Rangeland Management for Improved Pastoralist Livelihoods

The Borana of Southern Ethiopia

By

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Borana herder grazing cattle Photograph D. Skinner

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Abstract

Pastoralism, a livelihood system based on animal herding, has endured for centuries as a rational adaptation to often harsh and erratic grassland environments. Founded on mobility and flexibility, the pastoral system optimises the use of natural resources to maintain the livestock on which pastoralists depend for their well-being. As seen in the case of the Borana pastoralists of southern Ethiopia, however, various pressures, including poor policies, agricultural encroachment, population pressure and land degradation are now undermining the resilience of the system and of the natural resource base. Various strategies are being employed by NGOs to support the livelihoods of pastoralists in Borana. Since livestock is the mainstay of Borana livelihoods, a vital component of any intervention activity is to improve the condition of, and with it access to, the grasslands so that livestock can be maintained.

This dissertation begins by examining the pressures causing vulnerability amongst the Borana pastoralists of southern Ethiopia with specific emphasis on factors affecting the integrity of the rangeland management system. The livelihoods approach used in the paper helps to assess the importance of healthy rangelands for building assets and sustainable pastoralist livelihoods.

This analysis begs the question of what can be done to revitalise the degraded rangelands of Borana. The author therefore analyses the key rangeland management techniques being employed by NGOs to rejuvenate this natural resource base and assesses their strengths and weaknesses in order to recommend a way forward. The paper suggests that indigenous knowledge and skills can serve as a useful guide for managing the rangelands while at the same time enabling the Borana pastoralist community to engage with and take ownership of this development assistance and support.

Acknowledgements

A big thank you goes to Charles Hopkins at the Pastoral Program Coordination Unit of CARE, Ethiopia who realized my ambition to work with pastoralists in East Africa. He, along with my other colleagues at the unit, were a wealth of knowledge and experience and helped me get stuck into rangeland management issues from the moment I set foot in Ethiopia. Richard Hatfield and Craig Leggett were invaluable sources of wisdom and I am indebted to them for all they taught me about rangeland ecology and holistic thinking while strolling across the dry grasslands of Borana or banging down dirt tracks in 4x4s.

I am grateful to David Sanderson, my supervisor, who was positive and encouraging and patiently read through huge chunks of material giving advice and comments along the way. A special thanks goes to him also for introducing me to the realm of international development.

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Last but not least, I thank the Borana people for sharing their knowledge and teaching me so much about the traditions and challenges of pastoralist life.

Many thanks to all!

Acronyms

ASALs	Arid and Semi-Arid Lands
ACDI/VOCA	Agricultural Cooperative Development International/Volunteers in Overseas Cooperative Assistance
AU/IBAR	African Union/Inter-African Bureau for Animal Resources
CGIAR	Consultative Group on International Agricultural Research
ELMT/ELSE	Enhanced Livelihoods in the Mandera Triangle/Enhanced Livelihoods in Southern Ethiopia (project)
EPRDG	Ethiopian People's Revolutionary Democratic Front
FAO	Food and Agricultural Organization
GOE	Government of Ethiopia
HM	Holistic Management
HPG	Humanitarian Policy Group
IIED	International Institute for Environment and Development
IUCN	International Union for the Conservation of Nature
NGO	Non-Governmental Organization
NRM	Natural Resource Management
PA	Pastoral Association
PAR	Pressure and Release (model)
PARIMA	Pastoral Risk Management Project
PIPs	Policies, Institutions and Processes
PPCU	Pastoral Program Coordination Unit
RAL	Resilience and Livelihoods (model)
RREAD	Regional Resilience Enhancement Against Drought
SCUS	Save the Children/US
SORDU	Southern Rangelands Development Unit
UNDESA	United Nations Department of Economic and Social Affairs
USAID	United States Agency for International Development
WISP	World Initiative on Sustainable Pastoralism

Terminology

Abba dheeda	Headman for the common seasonal grazing area
Abba heerega	Delegate for water management
Buusa gonofa	Wealth redistribution system following drought
Dheeda	Common grazing area
Forra	Remote grazing from settlements
Gana	Long rainy season
Hagaya	Short rainy season
Hayu	Mediator for well usage
Jaarsa ardaa	Area level committee
Jaarsa dheeda	Body of male elders in charge of common grazing
Jaarsa maada	Body of male elders in charge of the area relating to a permanent water source
Jaarsa reera	Village cluster committee
Kallo	Grazing reserve set aside for calves and weak animals
Kebele	Sub-district administration unit, term now largely used instead of PA
Khat	A leafy stimulant
Matagudeesa	Grass type (*cenchrus ciliaris*)
Reera	Group of villages
Tuula	Traditional deep wells
Warra	Grazing close to settlements

Contents

List of figures and tables

Figures

Tables

Chapter 1 – Introduction

1.1 General Background

Pastoralism is a livelihood which is extensively followed across the world. It supports 20 million households and roughly 240 million individuals, being practiced in 25% of the globe and providing 10% of the world's meat production (FAO, 2001; Nori *et al.*, 2008). Pastoralism involves the extensive use of grasslands for livestock production and is one of the key production systems in drylands (FAO, 2001).

In East Africa these drylands, specifically Arid and Semi-Arid Lands (ASALs), cover huge areas which account for 60-100% of the land cover of Ethiopia, Uganda, Kenya, Sudan, Somalia and Djibouti (FAO, 2008). Experts increasingly agree that these eco-systems are best suited to the pastoralist way of life (see Scoones, 1995; Oba, 1998; Homann, 2004a; Brooks, 2006), which after all has evolved and existed successfully in these landscapes for centuries. The economy of the ASALs in East Africa is mainly based on animal herding which operates in an environment of patchy resources, unpredictable climatic patterns and temporal rainfall, which demands flexibility of movement. It is often this very flexibility which is a root cause of the political, social and economic margalisation which pastoralists find themselves in today.

In the rural context it is important that pastoralism is weighed up as a valid and appropriate adaptation to difficult environments, and that the contributions it makes can be seen to benefit pastoralists as well as local, national and even global populations. In the context of rural poverty especially, it is worth considering how rural landscapes can be used to their economic advantage and this means that optimum land uses have to be considered. Pastoralism may often be better suited to ASALs than is crop agriculture, for example. In the least developed countries, Ethiopia included, a steady increase is predicted for rural populations, in the foreseeable future, with figures rising from over 609, 000 today to over 730, 000 by 2025 (UNDESA, 2007). In this scenario it is important that we work towards establishing long-term, sustainable livelihoods in the rural context now. Moreover, by supporting sustainable rural livelihoods NGOs and governments will also relieve the strains

on urban centres which also foresee burgeoning populations in the next decade, not least because of rural migration[1].

Pastoralism has been subjected to multiple pressures which have undermined its resiliency as a way of life. Given the right incentives and support, however, it could prove to be an even more productive and valuable aspect of rural livelihoods, not least of all because so many people depend on it for their sustenance. In Ethiopia the 8 to 9 million pastoralists (ACDI/VOCA, 2008) of an estimated national population of 70.7 million (World Bank, 2008), harbour Africa's largest livestock population. Pastoralism is a cultural and economic system that determines and is determined by social structure, resource management, productivity, trade and social and welfare mechanisms in communities founded on livestock rearing as a primary economic activity (Nori *et al.*, 2008).

Recognising this, non-governmental organisations (NGOs), amongst other actors, have attempted to support pastoralists in Ethiopia in various ways from improving animal and human health, supporting and introducing diversification activities (often based on rangeland resources), creating and strengthening access to markets, natural resource access (such as water access), strenghthening traditional institutions and improving rangeland management.

1.2 Problem analysis

'In the past decades, the loss in access to land for pastoralists has been greater than for almost any other resource users, seriously compromising their livelihood option'

Bruce H. Moore, Director International Land Coalition

The defining characteristic of pastoralists is their dependence on domestic grazing animals (Homewood, 2008). Most economic definitions of pastoralism refer to Swift's 1988 definition that pastoral production systems are those, 'in which 50% of the gross incomes from households. . . come from pastoralism or its related activities, or else, where more than 15% of households' food energy consumption involves the milk or dairy products they produce' (Swift, 1988; cited in Hatfield and Davies, 2006). Thus, the key tangible asset for pastoralists is livestock. And the 'basic need' for livestock is pasture. Yet loss of pasture for grazing is one of the main stresses which pastoralists face across the Horn of Africa.

[1] Note that many also argue that urbanisation is a good thing, providing greater opportunities, and greater income for remittances to rural areas, etc.

According to the Enhanced Livelihoods in Southern Ethiopia project (part of USAID's broader Regional Enhanced Livelihoods in Pastoral Areas Programme), livelihoods for the Borana pastoralists of southern Ethiopia are under threat from repeated cycles of drought as well as other drivers of change, and marginalisation from political and economic processes (ELMT/ELSE, 2008). The Borana are, moreover, an example of a pastoralist group whose grassland resources are dwindling. Historically the Borana pastoralists were accustomed to 100,000km^2 of prime grazing land where access was accorded through carefully regulated social norms and mobility ensured the recuperation of grazed lands as well as constant access to fresh fodder.

Fig 1: The Borana Zone in Ethiopia – home to the Borana pastoralists and area of study (Source: UNOCHA with modifications by the author)

Today the Borana operate over a circumscribed area of increasingly degraded rangeland now suffering from increasing bush encroachment. The rangelands are shrinking through various factors including population growth, agricultural encroachment, land degradation, blocked migration routes and conflict triggered amongst others by scarce natural resources. Smaller grazing areas mean that the Borana pastoralists are slowly having to abandon the customary, ecologically balanced management system which reduced risk by operating over a large area and gave grasslands time to recover. Therefore development interventions which can assist the Borana to reverse the process of degradation and which aim to re-establish healthy grasslands are one of the valuable strategies used to improve the self-reliance, resiliency and livelihoods of the Borana population.

1.3 Aims and objectives of the dissertation

Aims:

- To explore the value of rangelands for pastoralist livelihoods in the Borana region and investigate management techniques which counteract their increasing degradation.

Objectives:

- Identify factors causing pastoralist vulnerability today,
- Explore the concept of pastoralism as an adaptation mechanism to harsh environments that provides important services to pastoralists and non-pastoralists alike,
- Describe pastoralist livelihoods in Borana and highlight rangelands as the foundation,
- Demonstrate how rangelands were traditionally managed,
- Delineate approaches to rangeland management, the pros and cons, and provide recommendations for successful rangeland management.

1.4 Scope, focus and limitations

As mentioned above, the issue of degraded rangelands is encountered by pastoralists across much of East Africa. For the purposes of this study, however, I have chosen to focus on the

Borana pastoralists of southern Ethiopia and how this phenomenon impacts them specifically and what can be done about it. The reason for this is twofold.

Firstly, within the limitations of a Masters degree, a case study allows for a more detailed and in depth consideration of a pastoralist focus group. It allows us to look at how one particular group have traditionally managed their rangelands as well as their livelihoods profile. It also means that we can look at what specific techniques have been used to revitalise grasslands in the region and what works within that ecological setting. Furthermore, case studies are to a large extent useful for providing transferable lessons which can then be applied to similar cases in other geographical settings.

Secondly, I was in Ethiopia over the summer working specifically on natural resource management issues at the Pastoral Program Coordination Unit (PPCU) of CARE. My work focused on the Borana pastoralists and I was keen to draw on the direct knowledge I gained from this experience for my dissertation.

When rangeland management is addressed by NGOs in Ethiopia it is often in tandem with other natural resource management issues, and alongside policy, institutions and processes (PIP) considerations such as strengthening customary institutions. This dissertation, however, will be focusing specifically on grassland rejuvenation as one means towards improving livelihoods.

I was in the Borana region twice for 12 days in total during the months of July and September of 2009 and used the opportunity to conduct interviews with Borana pastoralists on the subject of rangeland management, traditional practices and their impressions of NGO rangeland management techniques. However, these interviews had to be kept fairly short and to the point as they were tied in with accompanying consultants, for whom other duties were primary. Since I did not stay in the pastoralist villages during these trips, but in the nearest town of Yabello, accessessing the villages was dependent on logistics at the CARE field office which co-ordinated travel. Moreover, the interviews themselves were conducted with the help of a translator which meant that I was not privy to the full responses given by interviewees. So often what sounded like long, measured responses were translated for me into one summarising sentence, and it was difficult to subsequently assertain the fuller details of the response.

1.5 Organization of the Study

The dissertation sets the context of pastoralist vulnerabilities and livelihoods in Borana, highlights the importance of rangelands for livelihoods and consequently the measures being implemented to improve the condition of rangelands over six chapters.

The first chapter introduces pastoralism generally, and in Borana specifically, while drawing attention to some of the inherent characteristics of pastoralism as well as factors which are making this livelihood increasingly vulnerable. The aims and objectives are also laid out to pinpoint topics being covered by the dissertation. The focus of the study and constraints on the author in addressing this topic are discussed in order to present a transparent understanding of the basis of research.

Chapter Two explains the methodological approach used and the key concepts and models implemented to facilitate an analysis of the vulnerabilities faced by pastoralists and their livelihood basis. The Pressure and Release (PAR) and Resilience and Livelihoods (RAL) models are introduced so that the concepts they embody, and strengths, can be understood prior to their more tailored application to the context of Borana pastoralism.

In Chapter Three the traditional resilience and the value of the Borana pastoralist system are discussed prior to an investigation of the reasons for which pastoralists find themselves in a downward spiral of vulnerability in today's Ethiopia. The PAR model is used to provide a comprehensive overview, as well as show that the causes of vulnerability are manifold and more specifically how outside forces have shaped access to and condition of the rangelands, often to the detriment of Borana livelihoods.

The fourth chapter provides an overview of the livelihoods of Borana pastoralists using the RAL model. This serves to highlight how pastoralism is a livelihoods strategy founded on animal husbandry and that animals depend on rangelands for fodder. Although, the Borana people do engage in other livelihoods activities, it will be seen that animals remain the mainstay of their livelihoods security.

Since the previous chapters have drawn out the importance of rangelands as a foundation for Borana livelihoods and a vital asset responsible for resilience, the question is what can be done to revitalise these rangelands. Chapter five addresses this issue by examining approaches to rangeland rejuvenation in Borana and weighing up some of the pros and cons.

The concluding Chapter Six summarizes the main topics of this dissertation making some recommendations along the way.

