failed to accept the extension program designed by the government and were becoming increasingly dependent on food aid. Most of the vulnerability factors were aggravated by poor governance, particularly in terms of land use policy, which could be explained by weaknesses in the contemporary administration, poor sustainability of NGO interventions and lack of empowerment of most vulnerable groups such as women and children. Lack of employment opportunities, particularly for women and young people, was another vulnerability factor mentioned by the study participants.

Causes and Effects

Lack of social services, illiteracy and resource-constraining cultural values led to high population pressure and poverty, which ultimately resulted in psychosocial crises and waste of human capital. These problems were aggravated by gaps and deficiencies in the governance and social support systems.

5.1.8. Governance/Peace/Security

In abroad sense, this dimension comprises activities, processes and frameworks within which political, economic and administrative authority is exercised to manage the various affairs of citizens. It also includes formal and informal mechanisms, processes and institutions through which community members and groups articulate their interests, exercise their legal and human rights, meet their obligations, mediate their differences, negotiate and resolve conflicts and ultimately ensure peace, security and stability. This dimension also comprises such key socioeconomic and political aspects as accountability, transparency, inclusiveness and responsiveness by local and national government bodies to observe and respect the interests of citizens.

Participants in three FGDs and six KIIs discussed conflicts between adjacent districts or *kebeles*, government plans and policies and government and NGO response to drought and its effects under the analytic sub-theme of Lack of Good Governance under the theme of Challenges to Adaptive Mechanisms. In the past, when people in a *kebele* faced drought, they could freely move to another, better place, but this was no longer possible. Many participants thought that their limited mobility during droughts had caused peace and security problems. Wealthier pastoralists with larger herds were supposed to control more land for commercialized pastoralism. The size of rangelands had decreased because of overgrazing, tighter boundary controls and the sale and enclosure of lands for a use such as settled agricultural reserves and conservancy.

This dimension highlights the roles of government and other external bodies, such as NGOs and UN agencies, in promoting good governance and stability; preventing and resolving inter-ethnic clashes and conflicts that lead to loss of human lives and livestock as well as destruction of infrastructure, including the scarce water sources in many parts of Borana Zone; providing relief services; and launching development projects to promote the stability and resilience of Borana pastoralist communities. Other vital socioeconomic and political aspects under this dimension are the need for the government to better delimit borders, fairly distribute water resources, control hostile competition over scarce resources and concomitant conflicts and instability, control inflation, protect infrastructure, provide prompt and consistent support during natural and human-made disasters, facilitate support from NGOs and UN agencies and control corruption.

Adaptive Strategies

The information obtained from FGDs and KIIs revealed no strong adaptive strategies directly related to the dimension of *Governance/Peace/Security*. Local people had developed a limited number of adaptive strategies, such as traditional ways to settle legal disputes, resolve conflicts and ensure peace and security, although these traditional socio-legal and political systems had weakened. The other adaptive strategy was migration to other areas to avoid conflicts and clashes. Some indirect adaptive strategies were mentioned, such as water source development and rehabilitation both by the government (e.g., the Borana Water Network project) and organized communities, communal digging of ponds and wells and enclosure of pasture (*kaloo*) to be used during droughts. All these strategies were expected to contribute directly or indirectly to good governance, peace and security in Borana Zone.

Geographic isolation in terms of infrastructure, communication and other basic services were the major challenges discussed in two FGDs and eight KIIs. Lack of access to health services (both human and animal), markets and roads, were the major adaptive challenges related to infrastructure. Response from concerned bodies or sector offices was felt to be delayed or even denied..

Coping Strategies

The Borana pastoralist communities had few coping mechanisms in the dimension of *Governance/Peace/Security*. One destructive coping mechanism mentioned was clashing over resources or snatching resources controlled by others, applying the rule of survival of the fittest. This often led to bloodshed, loss of human lives and livestock and destruction of infrastructure, leading to further depletion of natural resources, human capital, household and community assets, peace and security and ultimately the resilience of the local communities.

Vulnerability Factors

Factors that made the Borana pastoralist communities vulnerable to shocks and stresses in this dimension included an eroded traditional governance system with weak modern local administration as an emerging substitute; fluid and unclear policy, especially in relation to land use and border delimitations; restricted mobility, even during droughts; and consequent conflicts. Government and NGO interventions were meant to meet short-term, immediate objectives and lacked long-term strategic perspectives and sustainability. Another major vulnerability factor mentioned was corruption, which was reported to be increasing. Lack of empowerment of the most vulnerable groups, such as women and young people, as well as increasing inflation were other major vulnerability factors in Borana Zone.