Chapter 2 – Methodology

As indicated by the aims and objectives above, this dissertation is essentially trying to determine the effectiveness of rangeland management techniques in improving livelihoods in the Borana region of southern Ethiopia. The author has used an approach which considers indigenous knowledge as useful to the successful implementation of any development, and in this context, rangeland management intervention. This thinking follows the proposition of Horak (2005) who points out that indigenous knowledge is the basis for local-level decision-making from health care to natural resource management, that it provides problem solving strategies for communities, that it is community-driven rather than individual, and that it can contribute significantly to development when, leveraged with other knowledge resources (*ibid.*). Moreover, there is a growing consensus that knowledge transfer should be a 'two-way street' (World Bank, 1998). The indigenous knowledge approach seems relevant not only on a personal note, as it is in keeping with my training as a social anthropologist, but it is also in concert with Chambers' ongoing theme that local people have great capability (see for example Chambers, 1997). Furthermore, the recognition of indigenous knowledge means empowerment for beneficiaries of any development intervention as this is one way in which people experience ownership. On a more practical level, there are useful lessons which can be drawn from indigenous knowledge. In the past, thinking which ignored indigenous knowledge was not always successful and in cases caused unnecessary damage to livelihoods.

I have incorporated indigenous knowledge considerations into this disseration by addressing the topics of 'pastoralism as a good adaptation to drylands' and 'traditional rangeland management' respectively. Research for these sections involved the 'armchair'[2] approach of consulting relevant literature, and fieldwork which consisted of interviews with elders of the Borana clan as a means of verifying and padding out the literature.

My approach is also livelihoods-based. This helps us to understand the, 'people, their capabilities and their means of living, including food, income and assets. . .' (Chambers and Conway, 1991, abstract). It thus helps to draw out the importance of healthy rangelands - a

[2] Term used in social anthropology for research which is desk-based

vital physical asset for pastoralists. As Chambers and Conway highlight, 'a livelihood is environmentally sustainable when it maintains or enhances the local . . . assets on which livelihoods depend. . .' (*ibid.*, abstract). And the security and sustainability of Borana livelihoods depends inextricably on their environment. I use the livelihoods framework developed by Sanderson (2009) to illustrate these points.

Underlying the question of livelihoods security is the issue of vulnerability. How is it that a livelihoods system that was relatively resilient in the past is now increasingly vulnerable? Vulnerability has many dimensions: economic, social, demographic, political and psychological (Twigg, 2001). A further dimension is climatic. Drought, for example, is a natural hazard which pastoralists took into account in their livelihoods strategies. With increasing vulnerability, however, it could now threaten as a natural disaster. This dissertation does not focus specifically on vulnerability to disasters, but rather on the various forces which have caused the marginalisation of pastoralism in Ethiopia and made it an insecure and volatile livelihoods option. In the process these forces have increased its vulnerability to climatic conditions.

The chapter on 'Pastoralism under Pressure' explores the causes underlying pastoralist vulnerability in Ethiopia using an adaptation of Blaikie *et al.'s* Pressure and Release Model. Rather than taking disaster/hazard vulnerability as the starting point and viewing livelihoods as an aspect, however, I am taking 'undermined livelihoods' as the starting point. The model is useful in disentangling the root causes, ongoing conditions, and 'unsafe conditions' of vulnerability and thus for assessing the relative contribution of degraded rangelands to undermining pastoralist livelihoods.

The research for the dissertation involved desk-based research as well as fieldwork. The author was keen to gain hands-on, practical experience in development projects which focused on dryland livelihoods and natural resource management where possible. During the spring of 2009 she contacted different NGOs who worked on pastoralism in the Horn of Africa and was delighted to be offered an internship opportunity with the Pastoral Program Co-ordination Unit at the NGO CARE Ethiopia in Addis Ababa for three months. The theme of this dissertation has been informed by this opportunity and material, particularly on rangeland management strategies, was gathered in the course of her work there.

2.1 Research

The content of this dissertation is based on a variety of sources as detailed below.

1) Desk research

A large number of primary and secondary sources were consulted. They include reports, documents, and project and grey literature produced by NGOs (including CARE, Oxfam, Save the Children, SOS Sahel), International Organizations (such as the UN, IIED and IUCN) and projects, such as the Enhanced Livelihoods in the Mandera Triangle/Enhanced Livelihoods in Southern Ethiopia (ELMT/ELSE) project. Literature produced by independent research groups such as HPG, was also of great value as was academic literature which covered ecological, anthropological and regionally-relevant subjects.

1) Fieldwork

Fieldwork consisted of interviews with the Borana pastoralists, interviews with NGO staff in Addis Ababa and participatory observation of work conducted with the community by holistic management experts.

Interviews with NGOs were carried out under the auspices of my work with CARE Ethiopia and although the focus was on illiciting information for research conducted for the PPCU, aspects of these interviews were also highly relevant to the topic of this dissertation. Where relevant, therefore, this information has been used in the thesis. The interviews were conducted with NGO officers who had worked on or had specific knowledge about natural resource management techniques.

Research in the Borana region was conducted in two villages – Guyo Jattani of the Dikale Pastoral Association (PA)[3], and Malise Boru of the Dambala Dhibayu PA. The research involved semi-structured interviews with herders and elders and focus group discussions with elders. In order to learn more about traditional rangeland management, the author targeted the elders who through virtue of their age and experience had good knowledge of earlier systems. The elders, one *abba dheeda*[4]

[3] PA also refers to Peasant Association and equates *Kebele* – the smallest administrative unit in Ethiopia.
[4] In the Borana system individuals take on different leadership responsibilities. The *abba dheeda* is the headman for a grazing area used by the community throughout the year.

and a herder were furthermore consulted on their opinions of NGO-led rangeland management techniques. However, the material here is scanty due to time constraints on the author.

Whilst working with holistic management experts in Borana I was privy to focus group discussions and PRA techniques about rangeland use. The consultants, Richard Hatfield and Craig Leggett, taught me a great deal about rangeland ecosystems, different management techniques and specifically holistic management. I have drawn on what I learned during these discussions from pastoralists, and from Richard and Craig, for the dissertation.

2.2 Analytical Tools

To be able to understand the livelihoods of Borana pastoralists, it is necessary to take into account the key factors which influence their lives and well-being. The following two models offer a comprehensive way of gaining such understanding. Furthermore, they allow for an examination of pastoralists' vulnerability, taken here to mean, 'the inability of communities or households to cope with contingencies and stresses to which they are exposed' (Trench *et al.*, 2007, cited in Catley and Watson, 2008, p.1).

The dissertation firstly uses the Pressure and Release (PAR) model developed by Blaikie *et al.* (1994) in order to examine the pressures under which pastoralism finds itself today. The model was chosen as it is a particularly useful tool for a vulnerability analysis which it does by layering the analysis to look at the surface to underlying factors causing vulnerability. It thus allows for an in-depth study of vulnerability amongst Borana pastoralists. Understanding this is key to explaining how the Borana find themselves in the marginalised position they are in today and to identifying which aspects of their livelihoods have been undermined and how. This can help us to understand the elements of their livelihoods which could be supported in order to improve 'capacity', 'resilience', and 'sustainability'.[5]

The second model used looks at the complexity of pastoral life. This is the Resilience and Livelihoods (RAL) model developed by Sanderson (2009). The model breaks livelihoods

[5] 'Capacity' and 'resilience' are seen as the converse of 'vulnerability' by Sanderson (2009) and Pavanello (2009) respectively. UNDP describes 'vulnerability' and 'sustainability' in the livelihoods context as at two ends of a spectrum (Twigg, 2001, p. 14).

complexity down into a number of components including people, their basic needs, the resources they depend on, access or lack of access to these resources, the assets they control, governance issues and the shocks and stresses which undermine their livelihoods security. It provides a 'description of livelihoods that is readily understandable', as well as an 'explicit inclusion of assets as a means to reduce vulnerability' (Sanderson, 2009, p.51). For the purposes of this dissertation, the model helps to situate rangelands in the framework of pastoralist livelihoods and to specifically examine the place of natural resource use for Borana pastoralists.

Thus the PAR model will analyse vulnerabilities and the RAL model will be used to describe how livelihoods operate with a particular focus on natural resource use. The author believes that together the two models will serve to highlight pastoralist vulnerabilities and crucial elements of pastoralist livelihoods.

2.2.1 The Pressure and Release (PAR) Model

The PAR model recognises that a disaster is the 'intersection of two opposing forces: the processes generating vulnerability on one side, and physical exposure to hazard on the other', or sometimes a slowly unfolding natural process (Twigg, 2001, p.4; Wisner *et al.*, 2004, p.50). Vulnerability has to be reduced in order to relieve the pressure which can come from either side of this model.

The PAR Model is used in chapter 3 to look at the factors which have undermined pastoralists' livelihoods in Borana and caused the marginalisation and vulnerability which pastoralists now struggle with. This model is constructed in a way which allows one to question the underlying causes of their situation as it prompts the question 'Why?' to the causes of a disaster (Sanderson, 2009, p. 13). Vulnerability is seen to progress with three main levels:

1) Root causes: These are the underlying causes and the most remote influences. They can be economic, demographic and political processes within society;

2) Dynamic pressures: These develop out of root causes into specific types of insecurity experienced in relation to the types of hazards faced by vulnerable people;

3) Unsafe conditions: The immediate manifestations of vulnerability (Twigg, 2001, p.4-5; Wisner, 2004, p.52-6).

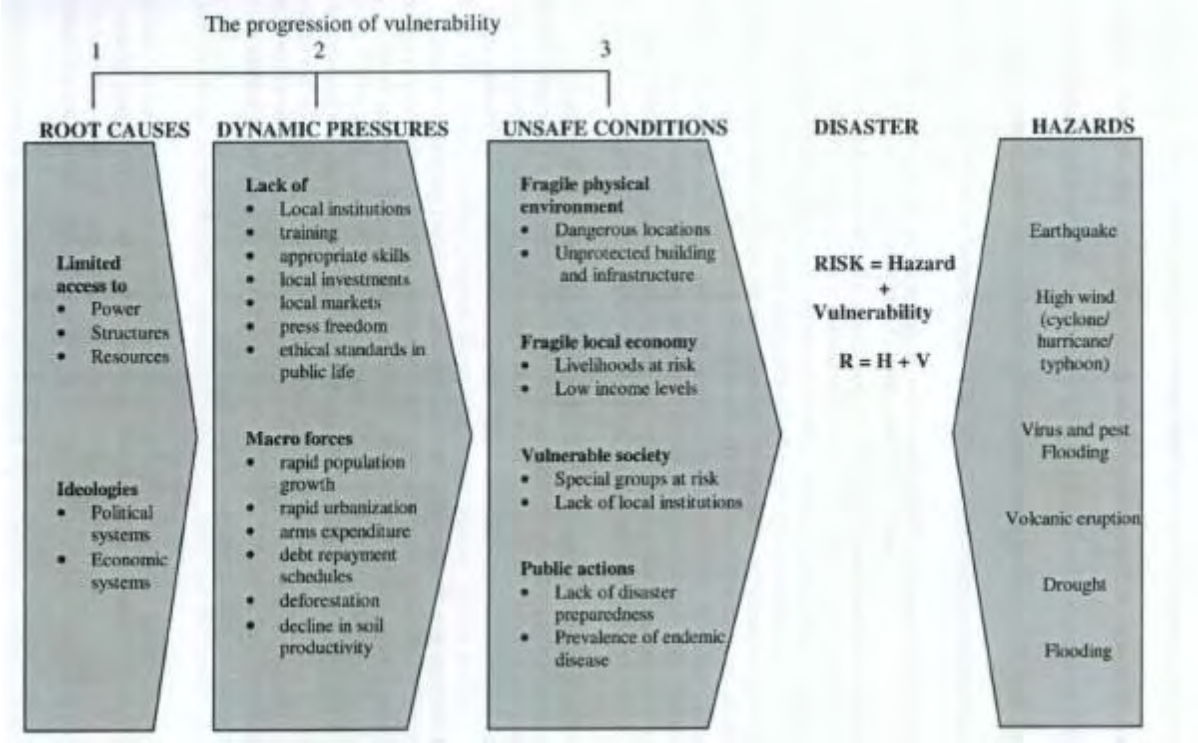


Figure 2: The Pressure and Release Model (Source: Blaikie et al., 2004)

The purpose of the PAR model is to demonstrate vulnerability *to* something, usually natural hazards. Through a combination of vulnerability, and limited livelihoods management capacities, these natural disasters then have the potential to become disasters[6]. In the Borana context this is drought – a natural hazard with potential to become a disaster for individuals, households or communities. Yet, while incorporating the natural hazards aspect, Blaikie's model focuses not so much, '...on the phenomenon' as, '...on people, and their ability to deal with the onset of a natural phenomenon...' (Sanderson, 2009, p. 11). Similarly, the author uses the PAR model to look at the underlying causes of vulnerability for Borana pastoralists, and their ability to deal with potential disasters. She also expands upon the model to enlarge the focus from vulnerability to natural hazards alone, to incorporate vulnerability to various shocks (such as animal disease outbreaks) and stresses (such as protracted conflict).

[6] Disaster = $\frac{\text{Hazard x Vulnerability}}{\text{Management Capacity}}$ (CENDEP, 2009)

2.2.2.The Resilience and Livelihoods (RAL) Model

To analyse the livelihoods of Borana pastoralists, the author decided to use the RAL model developed by Sanderson (2009). The model breaks an understanding of livelihoods down into the following concepts:

- *People:* At the centre of the model are 'people' represented by a single individual or any grouping of people from a household, to a community and wider society.
- *Assets*: People build their livelihoods assets which can be social, human, political, financial, physical, and natural. Assets help build capacity by helping gain better access to resources, and also act to reduce vulnerability by serving as a 'buffer' between outside shocks and stresses and people (Sanderson, 2009, pp. 55-6).
- *Basic needs*: these are the basic, 'physiological requirements to sustain life' (*ibid.*, p.51) and can include food, water, shelter and health.
- *Resources:* Resources need to be accessed by people in order to meet their basic needs and build assets. Resources can include anything needed for people to build their livelihoods on. They can be land, water, health care and education amongst others. Acccessing these resources can be hampered by discimination and controls.
- *Shocks and Stresses*: Shocks are sudden events which occur on an unforeseen basis such as fire, floods, earthquakes. Stresses meanwhile are either ongoing conditions or events which happen with relatively regular predictability. They can include natural events such as droughts, diseases or attitudes which undermine people's dignity or ability to operate effectively, such as prejudice.
- *Capacity and Resilience:* The model also emphasises how capacity can be built to overcome obstacles to the access of resources and how resilience is built as people secure assets and basic needs.

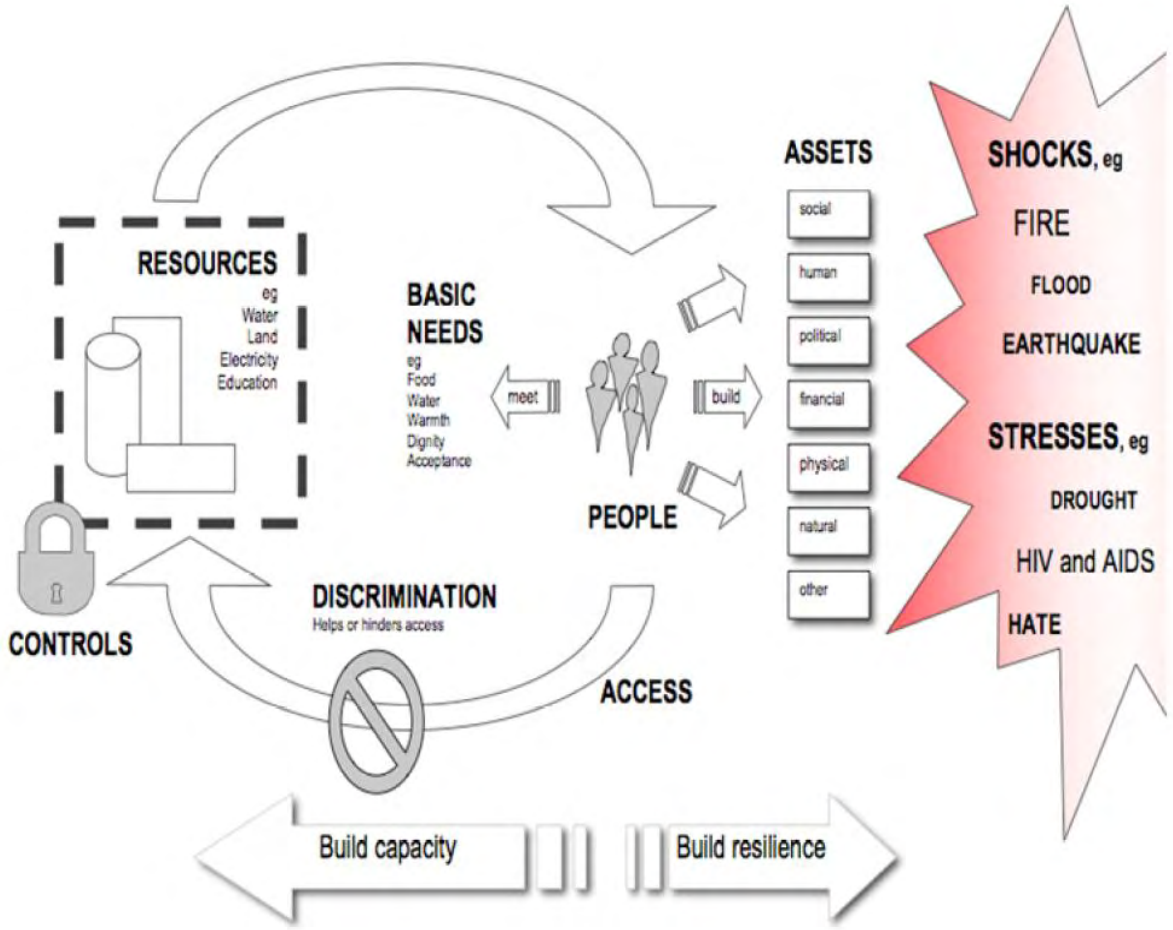


Figure 3: The Resilience and Livelihoods Model (Source: Sanderson, 2009)

There are significant strengths to this model which are appropriate for application to the analysis of Borana livelihoods. Two in particular are noted below:

- Sanderson stresses the resilience aspect of livelihoods by connecting increasing assets with 'building resilience'(*ibid.*, p. 74). Pastoralist livelihoods depend on secure assets, and in particular natural assets. Their livelihoods therefore become far more resilient as natural resources are made more available and access improves and thus natural assets grow. This process would also contribute to reducing vulnerability. As Pavanello suggests, resilience can be seen as 'the other face' of vulnerability (Pavanello, 2009). Resilience is also an important concept to consider when thinking about how livelihoods can become more sustainable. The PAR model will demonstrate the converse where resilience gives way to vulnerability in the face of a multitude of 'pressures'. The Resilience and Livelihoods Model will therefore

demonstrate which assets need to be built up to re-instate the resiliency of this way of life.

- In his updated model, Sanderson replaces the term 'household', with the term 'people'. This avoids the confusion of associating 'household' with a nuclear family and opens up the analysis to any combination of people – individuals, communities and wider society (2009, p.73-74). Although the term 'household' is significant in the Borana context, it is also limiting as the starting point for a livelihoods analysis. More appropriate to the Borana context is consideration of other social structures.

The author uses the model to present an overview of the livelihoods of Borana pastoralists and to address in part one of the aims of this dissertation: to assess the nature of rangelands for pastoralist livelihoods in the Borana region. In keeping with this aim, there will be less emphasis placed on some aspects of the model, such as a comprehensive overview of shocks and stresses and more on others, such as natural over other types of resources.

Chapter 3 – Pastoralism under Pressure

3.1 Pastoralists' environment

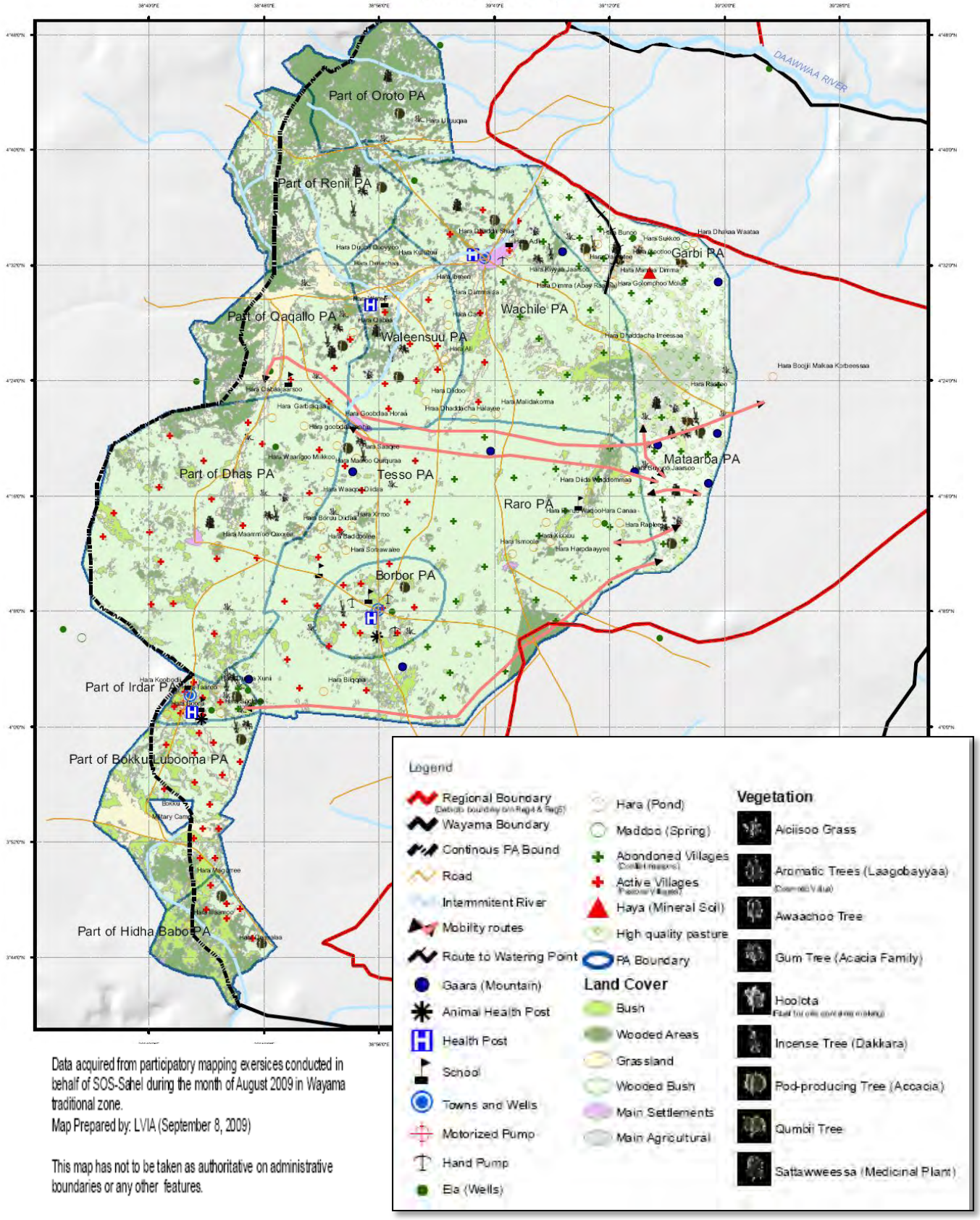
The pastoral environment in East Africa is typified by semi-arid lands. Unlike more temperate regions, these areas are subject to an, 'interplay of strongly fluctuating and randomly interacting biophysical features of rainfall, drought, fire, and epidemic disease' (Homewood, 2008, p.4). Within this uncertain and variable environment, pastoralists take a flexible and mobile approach in order to best maintain an 'optimal balance between pastures, livestock and people' (Nori, Taylor and Sensi, 2008, p.3). In order to ensure access to the key resources of water and pasture, to avoid seasonally disease-prone environments, to avoid raiding and conflict over natural resource use, and to access markets, pastoralist groups have perenially sought access to and control of extensive rangelands, encompassing all the natural resources they need (Homewood, 2008, p.5).

Figure 4: Borana rangelands

The map below is the outcome of a participatory mapping excercise in the *Wayama* area of the Borana region and therefore depicts the pastoralist environment according to pastoralist perceptions and usage. It thus provides a useful insight into how that environment works for them. As can be seen from the legend, key resources include water sources in the form of rivers, wells, ponds and springs, while grasslands are categorised according to where there is high quality pasture. Mineral soils are also indicated as they are vital for the health and condition of livestock. Specific plant species are portrayed since they provide either a source of particularly nutritious grazing for livestock or because they yield substances which can be used in the household or sold in markets, such as incense and gum. Since resources are scattered, and rainfall is seasonal and erratic, to access grazing, water,

minerals, and avoid seasonal disease vectors, pastoralists use mobility as a key strategy for utilizing their environment – here indicated by pink arrows.

Figure 5: Community Map – Wayama Traditional Zone



3.2 Traditional pastoralism - a natural adaptation to harsh environments

Pastoralism is increasingly recognized as an appropriate adaptation to harsh and unpredictable environments and in an unadulterated form would be a sustainable livelihoods option. It evolved, according to Nick Brooks, precisely as an adaptation to climate change over 5000 years ago and as such has inbuilt social and physical resilience to withstand unpredictability (Brooks, 2006). Loosely dispersed, highly mobile populations generally fare better than sedentary populations in highly variable environments. Pastoralism was the most viable option for the unpredictable northern African environment, where reliable supplies of large quantities of water did not exist and where the quality of rangelands varied throughout the year (*ibid.*). Founded on mobility, flexibility and strategies of herd mobility, pastoralist systems are based on the need to respond rapidly to changing climatic and vegetative conditions. Pastoral resource management systems are usually based on customary rules governing access to resources and control of resource use. As a brief by the World Initiative on Sustainable Pastoralism (WISP) (2007) points out these adaptive responses have evolved over time and are critical for long-term management of risk in dry environments. Pastoralist risk strategies include:

1) livestock mobility,
2) livestock diversity,
3) ecological threshold – a negotiated cap on the number of people and cattle that can be allowed to use grazing or a well to preserve natural resources,
4) stratified rangeland – home-based pastures reserved for weak cattle, calves and lactating cows, while stronger animals are moved to more remote pasture,
5) diversification or switching of species composition within the family herd,
6) herd and family splitting during drought,
7) maximizing stocking densities,
8) redistributing assets (mutually supportive relationships and support networks),
9) livestock feed supplementation, such as lopping off tree, bush branches for fodder,
10) use of wild foods,
11) opportunistic cultivation,
12) social support systems,

13) many of these pastoralist strategies also enhance the resilience of the ecosystem[7], thus contributing to the resilience and sustainability of their own livelihoods. (WISP, 2007; Waddington *et al.*, 2009; Scoones, 1996; Obgaharya, 2007).

3.3 Value of pastoralism

As well as being a good adaptation to harsh environments, pastoralism provides considerable services which, if properly recognized, would be a motivator for policy makers to effect policy change in its favour (Hesse and MacGregor, 2006). A study by the African Union/Inter-African Bureau for Animal Resources (AU-IBAR) found that in Ethiopia, livestock contribute about 40% of agricultural GDP and more than 20% of the total GDP and perhaps even more if other intermediate values of livestock are properly assessed. Despite this, however, between 1993/4 and 1998/9, the Government of Ethiopia only allocated 5% of its expenditures to agriculture and less than 0.3% to livestock (Aklilu, 2002 cited in Behnke *et al.*, 2006). Pastoralism, however, has unique adaptive potential and given the right support, functions best in the context of wide rainfall variability and unpredictability, unlike many other forms of livelihood. In East Africa the millions-strong herds of dryland livestock managed by pastoralists are a huge hidden asset. According to Hesse and Macgregor's (2009) economic assessement of the value of dryland pastoralism, new findings show that pastoralism has immense potental for reducing poverty, managing the environment, promoting sustainable development and building climate resilience. The values of pastoralism can be divided into two broad categories which together help provide a more 'visible' indication of the value of pastoralism and services it provides - direct and indirect values.

Direct values consist of measurable products and outputs such as livestock sales (meat, milk and hides), insurance and inheritance (Hatfield and Davies, 2006). One of the most obvious direct values is in terms of subsistence and livelihoods. Pastoralism is very cost effective with 95% of inputs for traditionally reared livestock coming from the sun and soil (Hesse and MacGregor, 2006). The herd provides a 'flow of returns' through animal births,

[7] Resilience refers to the ability of a system to recover after a shock, such as a drought, and many pastoralist risk management strategies also enhance ecosystem resilience (WISP, 2007, p.2), e.g. giving grazed land a period of rest and recover by moving herds to alternative areas.

milk, blood and meat as well as the opportunity to earn cash by selling manure and renting out draught animals. The herd also serves as a household's asset store or investment (Hesse and MacGregor, 2009). For pastoralists livestock are a form of insurance policy too whereby the greater the number of animals a family owns, the greater their chances of managing risks, such as drought where a larger and more age and species diverse herd will recover faster.

As mentioned above, the economic values of a herd also greatly benefit the state in terms of contribution to GDP through the sale of livestock, meat and hides. In Ethiopia for example, the leather industry is the second largest source of foreign exchange after coffee (Hatfield and Davies, 2006). A further consideration in weighing up pastoralism's value is the relative contribution of pastoralism versus more intensive animal production units such as ranches. According to a study reviewing the economics of pastoralism, under the same conditions pastoralism has been found to out-produce ranching, being 2 to 10 times more productive (*ibid.*, 2006). The pastoral Borana system specifically has been shown to have higher returns of both energy and protein per hectare compared to industrialised ranching in Australia (Cossins and Upton 1988, cited in *ibid.,* p.9). Pastoralism should therefore be seen as more than just a mode of livestock production. They are 'consumption systems' (*ibid.*, p.1) which support lives in difficult environments, while at the same time benefiting the state economy.