Causes and Effects

Direct physical destruction of local infrastructure such as household/family assets, schools and health centers had resulted from violent conflicts over limited resources. Water sources such as *ellas* were the most commonly and severely affected infrastructure. Families (as institutions), schools, health centers and other social institutions were left dysfunctional when communities migrated to cope with droughts. A male FGD participant said, *Families move away from their dwelling place because of drought, and children are forced to drop out of schooling.* Another male FGD participant added, *The influence of drought causes schools to be closed, health centers are closed and people are forced to evacuate in search of food and pasture.* Inability to access markets and get appropriate prices for livestock were seen as limiting adaptation to drought and its effects.

The eroded traditional socio-legal and political systems (e.g., *gada*) were closely associated with the decreasing economic assets and deteriorating livelihoods of the Borana pastoralist communities. This was in turn linked to the degradation of the environment and depletion of natural resources. Moreover, lack of long-term development programs spearheaded by the government and NGOs contributed to the prevailing problems in the dimension of *Governance/Peace/Security*. Problems in these areas could adversely affect the psychosocial state of the local communities, human capital and the environment.

CHAPTER SIX: CONTEXT-SPECIFIC RESILIENCE FRAMEWORK

Based on the findings of the literature review, FGDs and KIIs, the research team developed a context-specific analytical resilience framework for recurrent droughts and identified entry points for potential innovative solutions (figure 3). The framework helped conceptualize the cause-and-effect chain between dimensions and inclusion of the different entry points.