Indirect values are often of more benefit to beneficiaries than to pastoralists directly. Rangeland products passively managed by pastoralism, for example, are increasingly sought after. These include gum arabic, medicinal plants, tourist services and honey which is a largely untapped potential. A major contribution also comes from ecosystem services. Here animal-maintained grasslands appear to support greater species numbers and contributes to well-functioning water cycles, mineral cycles, and energy flows. Of particular interest and importance for the climate change concerns of today, grasslands have a greater potential ability for carbon sequestration than forests, by virtue of the vast areas they cover (*ibid.*, 2006). Thus pastoral systems should also be valued as, 'natural resource management systems that provide a wide range of services and products that are nationally and globally valued, such as biodiversity, tourism and raw materials' (*ibid.*, 2006, p.1).

3.4 Underlying and ongoing challenges to pastoralism in Borana

The Pressure and Release Model, as described above, can be used to disaggregate the different factors causing vulnerability for Borana pastoralists. Traditionally pastoralists have demonstrated a good degree of resilience to harsh environments. In fact pastoralism is a life style and livelihood which has specifically evolved to meet the challenges of semi-arid environments. Yet today this lifestyle is under severe pressure as maintaining productive livestock, the mainstay of pastoralism, has become an increasing challenge. While drought is a regular occurrence in semi-arid environments, the ability of pastoralists to cope with this natural hazard is being undermined as various factors are preventing pastoralists from pursuing their traditional coping strategies, key amongst which is mobility. Drought is exacerbating the challenges which pastoralists face, yet it is a combination of this with other dynamic pressures and root causes which have instigated the unsafe conditions with which pastoralists currently live, as will be demonstrated in the PAR model below.

3.4.1 Root Causes

As explained in section 2.2.1 the root causes of vulnerability in this model are the underlying causes and the most remote influences – these are deep-rooted and often historically instigated . They can be economic, demographic and political processes within society and may include attitudes which have led to inappropriate policies. The analysis below does not attempt to provide a complete overview of these root causes but does attempt to capture some of the main factors which have affected pastoralists and which have reprucussions for today.

Pastoralists around the world have suffered a negative press from governments, being seen as unruly, hard to control populations which need to be settled. Some of the most common damaging preconceptions of pastoralism are that:

- Nomadic pastoralism is an archaic form of production, whose time has passed.
- Mobility is inherently backward, unecessary, chaotic and disruptive. That it is a predatory and extractive way of using resources.
- Pastoralists contribute little to national economic activity.
- Pastoralism has very low productivity.
- Most rangelands are degraded because of pastoral over-grazing.

- Pastoralists need to settle to benefit from services.
- African pastoralists do not sell their animals, prefering to hoard them, admire them and compose poems to them.
- Men because they own and control livestock are the real pastoralists and women therefore depend on them for their livelihoods (UNDP, 2003; Hodgson, 2000, 1999, cited in Hesse and McGregor, 2006, p.4)

Such perceptions have influenced policy, which itself is often directed by a political elite representing an agricultural majority, as in Ethiopia (Nori *et al.*, 2008). Policy which is informed by such thinking is usually to the detriment of sustainable pastoral systems.

In Ethiopia various policies have contributed to undermining the natural resilience of the Borana pastoralist system. The most aggressive occurred under the Marxist-Leninist dictatorship of Mengistu Hailemariam (1987-1991). During this period the socialist regime nationalized land including the communal land of the Borana. Various agricultural settlement schemes and modernization programs were implemented based on the preconception that the Borana pastoralists practiced backward and inefficient pastoral management, did not produce enough food and would be extremely vulnerable to drought. The rangelands were, moreover, misperceived as 'open access' resource systems with ill-defined user rights and few restrictions. Development projects consequently focused on granting land for agriculture, the construction of permanent water holes and veterinary services. Combined with a lack of consultation with traditional governing councils these measures caused the disintegration of customs, traditions and safety nets. Having displaced traditional institutions, the socialist government failed to put in place parallel administrative institutions. In 1975 Pastoral Associations (PAs) were introduced to enforce usufruct land reform, but usufruct rights tended to be granted to individuals (Ogbaharya, 2007). There are many consequences to these policies, amongst which are that more land was taken out of communal grazing, and that traditional land enforcement regulations became undermined – repercussions which continue to today. The state ownership of land and a crop-agricultural bias in development policy continues in the post-socialist regime era of today which boasts democracy and participatory development under the Ethiopian People's Revolutionary Democratic Front (EPRDG) (*ibid.)*.

Following on from Mengistu-era policies in 1988 the Southern Rangelands Development Unit (SORDU) instigated water point development on a large scale. SORDU

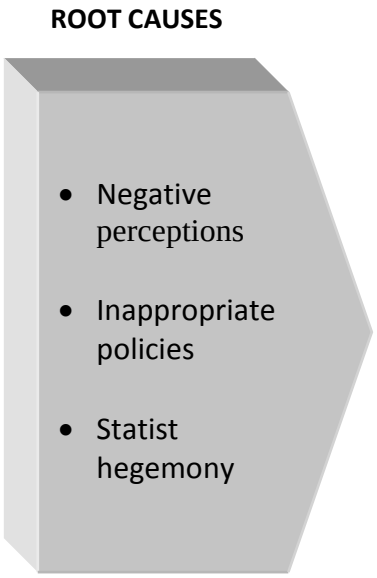
eventually constructed 126 ponds[8] and rehabilitated some traditional wells (Oba, 1998). The aim of this initiative was to reduce pressure on the dry season grazing lands where traditional wells were located by creating water points in the wet season grazing rangelands. This overlooked the fact that the wells had been constructed here for a reason, encouraging rotational wet and dry season grazing. It was this movement which according to Oba, 'preserved the rangelands' (Oba, 1998, p. 49). The consequence of developing unregulated water access, free and easy to exploit was that, unlike with traditional water sources, permanent settlements soon grew up leading to the abandonment of the wet and dry season grazing patterns: 'The rangelands, served by perennial ponds were overstocked, leading to severe environmental degradation' (Messele, 1997 cited in Oba, 1998, p.49).

Land alienation furthermore came in the form of ethnic conflict and the government formalisation of ethnic boundaries. There had been ongoing territorial conflicts between the neighbouring Somali ethnic groups and Borana for decades. This was partly due to different land use strategies. Whereas the Somali groups moved into new areas as a family, the Borana used more remote pastures intermittently. Continuous pressure from the Somalis led them to eventually occupy the wet season rangelands whilst the Borana were stationed in their dry season grazing areas. In the process they succeeded in displacing the Borana from two thirds of their traditional grazing lands (Bassi, 1997). The Borana have an age-old tradition of hosting, assimilating and living peacefully with minor ethnic and other groups with whom they forge alliances e.g. In the *Liiban* territory often subject to rivalry over natural resource, the Boran established the *Liiban Alliance*, which agreed to shared resource use (Elemo, 2005). Such conflict resolutions systems have, however, been undermined by the crystallization of ethnic boundaries by the state. In the above case, for example, a 2003 referendum subsequently gave these wet season rangelands to the Somalis. The loss of this land was therefore state-condoned. Not only have the Borana subsequently lost the whole of the eastern rangeland, with it they have also lost access to some of their deepest wells (the *Goof* and *Lael* wells) and were denied access to the Dawa River. This has particularly affected households near the area. The shrinking area of pasture has put the remaining grazing under immense pressure and caused land degradation, along with water shortages.

[8] Pond capacity ranged from 6000m^3 to 10000m^3 (Oba, 1998)

Livestock morbidity has increased resulting in the reduction of herd size by about 80% (Elias, 2008).

Negative or uninformed perceptions of pastoralism in Ethiopia have led to inappropriate policies which have paid little regard to the internal workings and cohesion of the pastoral system. Moreover, development projects focused on *components* of the pastoral system, ignoring 'the whole' (Oba, 1998), as seen with the SORDU water development projects which contributed to upsetting wet and dry season migration patterns. Overarching these developments is the role of state administration. Statist hegemony, for example, by necessity creates administrative zones. In so doing static boundaries are effectively established where boundaries were formerly fluid, thus restricting pastoral mobility and politicizing ethnic boundaries. The sum effect was the alienation of pastoral land which itself is the 'root cause for much of the problems detected in the pastoral areas today such as environmental degradation, food insecurity, drought vulnerability and ultimate destitution' (Elias, 2008, p.26). These factors contribute to the root causes of vulnerability in Ethiopia in the PAR model as shown in figure 12.



3.4.2 Dynamic Pressures

As noted in chapter 2.2.1 dynamic pressures grow out of the root causes. They are more, 'contemporary and immediate, conjunctural manifestations of general underlying social, economic and political patterns' (Wisner *et al.*, 2004, p. 53). This section will explore how the Borana pastoralists continue to experience marginalisation as the result of socio-economic pressures, environmental pressures and political marginalization alongside the cross-cutting issue of land alienation.

1) Socio-economic pressures

Socio-economic pressures are treated here on two levels – macro and micro. At the macro-level large-scale forces are affecting the livelihood security of Borana pastoralists, namely a)

population pressure, and b) food insecurity. At the micro-level, c) the role of customary institutions in regulating land use is increasingly undermined as statist hegemony continues to create a confused area of jurisdiction at the local level, where customary authority over land and national legislation overlap. As traditional systems for managing life in the ASALs are becoming less effective, pastoralists may diversify their livelihoods portfolio through such activities as crop agriculture, however, d) crop productivity is often poor. Furthermore, crop agriculture, alongside e) ranching remove valuable land from grazing, contributing to the interplay of mutually reinforcing trends which are causing increasing vulnerability.

a) Population pressure

During interviews with the author, Borana pastoralists cited population pressure as one of the reasons for constricting rangelands. Human population pressure has increased substantially contributing to a proliferation of unplanned settlements which block migration routes and encroach onto pastures. Annual population growth in the pastoral lands of Ethiopia is estimated to be 2.8%, which will double the pastoral population every 25 years (Nori, 2007). Pure pastoralism, which relies solely on the milk and meat produced by livestock, can support 2-3 people/km^2. In 2003, however, the Borana population was found to be closer to 6-7 people/km^2 (Coppock and Desta, 2004). Pastoral areas are particularly sensitive to such growth, as each pastoral household requires a minimum herd of 40 sheep/goats, and a few milking cows and/or camels to be food secure (SCUS, n.d.). Such increases in human and animal populations are difficult for the rangelands to sustain and create a variety of challenges. For example, according to the testimony of Dalo Gababa, a 36 year old Borana pastoralist, 'Because of population pressure, pasture land has become limited and it is no longer easy to just settle in a piece of land and graze your animals. If you do this you are likely to be attacked by land owners' (Ogwell, 2009). As seen above, border conflict may be one of the causes of population increases. When land comes under the control of an outside group, such as the Somali pastoralists, the existing population is forced to migrate deeper into Borana lands thereby creating further demands on natural resources (Gemtessa, 2005). Livelihood changes therefore need to occur for people to continue to survive in these numbers on this landscape (Coppock and Desta, 2004).

b) Food insecurity

Food security depends on the availability of animal production, but this has severely decreased as a result of land alienation. In one community over the last 10 years, for example, the daily milk yield declined from about 4 litres to 0.75 litres per cow (Gemtessa, 2008). In a recent survey[9], 85% of Borana households were found to face food insecurity irrespective of their socio-economic group[10] and are in need of food for about 5 months of the year (Elias, 2008). Coping strategies during this period include selling livestock and reliance on food aid programmes[11] (*ibid*). Erratic or negligible rains have worsened the situation in recent years and combined with a variety of other factors this has contributed to continuing food insecurity for the Borana, cementing the ranking of Borana zone as 'highly food insecure', as per the below map.

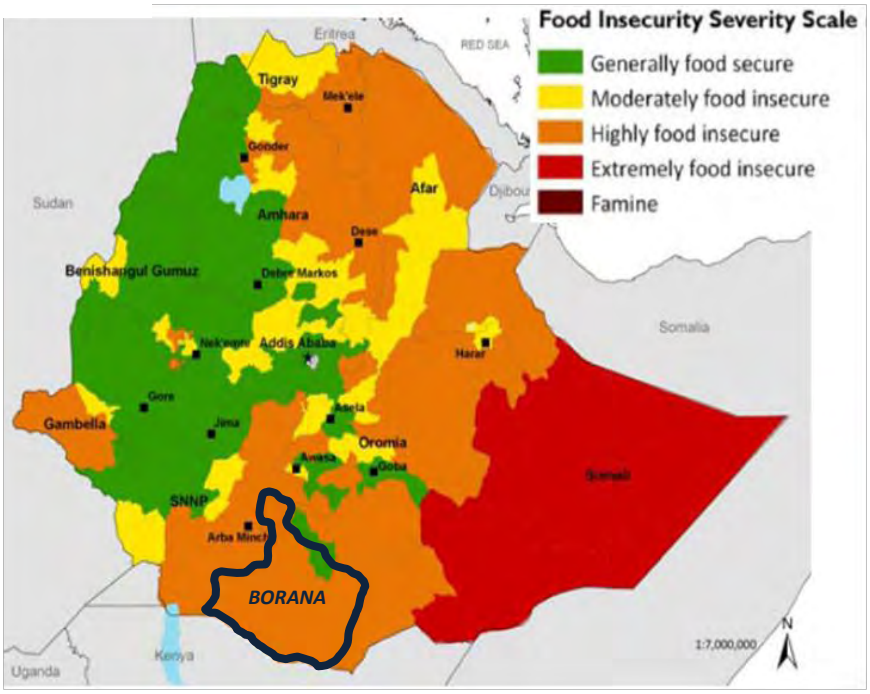


Figure 6: Food security estimate for October, 2009 (Source: FEWS NET and WFP, with modification by the author)

[9] Conducted in 2007 and commissioned by the Drylands Coordination Group of Norway and its local partner, SOS-Sahel. It involved 300 Borana households (see Elias, 2008).

[10] The Borana classify themselves into the three wealth groups of rich, medium and poor (see Gemtessa, 2005)

[11] A Cordaid and FSS study found that between June and November of 2008, for example, almost 47% of the pastoralist and agro-pastoralist populations in Borana Zone were in need of emergency food aid (Amsalu and Adem, 2009, p. 57)

c) Undermined customary institutions

Internal changes to Borana social institutions are affecting the regulated use of natural resources. For centuries, indigenous knowledge inherent in complex customary arrangements for resource management ensured that land was grazed appropriately, that a strict code of conduct existed around water point usage and that disputes over land were resolved for the communal good. These traditional natural resource management systems, effective when there was less pressure on resources, are breaking down. The regional government has increasingly subsumed authority and will override decisions made by customary institutions. An example given by a pastoralist elder is that occasionally an individual will make a claim on land for his own private use – as private fodder reserves or for crop cultivation. When admonished by the local pastoralist authorities, he will resort to the authority of the government regional offices who may overrule the objections of the customary institutions authority (Borana elders, personal communication). There is a trend in the individualisation of economic activities where community members can reinforce their private ownership claims by payment of a land tax to the *kebele* administration. Private benefits are thus legitimized at collective cost.

d) Unreliable crop productivity

Crop agriculture is often instigated by pastoralist families who can no longer make a living from animal production alone and as a means of supplementing household food needs and diversifying their means of subsistence (Elias, 2008; Gemtessa, 2005). This subsistence strategy, however, often involves land grabbing and the land which is good for crops is also often prime grazing land located in the humid and wetter areas along valley bottoms and foot hills. A physical challenge, however, comes from the very reason for which pastoralism, rather than crop agriculture was established in these ASALs in the first place – the unpredictability of the environment. Maize, alongside wheat and bean crops, may have a high energy content, but there is an 80% chance that maize crops, for example, will fail in southern Ethiopia in a given year (Desta, 1999 cited in Coppock and Desta, 2004, p.3). Coping strategies such as crop agriculture arise from land alienation and loss of animal productivity, yet they do not provide secure or sustainable solutions to food insecurity. Crops are unpredictable and land becomes unusable in the process. According to land

management consultant Richard Hatfield, crop agriculture causes irreversible damage to the rangelands (personal communication). Because of the land used, crop agriculture also interrupts seasonal livestock mobility and grazing availability, thus having a pronounced negative knock on effect to livestock feed security (Gizachew, 2008, p.18). Alongside ranches, the expansion of crop agriculture into the rangelands has intensified the pressure on the remaining grasslands, and it itself is an unreliable food source.

e) The problem of ranching

The establishment of ranches is a major contributor to the loss of pastoral land area - the basis of the Borana economy. In a survey of 300 Borana households, 60% reported that they lost their prime rangeland due to the establishment of state and private ranches. Today 5 big ranches in their rangelands are occupying about 33,000ha of rangeland and this area represents some of the best grazing and watering resources of the pastoral communities (Elias, 2008).

Name of the ranch	***Woreda***	**Area (ha)**	**Ownership, Purpose and management**
Diid Tuura state ranch	*Yabello*	5,550	State owned and established for conservation of *Borena* breeds and production of heifers for the national breeding programmes
Surupa private ranch	*Yabello*	4,467	*ELFORA* ranch used for animal fattening for live export and domestic markets and Abattoir
Diid Liben private ranch	*Liben*	1,058	*ELFORA* owned for animal fattening for live export and domestic market
Damballa Wachu cooperative ranch	*Dirre*	15,000	Group ranch used for animal fattening by members only; the community is excluded
Sarite community ranch	*Teltele*	7,750	Community managed and used as fodder reserve for the dry season
Total		33,805	

Table 1: Major ranches operational in the Borana rangelands (Source: Elias, 2008)

Aliyu Mustefa, project manager for the ELSE project at CARE, Ethiopia, noted that the Damballa Wachu ranch, listed above, could only be used by rich pastoralists who gained access rights by paying a fee (personal communication). Any pastoralists found grazing their animals on the land without payment of the fee are moreover subject to a hefty fine. The ranch provides rich grazing in comparison to the neighbouring communal lands as can be seen in the below pictures. Thus ranches are yet another factor contributing to the alienation of grazing land.

Figures 7 and 8 (above): High grasses in Damballa Wachu Ranch provide choice browsing for zebra which, unlike most pastoral cattle, can graze here freely

Figure 9 (left): Neighbouring land outside the ranch is more barren and is often grazed to the ground

2) Environmental pressures

The condition of the land is very important for Borana pastoralist livelihood strategies. The state of the soil and vegetation has been maintained in part by centuries of interaction between the herds of pastoralist cattle, sheep and goats and other ecological processes. As mentioned above, customary systems regulated land usage thus avoiding land degradation and other ecological changes. Land degradation has, however, now become a common feature of the Borana rangelands, due to socio-economic and political pressures, the reduced availability of pastures, but also as a result of increasing drought. Land degradation and drought are major environmental factors causing vulnerability for Borana pastoralists.

a) Land degradation

Rangeland degradation is understood as a significant change in plant species composition from the desirable perennial-dominated to annual-dominated species as well as an increase in woody plants on range previously dominated by perennial grasslands (Oba, 1996, cited in Kontoma, 2000). As a consequence of various factors, the land available for pasture in Borana is increasingly reduced and livestock have a smaller shared area to graze on. The ecological balance is upset as the *space* available for grazing is gradually reduced while the *time period* over which each area is grazed is increased. The result is that the rangelands are overgrazed and vegetative cover is lost leading to bush encroachment and soil erosion and the expansion of invasive plant species. The heavy infestation of invasive species has reduced the availability of herbaceous species which has contributed to increased surface water run-off and created extensive gullies (Gizachew, 2008, p.19). As the example of the below table shows, where 30 years ago pure grassland (optimal for grazing cattle and shoats) constituted 43% of the rangeland, today it is just 6% of the land area of the Yabello district in Borana.

Land Use/Land Cover Class	1973		1986		2003	
	Area (km^2)	%	Area (km^2)	%	Area (km^2)	%
Bushlands	80.0	20.0	100.0	25.0	115.0	28.8
Bushed-grasslands	134.0	33.5	161.0	40.3	198.0	49.5
Grasslands	173.0	43.3	106.0	26.5	24.0	6.0
Croplands	13.0	3.3	33.0	8.3	63.0	15.8
Total	**400.0**	**100.0**	**400.0**	**100.0**	**400.0**	**100.0**

Table 2: Changes in land use cover for Yabello District, Borana Zone (Source: Sintayehu, 2006)

As this loss of rangelands continues the Borana will become increasingly less able to support themselves through livestock production.

b) Drought

Drought is defined by Coppock (1994) as a period when two or more consecutive dry years occur in which the length of the growing period is less than 75% of the mean, and the deficient rainfall has detrimental effects on the production system.

In Borana, the average annual rainfall ranges between 350mm and 900mm, with considerable spatial and temporal variability in quantities and distribution. Rainfall is

bimodal, with 60% occurring in the long rainy season (*gaana*), which occurs from March to May, and the short rainy season (*hagaya*) from September to November, as shown in the table below.

Months	J	F	M	A	M	J	J	A	S	O	N	D
Borana	Boona hagaya (long dry season)		Gaana (long rainy season)			Adolessa (short dry season)			Hagaya (short rainy season)			

Figure 10: Seasons in Borana Zone (Source Riché et al., 2009)

Recent local and scientific[12] observations, however, show that the climate is changing. Recent trends include increasing temperatures, drought frequency, as well as unpredictable rains which fall in shorter and more intense periods, however the main climate-related hazard affecting pastoral communities in Borana is drought (Riché *et al.*, 2009). In the past, droughts lasting several years occurred approximately once in 20 years and isolated 'dry years' (where rainfall is below 400mm) once in five years. Recently, the period between droughts has decreased to between 7 and 3 years and in pocket areas to every other year (Homann, 2004, Gizachew, 2008).

Karu Ardi, a 45 year old pastoralist woman describes how drought is affecting her and her family, 'Previously, drought came every 8 years and it was something we knew and prepared for, but now the drought season is long and is here almost every year' (cited in Ogwell, 2009, p. 3). In 2008 when drought hit Ardi's Jaso Dima village, she and her family lost 2 camels and 5 cows, which is a considerable loss for any pastoralist (*ibid.*). Families like Ardi Jaso's are forced into temporary alternative livelihoods strategies in order to earn a bit of money with which to buy cereals to feed themselves and weaker and young animals. They will feed their animals on tree leaves to supplement the little pasture or sell salt or firewood to survive, although the government has imposed some restrictions on the selling of firewood.

Recurrent drought has been a major feature of the climate of the Ethiopian lowlands which includes Borana. Strategies to cope with and adapt to these droughts is

[12] Riché (2009, p.15) notes that there is a lack of meteorological records at the localized level for Borana. Therefore, such scientific information must build upon and be complemented by an analysis of local-level climate observations through consultation with communities and other local actors who experience climate change at first-hand.

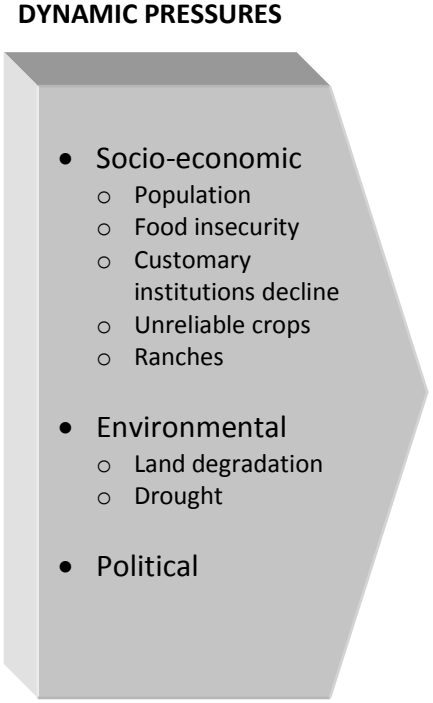
embedded in communities' traditional social structures and resource management systems. Changes in the frequency and intensity of droughts, however, combined with other environmental, socio-economic and political issues, are making many of these traditional strategies unsustainable and in turn amplify environmental degradation and food insecurity (Riché *et al.*, 2009).

3) Political marginalization

The political marginalization of pastoral communities in the Horn of Africa is widely understood as a primary factor in their ongoing vulnerability (see Morton, 2008; Makakis, 2004; HPG, 2006 in Pavanello, 2009): 'Adverse policies and practices, unresponsive formal institutions and persistent negative perceptions of pastoralism have progressively weakened pastoralists' livelihoods strategies' (Pavanello, 2009, p. 6). NGOs, such as SCUS have noted that an increasing number of policy makers in Ethiopia are beginning to recognize the relevance and appropriateness of mobile livestock production systems', but that there are still more conservative policy makers who, 'will continue to regard pastoralism, and livestock mobility. . . as economically unfeasible and tolerable only until a 'modern' alternative can replace it[13] (SCUS, n.d., p. 9). An example of this in Borana was in evidence while I was visiting the area, where work has begun on a large scale irritation scheme using ground water. Yet this began without a detailed economic assessment of the economic returns of irrigation and livestock production systems, implying that crop agriculture is still assumed to be more productive than pastoral systems.

Dynamic pressures are ongoing trends which create increased vulnerability amongst Borana pastoralists. While different livelihood challenges are presented by socio-economic, political and environmental pressures, a common thread is land alienation. A feedback loop also exists between these different factors whereby one trend may exacerbate another. Crop agriculture, for example, may be a strategy pastoralists use to spread the risk of food insecurity and avoid having to sell off cattle in times of drought. Yet crops also occupy valuable rangeland and thereby contribute to land alienation, over-grazing and land degradation. The dynamic pressures create the conditions for the at-risk-factors (or 'unsafe

[13] Yet, see the section on Pastoralism and Services for the contributions pastoralism in its current form makes to the national economy.



conditions', according to the PAR model), which make the Borana pastoralists increasingly vulnerable.

3.4.3 Unsafe conditions/At risk factors

The third phase of vulnerability in the PAR model is termed 'unsafe conditions'. This phase constitutes, 'the specific forms in which the vulnerability of a population is expressed in time and space in conjunction with a hazard' (Wisner *et al.*, 2004, p.55). The Borana pastoralists have been shown to be vulnerable as a result of various pressures. The conditions under which people conduct their daily lives are what Wisner *et al.* would term 'unsafe conditions' (*ibid.*, 55). The vulnerability analysis will at this stage therefore attempt to provide a picture of the immediate conditions which would enhance the vulnerability of the Borana pastoralists in the event of the sudden onset of a disaster. As such, there is an overlap with dynamic pressures which are ongoing but which also lead to unsafe conditions. In this section the author prefers to use the term 'at risk factors' to 'unsafe conditions' since 'unsafe conditions' carries an association with buildings and settlements, whereas in the pastoralist context it is natural structures and institutions which create vulnerability.

1) Inadequate drought preparation and response

Drought is a regular occurrence in pastoral areas of Ethiopia and therefore an appropriate response, 'must be premised on the fact that it is a largely predictable event. . .' (Pantuliano and Pavanello, 2009, p.3). Emergency response needs to be closely integrated with strengthening and protecting pastoral livelihood systems, since by equipping communities with the ability to become more resilient to shocks, the effect of the shock itself can be minimised, while the impact of emergency responses can be magnified.

There is, however, a lack of integration between development and emergency response for ASAL regions in Ethiopia, according to an HPG study conducted in 2008 (see Pantuliano and Wekesa, 2008). The institutional framework for drought management in Ethiopia, for example, creates an artificial separation between *ongoing* problems and

emergencies, since two agencies[14] are given separate responsibility for each with little co-ordination between them (*ibid.*, p. 18).

Funding patterns, moreover, show that there is a continued imbalance between food and livelihoods interventions. During the 2006 drought in the Horn of Africa, for example, the percentage of funding for food aid in Ethiopia was higher than for livelihoods interventions:

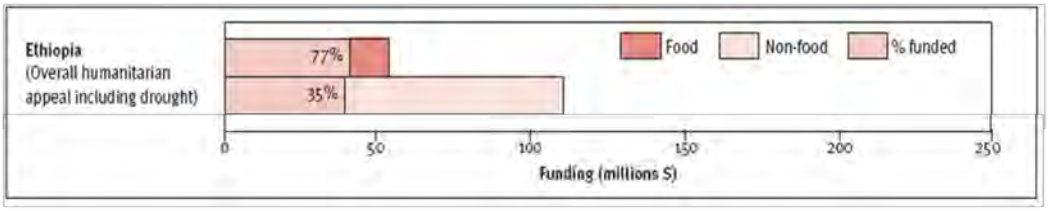


Figure 11: Funding appeals and contributions (Source: HPG, 2006 with modifications by the author)

A greater focus on livelihoods and better co-ordination of drought cycle management would reduce the unnecessary loss of capital from cattle deaths during drought. Studies have shown that droughts between 1983 and 1998 resulted in huge losses of the cattle population through starvation. Interventions aimed at encouraging the pre-emptive sale or slaughter of these animals could have significantly lessened the calculated total $300 million loss to Borana pastoralists over this period (Desta *et al.*, 2001; Pantuliano and Pavanello, 2009).

The imbalance is being redressed through such projects as the Pastoralist Livelihoods Initiative (PLI)[15], Regional Resilience Enhancement against Drought (RREAD), and ELMT/ELSE which aim to strengthen pastoralist livelihoods through a variety of development interventions. Crucial in allowing agencies to switch quickly from development to emergency mode, are flexible funding mechanisms (Pantuliano and Pavanello, 2009) and the USAID-funded PLI project for a start allowed implementing agencies to identify the type of response required and to reallocate up to 10% of total budgets without permission from the donor (*ibid.*, 2009). While these adjustments are certainly making headway, pastoralists still need consistent and better-co-ordinated support for their livelihoods strategies in order to be equipped to face the challenge of drought with more resilience.

[14] The Disaster Prevention and Preparedness Agency (DPPA) oversees emergency response and the Food Security Coordination Bureau looks to long-term food and livelihood security (Pantuliano and Wekesa, 2008)
[15] PLI was implemented by a consortium of NGOs, including SCC/US and CARE in different regions of Ethiopia, including Borana.