Figure 3: Resilience Framework for Borana Zone, Ethiopia

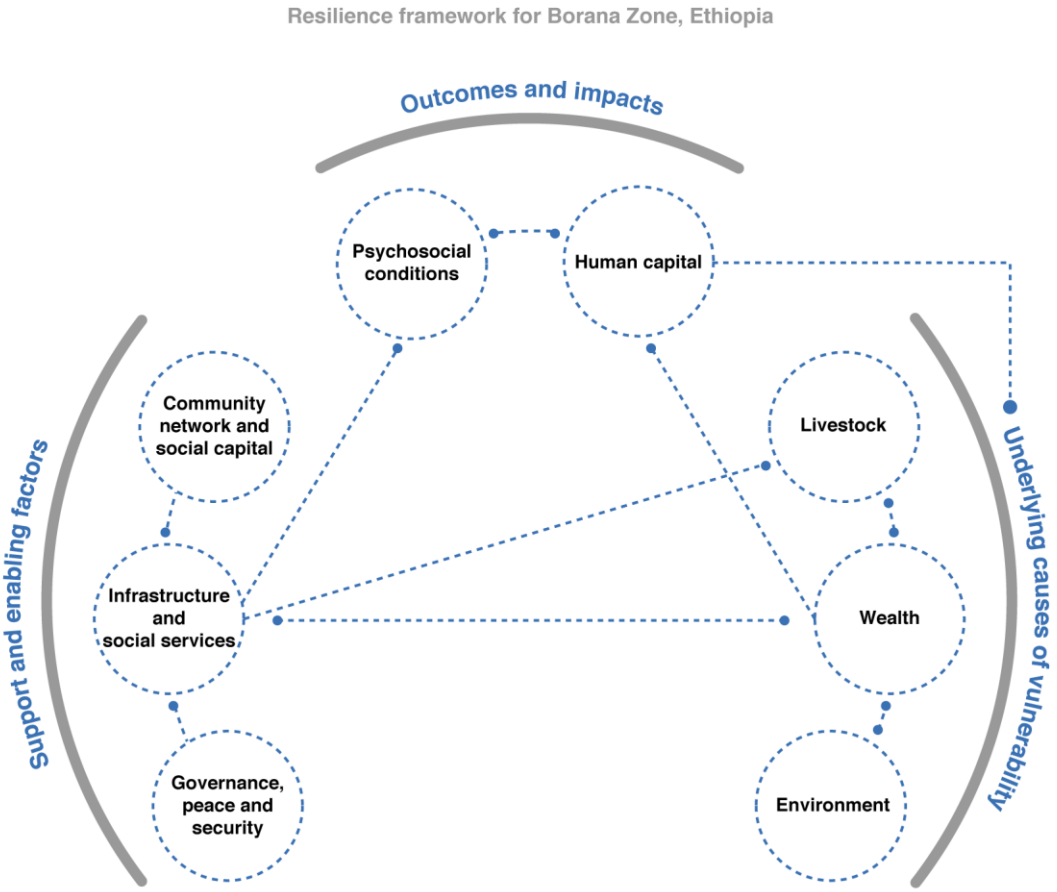
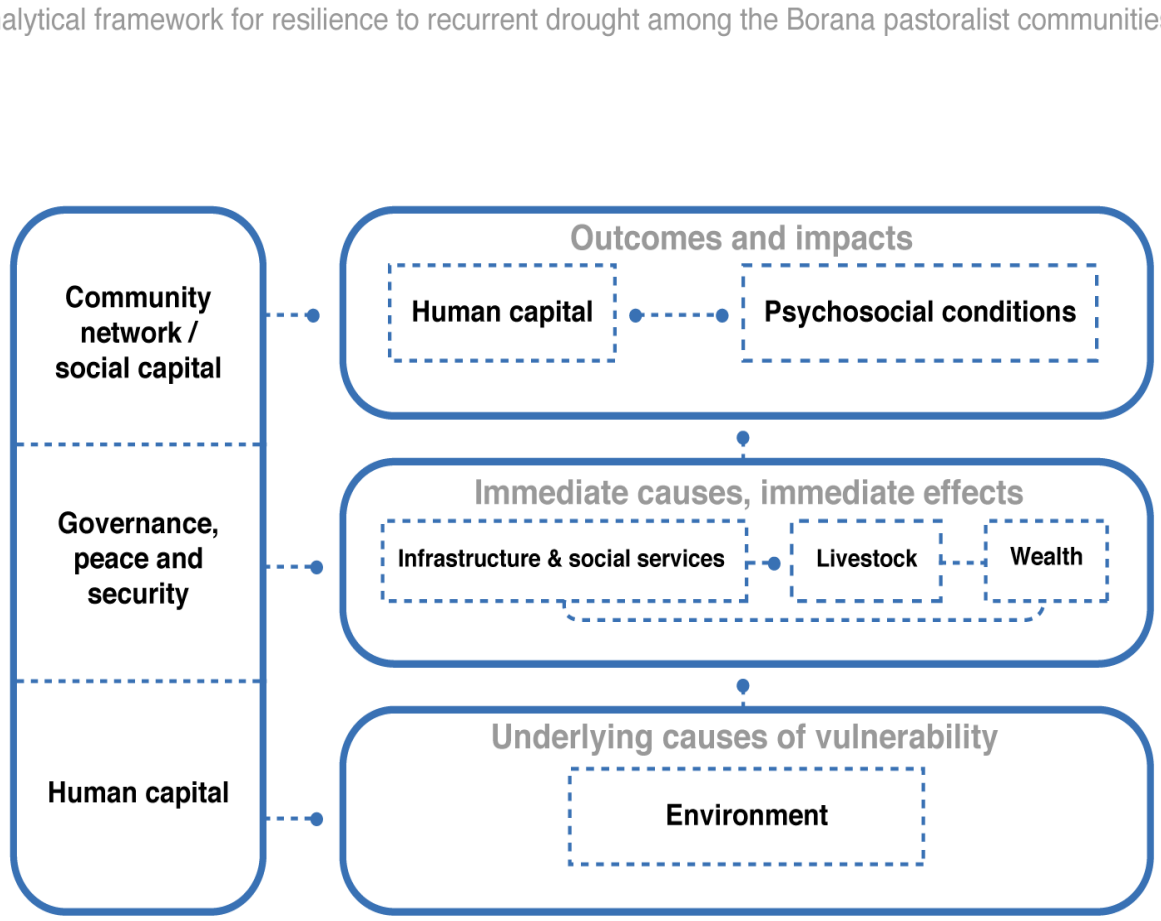


Figure 4. Analytical Framework for Resilience to Recurrent Droughts among the Borana Pastoralist Communities



This framework presents context-specific resilience to recurrent droughts among Borana pastoralists in Southern Ethiopia. The diagram shows that environmental factors such as climate change, aridity, land degradation, deforestation, water scarcity, invasive plants and overgrazing were the root causes of recurrent droughts in the area and an underlying cause of vulnerability to these hazards.

There is a bidirectional link between the *environment* and *livestock* dimensions. On the one hand, many FGD participants and key informants indicated that the degraded environment had adversely affected livestock production, while on the other, they said that a large livestock population had contributed to further deterioration of the environment. The dimensions of *Livestock*, *Wealth* and *Infrastructure/Social Services* were related to the immediate effects of recurrent droughts, but *Governance*/*Peace/Security* was immediately and conceptually related to *Infrastructure/Social Services*, which then affected *Livestock* and *Wealth*. The *Wealth* and *Livestock* dimensions were highly related, as livestock production is the predominant livelihood and source of wealth among the Borana pastoralists. *Psychosocial Wellbeing* and *Human Capital* were related more to the eventual outcomes of recurrent droughts, as they constituted the impacts of gradual onset of stress, depression and frustration from loss of livestock and wealth and anxiety caused by expected drought episodes and resultant displacements, conflicts, insecurity instability and poverty.