2) Reduced mobility options and drought reserves

A foremost coping strategy for pastoralists has been to move herds to new areas in the event of drought. Due to a loss of rangeland and blocked migration routes this option is now increasingly difficult. Another important 'emergency' land use strategy, as part of customary land management techniques, was for communities to set land aside for use in times of drought. Up to the 1980s these drought reserves were still a viable coping strategy, but are now far less available. According to a PARIMA (Pastoral Risk Management Project)[16] study, it took about two years following the initial drop in rainfall during the 1983-5 drought before cattle began to die in large numbers. The delay is attributed to the better availability of drought grazing reserves at the time. Now, however, pastoralists report a loss of these key grazing reserves as a result of encroaching cultivation, the proliferation of bush, insecurity with respect to conflicts with neighbouring ethnic groups, and the occupation of some reserves by surplus Boran households with no other place to live (Desta *et al.*, 2001).

3) Decline of Borana cattle breed

The Borana's indigenous zebu cattle have energy sparing mechanisms that act as an adaptation to under-nutrition and water deprivation. Studies have found that metabolic rates decreased by around 30%, especially in the first 30 days of under nutrition leading to decreased water requirements. Forage rates in times of drought may similarly be reduced by as much as 30% (Scoones, 1996, p.17). This resilient breed, however, has been found to be demonstrating signs of chronic undernourishment as a result of loss of grazing. Communities in Borana related how 10 years ago their cattle had broad rib cages – a sign of well-fed animals. Now, however the ribs grow more straight-downwards, indicating that the animals are poorly fed (Gemtessa, 2005). This could be in part attributed to a change in genetic resources, but the net result is that cattle are not as resilient in times of shortage as in former times with emaciation accounting for 50% of all deaths (Kontomo, 2000, 49).

[16] PARIMA is a project of the Global Livestock Collaborative Research Support Programme, conducted in collaboration with the International Livestock Research Institute (ILRI).

4) Limited livelihoods strategies

Traditionally Borana pastoralists have relied on coping strategies which focus on herd management and mobility as ways of mitigating the impacts and consequences of natural hazards. Pastoralists may be reluctant therefore to engage in economic activities that remove them from this traditional area of risk minimization (*ibid.*, 2000, p. 104). Strategies which grow out of traditional methods are, however, helping to bolster pastoralist resilience in times of drought. These include hay making for fodder reserves, improving access to markets, developing the milk and meat value chains, supporting food and feed purchases, and rangeland rejuvenation. However, many of these initiatives need development and need to reach a wider range of beneficiaries. Meanwhile pastoralists have to rely on short-term strategies to cope with drought such as using water supplied by NGOs and government, food aid, eating chat (to decrease appetite), engagement in casual labour, petty trade, and selling charcoal, firewood, and wood for construction (Riché, 2009, p.33).

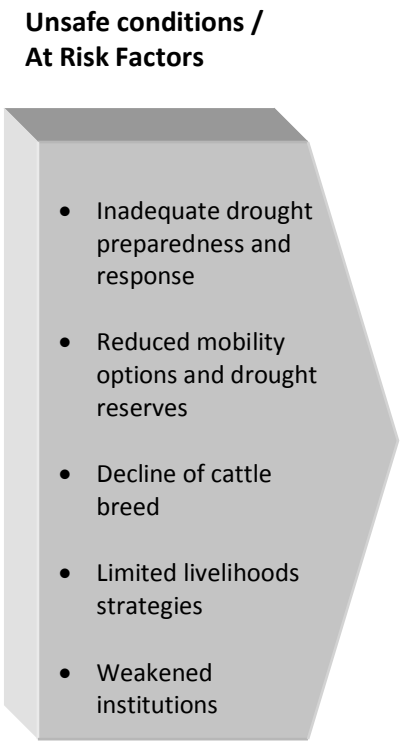
5) Weakened customary institutions

As customary institutions are weakened, systems which help to support pastoralists through times of hardship are gradually eroded. One of the main social support systems for the Borana is the *buusa gonofa* system. The Borana pastoralist system is a redistribution system that ensures that following a disaster, the livestock of victims are replaced. Social responsibilities and customs, known as *buusa gonofa*, ensure that networks of friends, kin and descent groups will share or redistribute milk herds in order to help households recover from destitution (Oba, 1998, pp.76-7). The system depends on the survival of the livestock economy, and on 'wealthy' households, in terms of per capita livestock holdings. The trend in declining herd size[17] and productivity, and increases in the number of poorer people requiring such assistance (Gemtessa, 2005) however, means that pastoralists are no longer so willing/able to share their livestock assets in times of crises. Furthermore, clan members started refusing the directives of clan leaders regarding the implementation of *buusa gonofa* and have appealed to *kebele* social courts which can and often do order the clan leaders to

[17] Studies have shown that there is a general downward trend in livestock wealth per household and populations overall appear to be poorer. In a recent survey, almost 50% of 317 Borana households reported a decline in wealth status while only 7% reported an increase (Coppock and Desta, 2004).

reverse their instructions (*ibid.*). Thus with the declining authority of customary institutions, the vulnerability of households in times of drought increases.

A decline of social assets in the form of traditional institutions, of physical assets in terms of access to and availability of rangelands and resiliency of cattle, and the need for better co-ordinated emergency and development planning for pastoral areas, alongside dynamic pressures such as ongoing food insecurity, means that Borana pastoralists are at a stage where they are vulnerable to natural hazards such as drought.



3.4.4 Hazards and disasters

The PAR model directs its vulnerability analysis to explain vulnerability to natural hazards. There are a number of climatic and non-climatic hazards affecting the livelihoods of Borana communities, including conflict, locust infestation, bush encroachment, livestock diseases and human diseases. However, drought is a major external shock and a primary trigger of livelihoods crises in the Horn of Africa (Pavanello, 2009). In a recent study in Borana, involving community groups in three PAs, 9 out of 11 ranked drought as the main hazard, while, the other three groups ranked it as the second most important hazard (Riché *et al.*, 2009). While drought has been an ongoing phenomenon for the Borana pastoralists, the effects have increased in severity due to a combination of factors from land alienation to pastoralists' marginalisation from the political process and the deterioration of customary institutions. A PARIMA study on livestock dynamics during drought reported that compared to the mid-1980s, the entire system appeared less able to protect the pastoral population from drought by the early 1990s (Desta *et al.*, 2001). While the ability to cope with drought has been reduced, a further issue is that the drought cycle has changed. Droughts have increased in frequency, giving pastoral households less time to recover from the impacts of

the preceding drought. Over the last decade, droughts prevailed in the years 1998/0, 2000/01, 2003/04, 2006/7 and 2007/8 (Cordaid and FSS, 2009, p. 7).

According to Wisner et al. (2004, p.7), 'in disasters, a geophysical or biological event is implicated in some way as a trigger event or link in a chain of causes'. Drought often acts as this trigger in the instance of pastoral (and other) areas of Ethiopia, causing, 'crises' through, 'alarming losses of life, emergency levels of malnutrition and crippling losses of livelihoods assets' (Lautze *et al.*, 2003, p.14). This understanding falls within the broader definition of 'disaster', i.e., 'when a crises overcomes the capacity of a community to cope with it' (Lautze and Hammor, 1997, cited in Lautze *et al.*, 2003, p. 39).

3.5 Conclusion

The above analysis helps to provide an understanding of some of the factors causing vulnerability for pastoralists in the Borana Zone of Ethiopia. Amongst these are historical attitudes and policies towards pastoralism (root causes), a variety of ongoing socio-economic, environmental and political factors (dynamic pressures), and particular conditions which undermine the ability of pastoralists to cope when faced with drought (at risk factors). While these pressures affect pastoral life on a daily basis, they have the potential to cause a disaster in the event of a natural hazard such as drought. The PAR model below depicts the progression of these factors.

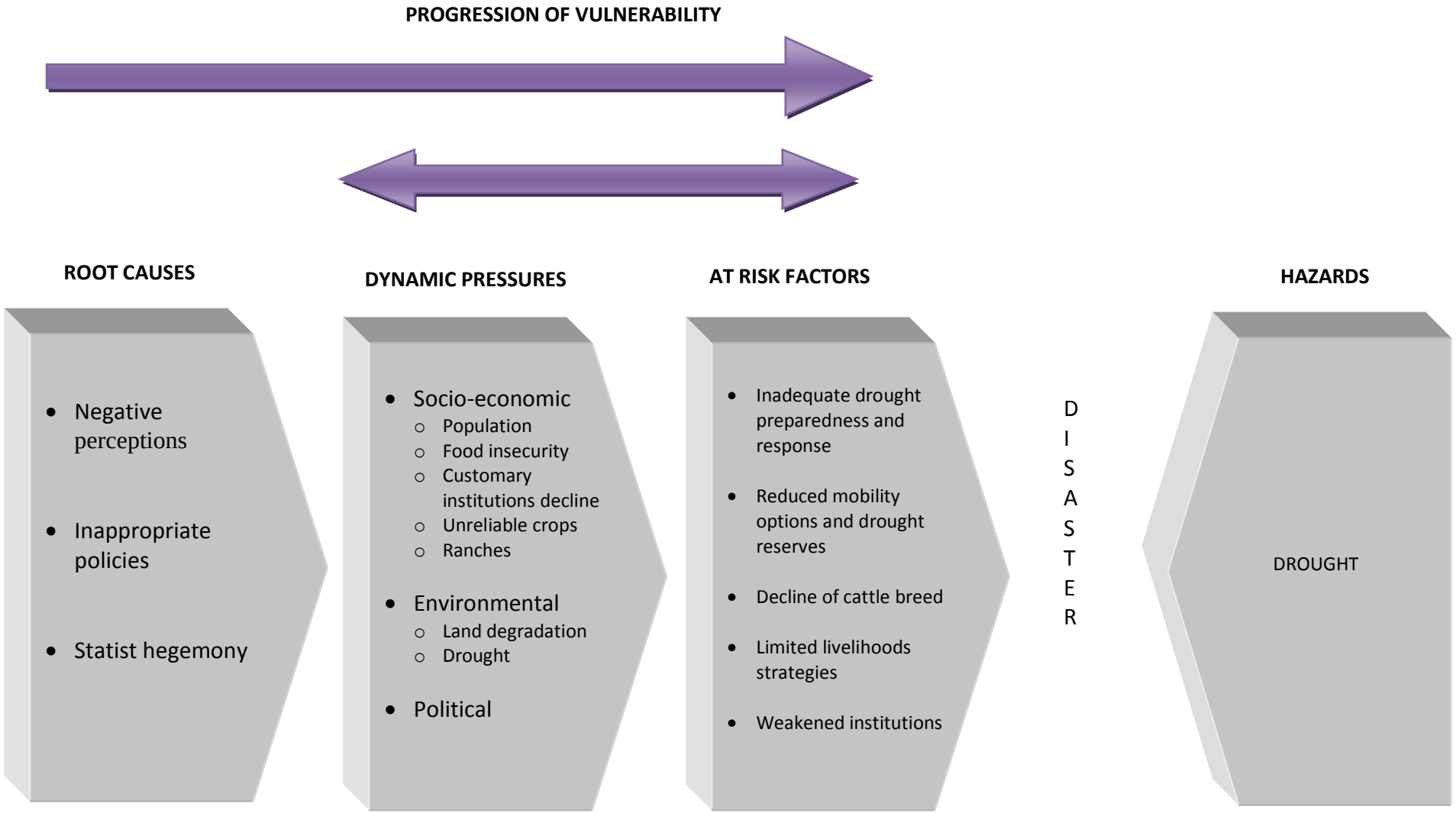


Figure 12: Pressures which create vulnerability amongst the Borana pastoralists of Ethiopia

Drought has been identified as one of the major natural hazards for (and by) Borana pastoralists, however the author would at this point like to draw attention to two points which will help in thinking about the issue of vulnerability in a wider context, and particularly in the context of how better rangeland management can help improve pastoralist livelihoods.

First of all, looking at the model from the hazard side, drought is *one* of a number of risk factors or stresses which pastoralists face on a regular basis. Although drought may be designated as the main hazard, increasing vulnerability also makes pastoralists less able to cope with shocks such as disease and conflict. There has been an explosion in the local tick population, for example, which causes mastitis in cattle. The disease has been blamed for drastically reducing the milk yield (Gemtessa, 2005). Another example is conflict. Outbursts of conflict are on the rise as competition over scarce pasture and resources increases. Fighting usually leads to the loss of life and property. For instance, a conflict in March 2008 between the Borana and neighbouring Konso people, has led to the displacement of 27, 000 people and raiding and looting of 1500 heads of livestock. Recent conflict in the Teltelle, Moyale and Dhas districts of Borana has also caused the displacement of people and huge property losses (Cordaid and FSS, 2009).

Secondly, the first half of the model showing the progression of vulnerability in the form of root causes, dynamic pressures and at risk factors can stand alone as a way of showing pastoralist vulnerability even in the absence of hazards and disasters. The physical nature of ASALs and historical evolution of pastoralism as a livelihood which works in these harsh environments means that any socio-economic and political disruptions to the system can of themselves undermine resiliency. Thus food insecurity and deficits, for example, is an ongoing issue due to a variety of interacting dynamic pressures.

Pastoralism in Ethiopia is both 'viable' and 'vulnerable' (Lautze *et al.*, 2003, p. 24) and pastoralists such as the Borana can become less 'vulnerable' given the right supports and incentives. One way 'viability' can be improved is by protecting and supporting livelihoods.

Chapter 4 – Pastoralists' livelihoods in the Borana region

The viability of livelihoods in the Borana region in part depends on building resilience to the many vulnerabilities which pastoralists face. The PAR model has demonstrated the causes of some of these pressures and resultant outcomes, such as circumscribed and degraded rangelands. The Resilience and Livelihoods (RAL) model will now be used to provide an overview of Borana livelihoods. However, in keeping with the theme of this dissertation, the author will specifically aim to show how the current security of pastoralist assets relates to healthy rangelands. The discussion will focus on core livelihood assets, resources and strategies while noting some of the factors which hamper access to essential resources. The model, as shown below, has been slightly adapted to emphasise these main points from the discussion.