On the other hand, *Social Capital/Community Networks* was more related to adaptive and coping mechanisms, as it dealt mainly with indigenous and traditional support systems in the forms of asset redistribution and restocking. Similarly, *Governance/Peace/Security* was related to supportive and enabling factors to help the Borana pastoralists develop resilience to recurrent droughts.

Co-occurrence of Dimensions

The co-occurrences of resilience dimensions and analytical factors greatly influenced the shape of the contextual resilience framework; they determined the leveling of the dimensions. The dimension-by-dimension co-occurrence frequencies determined how closely the dimensions were related. Moreover, the qualitative facts influenced the leveling of the dimensions and the state of the links between them (tables 4 and 5).

Table 4: Dimension by Analytical Factors Co-occurrence (percentages)

Dimensions	Effects	Fulfilled life	Suggested adaptive capacity	Vulnerability factors	Adaptive mechanisms	Cause	Coping mechanisms	Immediate causes	Immediate effects	TOTAL
Social Capital/ Community Networks	1.3%	9.0%	0	16.7%	35.9%	0	35.9%	0	1.3%	78
Environment	15.7%	5.7%	4.7%	2.7%	7.0%	32.6%	2.2%	8.9%	20.6%	598
Governance, Peace/Security	17.8%	2.5%	1.6%	49.6%	7.6%	5.0%	11.3%	0	4.5%	793
Human Capital	47.6%	9.0%	11.2%	14.6%	8.2%	2.4%	2.1%	0	4.8%	376
Infrastructure/ Social Services	17.0%	6.0%	4.5%	41.4%	11.2%	1.2%	4.9%	0	13.9%	823
Livestock	4.2%	8.2%	5.7%	30.2%	18.3%	2.4%	9.5%	0	21.5%	758
Psychosocial Wellbeing	31.6%	20.4%	0.3%	25.4%	2.9%	1.1%	6.0%	0.4%	11.8%	890
Wealth	17.5%	8.3%	3.9%	35.4%	8.4%	0.1%	9.7%	0	16.7%	1181

Table 5: Dimension by Dimension Co-occurrence (percentages)

Dimensions	Social Capital/ Community Networks	Environment	Governance/ Peace/Security	Human Capital	Infrastructure/ Social Services	Livestock	Psychosocial Wellbeing	Wealth	TOTAL
Social Capital/ Community networks		0	7.8%	2.0%	2.0%	35.3%	35.3%	17.6%	51
Environment	0		3.1%	6.2%	38.9%	32.0%	15.7%	4.1%	388
Governance/Peace/ Security	0.4%	1.2%		1.1%	23.1%	16.5%	29.8%	27.9%	1,034
Human Capital	0.3%	6.3%	2.9%		39.7%	13.2%	14.6%	23.0%	378
Infrastructure/ Social Services	0.1%	11.2%	17.8%	11.1%		19.5%	19.6%	20.7%	1,346
Livestock	1.5%	10.4%	14.3%	4.2%	22.0%		17.9%	29.7%	1,195
Psychosocial Wellbeing	1.3%	4.3%	21.7%	3.9%	18.6%	15.1%		35.1%	1,417
Wealth	0.6%	1.0%	18.9%	5.7%	18.2%	23.2%	32.5%		1,531

CHAPTER SEVEN: INTERVENTION ENTRY POINTS

The catastrophic effects of recurrent drought, livestock losses and mass migration of pastoralists could be averted by timely and appropriate interventions. The context-specific analytic framework was used to identify the best dimensions for interventions that would have a positive impact on overall resilience. The process was informed by the dimension descriptions, the levels/locations of the dimensions on the resilience framework and the linkages (cause/effect chain) between the entry point dimension and other dimensions. These findings have indicated potential entry points for designing, incubating, testing and scaling up innovations to help the communities in Borana Zone capitalize on their endogenous knowledge, linked to scientific methods as appropriate, to adapt to the effects of recurrent droughts.

7.1. Infrastructure/Social Services

Analysis of the data and the framework of recurrent droughts in the study area showed that this dimension cut across most of the others, either affected by or affecting them. For example, *Governance/Peace/Security* affects schooling and provision of information. The ultimate effects on *Infrastructure/Social Services* such as schools are further linked to adverse consequences for *human capital*. This is consistent with the identification of the livelihood diversification intervention pathway during the Intervention Strategy Workshop (ISW) conducted in July 2014, in Addis Ababa. Another example is the possible link of *Infrastructure/Social Services* with the dimensions of *Livestock*, *Human Capital* and *Wealth* in terms of nonresponsive health services (both veterinary and human).