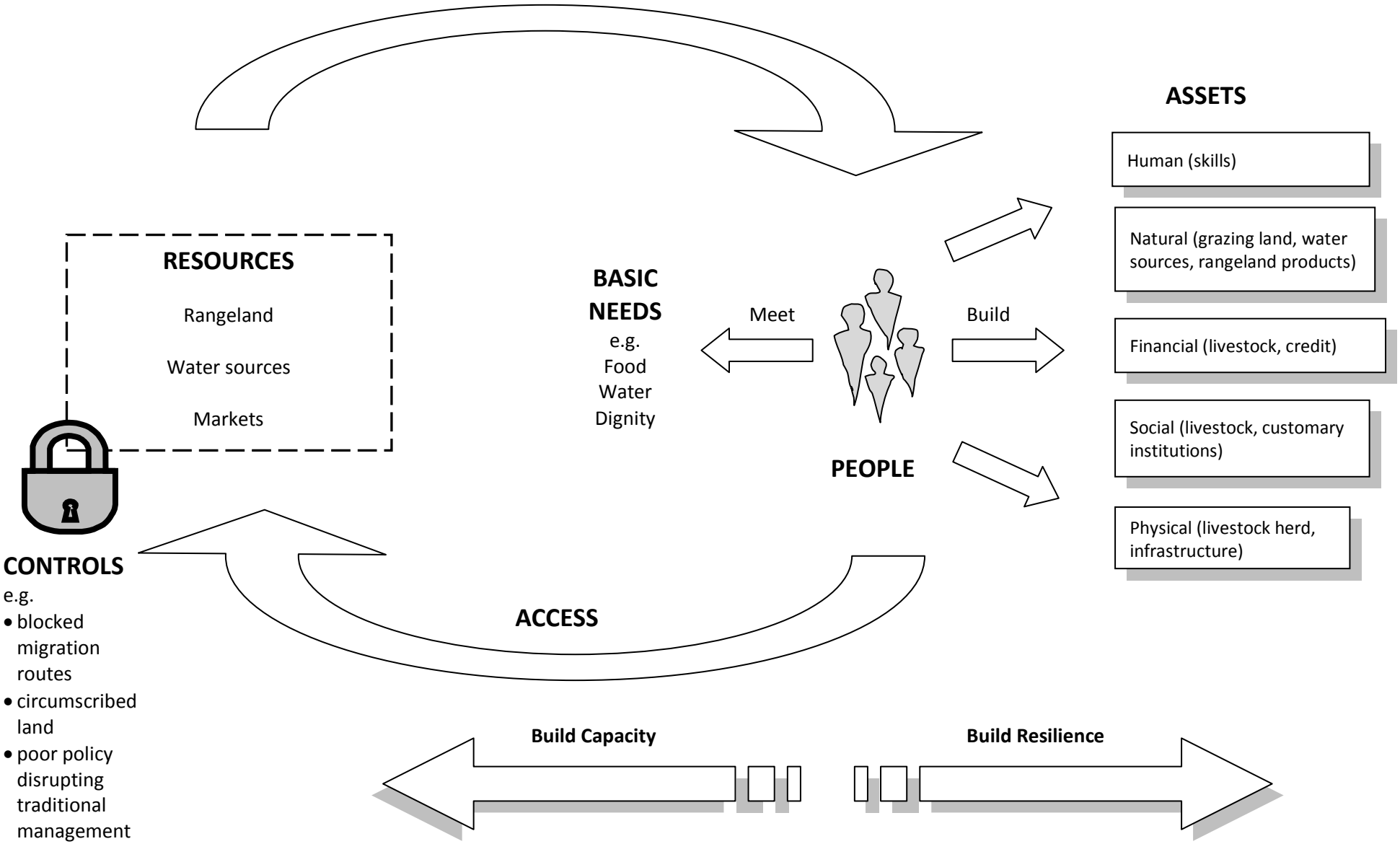


Figure 13: The RAL model showing key aspects of the livelihoods of Borana pastoralists

At the heart of the model are 'people'; in this case Borana pastoralists. For the purposes of the model, they can be thought of in terms of individuals, households or larger community groupings. People own and build assets, the basis for their livelihood strategies, in order to improve and maintain the resilience of their livelihood. For the Borana pastoralists, 5 livelihood assets can be identified:

1. Human: skills, education, health, nutrition
2. Natural: grazing land, water sources, rangeland products
3. Financial: livestock, credit
4. Social: livestock, community social support systems and customary institutions
5. Physical: livestock herd, infrastructure

The RAL model shows how as these assets are built up, so resilience also increases.

4.1 Livestock – the basis of pastoralist livelihoods

The main livelihood base for Borana and other pastoralist groups is livestock production which as seen above cross-cuts financial, social and physical asset categories. (Berhanu and Fayissa, 2010; CARE, 2008; Gemtessa, 2005, Homann, 2008; Kamara, 1998, Cossins and Upton, 1987). As a key asset, livestock (particularly cattle), are thus a financial asset, serve as a source of food, income and storage of wealth as well as a social asset forming the basis of social relationships through gifts, exchanges, fines etc. (Pavanello, 2009; Watson and Catley, 2008).

As an economic asset, cattle were found to contibute 90% of revenues when commercial plus subsistence production are considered. Gross revenue is divided between that derived from marketing (31%) and that for subsistence (69%) (Coppock, 1993). An average household, consisting of a male household head, one wife, 2-3 children, and possibly some live-in relatives, will depend on their livestock for up to 96% of their food needs (Diriba, 1995 in Kontoma, 2000). Milk is the staple food for the Borana whose diet is 55% dominated by cows milk which may be supplemented by sheep, goat and camel milk. Cereals which constitute 32% of their diet are usually procured by trading livestock products (Cossins and Upton, 1987; Coppock, 1993). Livestock therefore fulfil the basic need of food

and are fungible in a way which provides for other basic needs. A study in the Dhas, Dhoquolle, Dubluq and Romiso sites of Borana revealed that cattle off take rates of <10% serve the purpose of grain purchases, clothing, replacing stock, and tax payment, and the occasional medical need (Berhanu and Fayissa, 2010).

Given the importance of livestock for consumption and trade needs, livestock can be seen as a good measure of the wealth status in a community and of the well-being of households. The importance of livestock for pastoralists' economic well being is indicated in the below example which shows that the contibution of livestock reaches as high as 90% in the annual income of the rich, medium, and poor of the Dhasi community in Borana:

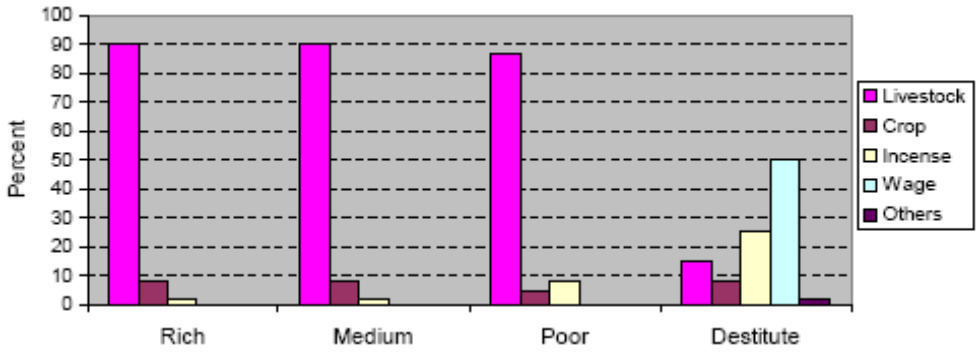


Figure 14: Sources of income by wealth group in Dhasi pastoral community, Borana (source: Gemtessa, 2005)

As can be seen, those pastoralists who can no longer rely on livestock as a primary source of income quickly become destitute in the Borana context.

Livestock also serve the financial role of a bank. They are traditionally seen and used by the Borana as a store of wealth[18]. Marketing rationale suggests that pastoralists prefer to avoid cattle sales in light of the need for animal accumulation. They tend to sell mature males as the income from these is enough for the dual purpose of then replacing stock by procuring calves, as well as for procuring the other goods needed. More recently, however, increasing numbers of immature cattle in markets are an indicator of increasing poverty as these unfattened animals can usually only meet cash needs (Coppock, 1993). Moreover, the pastoralist conventional strategy is to encourage sufficient herd build-up to enable them to

[18] Pastoralists in four sites in Borana were interviewed regarding their most preferred way of asset holding and the majority indicated that they would prefer to hold their assets only in livestock form. Only 28% were positive about saving in banks (Berhanu and Fayissa, 2010).

survive drought periods, thus large numbers of livestock are seen as an insurance against drought.

Livestock are also an important social asset. An anecdote to illustrate this comes from my fieldwork in Borana where I was suprised to see large mounds of manure piled up outside villages. 'Wouldn't it be better if it were left on the ground as fertilizer' I asked. But no. The community facilitator explained that dung outside villages serves as an indicator of community wealth. Wealth and status are similarly reflected on the graves of well-to-do individuals. These are decorated with white stones which in a similar way indicate livestock wealth, but pertain to an individual. Ownership of livestock, and particularly cattle is not a mere property ownership category, but carries a strong identity value among pastoralists which reflect both dignity and social standing and contributes to social and economic well-being.

Figure 15: Dung heap wealth display outside a village (photo courtesy of Craig Leggett)

4.2 Rangelands - the foundation for livestock husbandry

The Borana pastoralist dependence on livestock in turn means a dependence on rangelands which can sustain them. For the Borana the key natural assets are therefore sufficient grazing and browsing for livestock as well as water and minerals (Borana elders, personal communication).

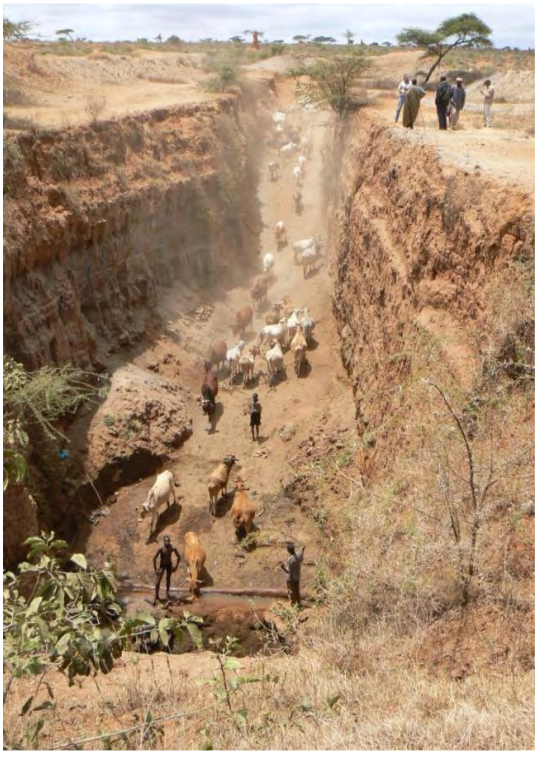


Figure 16: Watering cattle at tulla wells in Dubluq

The Borana have managed to maintain a semi-sedentary lifestyle due to the presence of a number of natural water sources, such as the Dawa River and ponds, as well as a permanent water supply from the traditional deep wells (*tuula*). These are carved out of rock and reach

over 30m in depth. The wells are located at nine complexes, which include up to 30 individual wells, along a central limestone valley (Homann, 2004; Borana elders, personal communication). Customary institutions have traditionally controlled access rights and these are often still intact unless, as in the case of the *Goof* and *Lael* wells, the land they occupy is granted by the government to another group (see under root causes, chapter 3). Physical access to natural water sources and wells, however is increasingly hampered by blocked migration routes as a consequence of agricultual expansion and other trends.

The Borana rangelands are dominated by tropical savannah vegetation, with varying proportions of open grasslands, and perennial herbaceous and woody vegetation. Perennial grasses are particularly good for cattle and sheep, and other areas offer different vegetation types for browsers such as camels (Homann, 2004). Ecological degradation has become a major threat to grass productivity, however, and includes the encroachment of woody species. A growing livelihood strategy to contend with this trend is to integrate camels and thus exploit different feeding behaviour, endurance and spread risk[19] (Kaufman, 2003 in Homann, 2008). Borana pastoralists are specialised in cattle production, however, and the loss of grasslands undermines the security and resiliency of their livelihood system.

The rangelands also offer products such as incense and gum which are traditionally traded offering an alternative source of income. Honey is also harvested in some areas (Wren, 2009).

The natural assets of grazing land, water sources and rangeland products are key to the pastoralist livelihood system and yet *access* to these resources is increasingly hampered by, amongst others, environmental degradation, agricultural encroachment, conflict and population pressure. Such land issues are a well known determinant of pastoralists' vulnerability and often underlying these factors are political marginalisation and poor policies in relation to pastoralists (Pavanello, 2009).

4.3 Social institutions and human skills – indigenous knowledge and natural resource managment

Amongst important human and social assets for the Borana are the skills imbued in the individual and institutionalised in customary institutions for natural resource management. Natural resource management (NRM) is an integral part of the pastoralist livelihoods

[19] About 20% of households currently own camels (Gemtessa, 2005).

strategy and in order to avoid their resources becoming degraded or limited, the Borana have evolved a series of specific livelihood strategies which they attempt to maintain but with increasing difficulty. In order to provide insight into how these skills operate, the system will be described as it stood 30 years ago, prior to the start of external interventions, before highlighting the elements of this knowledge which continue. Today the skills from this knowledge are practised with differing degrees of intensity across Borana. Where the ability to practise traditional natural resource management has been curtailed there are clear signs of land degradation (Homann, 2005). The continuation and implementation of this knowledge is important for the sustainability and resiliency of the Borana livelihood system, and the rationale behind it can be usefully harnessed for development interventions in rangeland management.

4.3.1 Movement, flexibility and area

To capture sustainable grazing conditions, herders rotated livestock from one landscape to another allowing the grasslands to rejuvenate (Oba, 1998). The rotation area was vast. The 100,000 km^2 of Borana land was divided into 5 production systems (*dheeda*), each containing minerals, pasture and water[20].

Grazing was done within and between these 5 landscape categories (Homann, 2004b). Low population pressures and vast areas for movement ensured that land was rarely over-exploited. The maximum distance over which cattle could move in one day, for example was up to 18 km (Oba, 1998). The grazing land was further divided into wet and dry season areas. The former were larger, and had short-term usage giving the land ample recovery time.

The dry season areas were based around permanent wells and were often overstocked during the dry season (*ibid.*), however due to their importance , customary institutions ensured that the areas were given sufficient time to recover (Abay Bekele, ACDI/VOCA, personal communication). Communal land tenure also meant that herds could move flexibly and freely within the designated wet and dry season grazing areas.

Once pasture in a certain area was exhausted, a scout would be sent out to identify new grazing land. Determinants included; height of grass (up to ½ m); and ideal grass types,

[20] Following a meeting with *gaada* elders, these 6 regions have been verified as Gomoole, Malbe, Golboo, Wayama, Dirre and Liban (personal communication, Aliyu, ELSE project manager, CARE Ethiopia)

e.g. *matagudeesa* (*cenchrus ciliaris*), known to be particularly good for cattle in Borana (Borana herder, personal communication). By waiting for grass to reach a certain height, the system ensured that a rich vegetation land cover had time to evolve. While good for the cattle, which depend on different grass types to meet different needs, the system also ensured a healthy ecosystem.

The village herds were also split between *warra* (all year grazing areas established around the villages to a radius of 16km) and *forra* (satellite herds which range across the *dheedas* depending on forage and water distribution) (Homann, 2004b; Oba, 1998). The *warra* herds consisted of young, weak and sick animals and milking cows which provided milk for the households. Thus the land around the village would only be used to support animals needed by households on a daily basis or those unable to move large distances.