Violent conflicts resulting from hostile competition over scarce natural resources in the *Governance/Peace/Security* dimension fueled the adverse consequences of recurrent droughts on *Infrastructure/Social Services* by preventing or restricting mobility and thereby limiting access to water sources and rehabilitation centers. Limited access to timely information further substantiated the relationship between this dimension and *Governance/Peace/Security*.

Destruction and closing of schools following violent conflicts has direct and long-term consequences for *human capital*. On the other hand, poor coverage and management of both human and veterinary health service characterized by non-responsive service delivery have direct consequences on *Human Capital*, *Livestock* and *Wealth*. Thus, the RAN project could consider one or more of the above dimensions as potential entry points for designing, incubating, testing and scaling up innovations. If water source development and management interventions are considered as entry points, the possibility of duplication of effort needs to be considered, as there are similar government and NGO interventions in the area (e.g., the government Borana Water Network).

Limited access to road networks and telecommunication and electricity services were the most frequently reported vulnerability factors in this study, illustrating the relationship between *Infrastructure/Social Services*, *Wealth* and *Human Capital*. However, interventions in these areas may not be feasible in terms of cost, time and policy/politics. Therefore, the *Infrastructure/Social Services* dimension should be prioritized for interested partners or implementers to select interventions. This does not mean that RAN should address all aspects discussed in this dimension. As RAN promotes partnerships and resource multiplication, the results of this study could be used by other implementers of resilience programming in the study area.

As livestock is the main source of food and income for the Borana pastoralists, loss of livestock caused acute and chronic food insecurity, leading to malnutrition and other related diseases, especially among children. This indicates the need for targeted interventions for vulnerable groups, such as children, the elderly and women. However, interventions focusing on the health sector alone with a disease-centered approach (as opposed to a systems approach) are not a strategic solution to the problem without involving other relevant development sectors such as agriculture. This may create complexities in running the project.

Scarce social services, particularly education and health information, have increased population pressure, resulting in environmental degradation, waste of human capital and ultimately poverty. As these problems were aggravated by gaps in the governance and social support systems, improving access to and utilization of family planning services while supporting/strengthening the district health system, particularly building capacity for leadership and governance, are potential entry points.

Destruction of infrastructure and disruption of livelihood and family life affected the psychosocial wellbeing of some Borana pastoralists, causing stress and depression. Poor psychosocial conditions also led to crime and unhealthy behaviors such as chewing khat and drinking alcohol, indicating the need to design, pre-test and implement culturally appropriate social and behavior change communication (SBCC) materials to discourage these behaviors and promote mental health in general. Evidence-based policy dialogue could be used as an entry point to integrate interventions targeted at these behaviors into Ethiopia's flagship Health Services Extension Program (HSEP) implemented in rural *kebeles*. Mental health promotion is only part of urban HSEP packages.

7.2. Social Capital/Community Networks

This dimension supported or enabled the *Infrastructure/Social Services*, *Livestock* and *Wealth* dimensions. Endogenous knowledge of forecasting drought, for example, using wind direction, helped communities prepare for disaster to some extent. Innovations could be designed and implemented to help communities capitalize on this endogenous knowledge, with links to scientific methods as appropriate, to adapt to the effects of recurrent droughts.

The study has found that community networks as well as traditional social and legal support systems were crucial in improving resilience to droughts. *Gada* and *busa gonofa* helped people share their resources and manage conflicts. Communities have used pooled resources to develop and maintain water sources. However, unwillingness to share resources is reportedly eroding and weakening these systems. Social capital should be seen as a key aspect of the local capacities that need to be strengthened. RAN could consider innovations to save this crucial social capital from further deterioration, maintaining and promoting or transforming it to maximize its contribution to local development. Transforming such culturally sensitive values requires careful design.

The values and attitudes prevailing in the communities, including a preference for owning large herds of cattle (people like to rear cattle, but not to sell or feed on their meat), traditional or less diversified lifestyles and dependence on external aid during crises were reported challenges to the Borana pastoralists' adaptive capacities. The dependency created by emergency relief provided by the government and NGOs was seen as a major threat to resilience because it weakened the cultural social network or social capital.

Evidence-based policy dialogue could be generated to challenge current practices in support of innovative approaches that facilitate or promote community engagement. Integrating psychosocial health care with the current rural HSEP packages could also be considered. Culturally appropriate SBCC materials could be designed, pre-tested and developed to discourage the unfavorable attitudes, beliefs and values discussed earlier.

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