These animals would be moved to the *forra* herd when appropriate in order to prevent unnecessary grazing pressure in village areas. Moreover, villages would be moved every 5 to 8 years, and with it the *warra* herd would gain access to new pasture (Homewood, 2008). On reaching a certain herd size *forra* herds would be split with the castrated males being moved into the rich *wayama* pastures[21] (Homann, 2004b).

By moving the animals regularly over a vast rangeland area, pastoralists were not only able to access all the essential ingredients for their livestock (water, pasture, minerals), but also ensured the regeneration and protection of the resource base. Herd splitting further ensured that areas were not detrimentally overgrazed.

4.3.2 Herding

Households often stocked herds of between 50 and 1000 heads of cattle[22] and these numbers were sustained by the *buusa gonofa* system whereby the livestock wealth of a household was redistributed following losses, thus ensuring an equitable distribution of wealth. Household herds were often combined creating an effective force of hoof action and fertilization across the landscape.

An elaborate management system which worked at the *dheeda* down to the village level, ensured that the herds were coordinated. For security reasons, as well as for resource

[21] *Wayama* is a specific grazing region within Borana Zone.
[22] It is difficult to estimate herd sizes in the past, but average size probably falls between the figures as given, as corroborated from conversations with experts in the field.

management, household herds were combined and moved together to the new grazing sites (Abay Bekele, ACDI/VOCA, personal communication). Grazing almost down to the ground encouraged the growth of strong, young, new shoots preferred by cattle, leaving a minimal amount of old grass growth, but enough for roughage (Borana elder, personal communication).

4.3.3 Water

A mentioned, the *tuula* wells are central to the functioning of the Borana pastoral system and it is these wells which established stable patterns of resource use (Homann, 2004b; Oba, 1998). As a result, the Borana have developed an elaborate water management culture compared to other pastoral communities of East Africa.

For them water is not only a resource, but also a *tool* for range management. It is the capacity of the wells to provide water which determined the livestock and human populations that can be supported by the surrounding rangelands. The right of free access to water and pastures for every member of the Borana was therefore limited by trusteeships for each well held by a specific clan. Water management at the level of the clans was supported by institutions determined locally by special elders' committees who coordinated the access of cattle to each well with the use of nearby pasture.

4.3.4 Fire

Traditionally, relatively small areas were burnt to enhance grass growth (e.g. in Dambela Dibayu of Dikale district where it spread across a distance of 7km). This was done once a year, just before the growing season to ensure quick grass recovery (Borana elder, personal communication).

4.3.5 Customary institutions

As noted in a Consultative Group on International Agricultural Research (CGIAR) research brief, 'greater cooperative capacity leads to lower stock densities and greater mobility' (McCarthy, 2005). The effectively functioning institutions of the Borana are often accredited with the maintenance of healthy rangelands (e.g. Homann, 2004), through the effective

coordination and planning of herd movement across the Borana rangelands and for the equitable management of water resources.

The *jaarsa dheeda* (council of the *dheeda*) had a pivotal role in ensuring the organized mobility of herds in the customary pastoral system. Along with the *jaarsa maada* (council of the water point rangelands) they would decide in which direction herds should travel (based on assessments by scouts), how they should be coordinated, and when they should move. Meanwhile, the responsibility for small scale land use planning was conferred to committees at the area level (*jaarsa ardaa*) and village clusters (*jaarsa reera*).

Well access was tightly controlled. The *tulla* wells, vital for dry season grazing, had a strict hierarchy of access according to clan membership or alliance, and the herd owner's relationship to the founder of the well. The clan-appointed managers (*aaba heerega*), establish a water rota for users, while the proper usage of the well is ensured by *hayu* councillors (Oba, 1998). Furthermore, in Borana law, no villages could be built within a 10-15km radius of the wells, thus preventing overgrazing in the surrounding land and fouling of the water. By ensuring strict management of this vital resource and the surrounding grazing areas, the Borana thus ensured the sustainable usage of this natural resource.

4.3.6 Continuities

These rangeland management techniques are still very much a part of the Borana pastoralists' herding rationale and continue to be practised across Borana but to varying degrees. Where they can no longer be instituted there is a loss of knowledge - because pastoralists today no longer have freedom of movement across the 5 *dheedas*, for example, the younger generation can't always identify or delineate these areas (Borana elders, personal communication). Indigenous knowledge is therefore disturbed as access to resources becomes limited. Skills which are still practised to varying degree in Borana today are:

- Movement of herds across as wide an area as possible (often limited by land issues including agricultural encroachment, imposed borders);

- Movement between wet and dry pastures (when not disrupted by the lure of permanent settlement around inappropriate permanent wells[23]/conflict/blocked access routes);
- Splitting herds between *warra* and *forra*;
- Water point use management;
- Management responsibility for natural resources accorded at village, village cluster, and council levels (although their authority is undermined by the parallel government-instituted PA system, which has tended to focus on public security and political control over consideration of the rangelands (Homann, 2005)).

4.4 Livelihood diversification

Livestock, rangelands, indigenous knowledge and natural resource management strategies constitute the basis of pastoralist livelihoods. As livestock production comes under threat from reducing range land productivity caused by forces such as declining traditional range management systems, increasing populations, etc., one strategy pastoralists use to maintain their livelihoods is diversification (CARE, 2008). In her study of livelihood diversification in southern Ethiopia, Carswell points out that such livelihoods diversification activities are, 'commonly categorised on the basis of their roles as mechanisms for coping adaptation, and accumulation'(2000, p.4). Although better-off households will diversify to accumulate wealth, it has been observed that it is most often poorer pastoralists who have had to diversify their activities in a struggle to survive (*ibid.*, 2004; CARE, 2008). However, diversification is also, 'a cyclical rather than a unilinear process, whereby herders can combine different income strategies at different points in their lifecycle' e.g. a male pastoralist may engage in wage labour to earn income for bridewealth[24] and then later again move back to full-time pastoralism (Little et al., 2001, p. 389). Diversification activities vary widely and include:

[23] Elders and herders from Dida Hara where there is abundant pasture, for example, explained that policy which has provided the area with a permanent well has made the movement of herds back to areas such as the dry season wells at Web no longer necessary. The long term result has been over-grazing and land degradation (Homann, 2005).

[24] Payment made by a groom or his kin to the bride and her kin to legitimise a marriage.

1) Any form of trading occupation.

Most trade comes through selling livestock or livestock products such as milk, butter and ghee at the major market centres for pastoral communities – Dubluk and Mega. However, other, non-livestock-based trade can include crops, charcoal, firewood, wooden poles (for building), chicken[25], gum arabic, incense, alcohol and *khat* (a leafy stimulant) (Little et al. 2001; author's observations). Poorer pastoralists often resort to selling charcoal and other products which they can collect from the rangelands but a government ban on selling charcoal can make this a risky business and incur fines. Nevertheless, the author observed numerous instances of pastoral girls and women standing by the roadside hoping to wave down customers for their large bundles of charcoal.

Markets offer the venue for trade while roads help with access (and informal roadside business opportunities) and are therefore both important resources for pastoralists. Physical access and profitability do not always work in the pastoralists' favour however. For example, people living more than 40km (which is over a day's walk) from markets have less opportunity to trade since they have to take into consideration the difficulty of transporting goods, goods which spoil easily and the benefits of making this effort for things which may generate only little income (Little *et al.*, 2001). Furthermore, markets may not always offer the best terms of trade for pastoralists. The terms of trade for livestock for example, have been unfavourable when compared to grain. Investment in livestock marketing by the government has been insufficient and Borana pastoralists have reported that their own efforts in creating new market places were labelled illegal (Homann, 2005 p.71). Of increasing importance for improving income generation activities are community based organisations (CBOs). During the last few years many have been established in Borana by the community, government, and different NGOs to help overcome market failures and share the resources of their members (CARE, 2008). Through these efforts access to the benefits provided by markets is being improved.

[25] Chickens are not traditionally kept by the Borana as they had no use value. Neither they nor their eggs were eaten due to a Borana view that they are, 'too much like humans' walking as they do on 2 legs (Borana herder, personal communication). These views are now changing, however, and chickens are increasingly kept and traded.

2) Crop cultivation

This is increasingly practised by pastoralist households who can no longer live off their animals alone. Crops are grown both for subsistence and for cash incomes and are the second main income generator after livestock. Yet crop production, as noted, is unreliable due to the unreliability of rainfall in Borana areas.

3) Wage employment

This may be both local and outside the area and can include working as a hired herder, farm worker, and migrant labourer. Again opportunities for waged employment are often affected by distance to urban centres. Diversification away from livestock generally parallels with decreasing wealth within pastoral households and wage labour (along with petty trade) tends to increase among poorer herders (Little *et al.*, 2005)

4.5 Conclusion

The livelihoods of Borana pastoralists are based on a number of key assets including, as discussed here, livestock, rangelands, natural resources such as water, and customary knowledge and skills. As shown in the LAR model, these assets are essential to meet the basic needs of food, water, dignity and general well-being. Various pressures and access considerations are undermining the security of these assets leading to diversification activities which in turn encounter their own challenges. In order to build capacity, access to resources must be improved and in order to build resilience pastoralist assets need to be better secured. There are many interrelated activities which NGOs and government pursue towards this goal. An important advocacy activity, for example, is to improve policy to be more favourable towards pastoralists. This dissertation, however, focuses on ways to improve rangeland condition as a means to better secure this basic asset and thus ensure better grazing and browsing access for livestock – the mainstay of pastoralist livelihoods. Such measures contribute to building the resilience of livelihoods for Borana pastoralists.

Chapter 5 – Rangeland Management approaches in Borana

In order to maintain healthy and productive livestock (and livelihoods) for Borana pastoralists, there is a pressing need to ensure that the grasslands available are well managed. As we have seen, the Borana rangelands have traditionally been managed by customary institutions, but with the onset of various pressures, this management system is increasingly undermined. In the past 'imported' approaches to rangeland management in semi-arid regions like Borana haven't helped the situation. Two important, Western-led concepts have affected government and NGO policy regarding rangeland management to a greater or lesser degree: 1) the equilibrium model, and 2) the 'tragedy of the commons'. The equilibrium model was developed in the relatively stable and predictable western temperate ecosystems and assumes predictable forage production. In this model the equilibrium of the eco-system becomes unbalanced when animal populations exceed a certain number and overshoots the 'carrying capacity' of the land. Thus livestock stocking densities are seen as a contributing factor to bush encroachment and with it land degradation. Hardin's (1968) 'Tragedy of the Commons' postulated that, with livestock owned individually and rangeland held in common, the incentive for individual profit inevitably drives over-stocking and environmental degradation at the expense of the group (Homewood, 2008, p.5).

The thinking behind these two models has for a start underpinned, 'national and international policy pressure to privatise rangelands . . . with drastic implications for individual, household and group access to the basic means of pastoral production and associated livelihoods' (*ibid.,* p. 5). The repercussions have included a misconception of range ecology which has led to ideas that pastoralists maintain livestock far above the carrying capacity of the rangeland and hence run a risk of permanent land degradation. To avoid this, de-stocking and state controlled grazing schemes or ranches were imposed based on western ecological models of carrying capacity (Scoones, 1996; Elias, 2008).

More recently work has generated a new debate on the limitations of both models. The influential work of Ellis and Swift (1988), and Westoby *et al.* (1989), for example, has provided the alternative non-equilibrium model to understand savannah ecosystems like Borana. In this model the non-equilibrium behaviour of savannah ecosystems implies that

they are less predictable, with limited capacity for being influenced by stocking density (Angassa, 2007). This model implies that rainfall variability and time are more important in driving bush encroachment than excessive grazing pressure (*ibid.*). Moreover, there is increasing scientific evidence that show that pastoralist rangeland management strategies, such as animal movement (rather than grouping into ranches) are good adaptations to these unpredictable environments and that carrying capacity is irrelevant to such environments (Behnke and Scoones, 1993). The tragedy of the commons concept has similarly been challenged with recognition that the pastoralist management system works for the good of the community and that it cannot support the individualisation of interests[26].

Nevertheless, elements of the equilibrium model and tragedy of the commons thinking continue to affect policy, as seen by the support of ranching. NGOs and other actors are taking on board the lessons learned from these debates and are increasingly incorporating these lessons into their ecological thinking and ensuing strategies for developing pastoralist rangelands. More work needs to be done on this front – as noted by the Natural Resource Management Advisor at SCUS Ethiopia, for example, more scientists are needed on the ground to properly assess the ecology of rangeland dynamics (Fiona Flintan, personal communication). Importantly for now, however, work stressing the value of indigenous knowledge in establishing appropriate rangeland management strategies is gaining increasing prominence (Homann *et al.*, 2008; Oba, 1998; Angassa, 2007, Wezel and Haigis, 2000). On the basis that pastoralists have a good understanding of how their environment works and how to manage it, organisations such as CARE Ethiopia, amongst others, are incorporating customary rangeland practices into their rangeland management strategies. Following on from the above debates and new thinking in rangeland management approaches, beneficial lessons which should be kept in mind regarding rangeland management are:

- The Borana rangelands are a disequilibrium system. Heavy grazing alone, therefore, does not promote land degradation and disturbances may have a beneficial rather than detrimental effect.

[26] In Northern Kenya, for example, the pastoralist system is breaking down, with the partitioning and individualisation of the rangelands being a major contributing factor.

- Traditional rangeland management techniques have developed to optimise rangeland productivity for the benefit of pastoralists' livelihoods. Lessons can be drawn from Borana pastoralist management strategies.

5.1 Technical approaches to rangeland management

International NGOs, such as CARE, SCUS, Action for Development (AFD) and SOS Sahel, are working to improve rangeland management in Borana where there are issues of bush encroachment and land degradation. The following discussion will look at the relative merits of some of the technical approaches being implemented, based on interviews with pastoralists, representatives from the above-mentioned NGOs and research literature.

Encroaching woody species are recognized as reducing grazing land through colonising rangeland, as well as out-competing herbaceous grasses for nutrients, thus reducing grass cover (and feed for livestock). The proliferation of woody species is thus seen as a cause of land degradation. Changes in grazing patterns, due to vulnerabilities which constrict rangeland usage, appear to be exacerbating the effect and heavy grazing in areas seems to encourage further bush encroachment. While the spread of woody plants are a symptom of wider vulnerability issues, the net result is that they further the effects of fragmenting rangelands. Technical approaches have thus been geared towards counteracting the proliferation of these plants and encouraging grass growth through the following main approaches: 1) Prescribed fire, 2) Hand cutting woody species, 3) Enclosures (*kallos*), 4) Reseeding.

5.1.1 Prescribed Fire

Fire is a key environmental driver that controls the function of savannah ecosystems. It was a tool used by Borana pastoralists to suppress bush growth by killing encroaching woody species. Suppressed by the government in the early 1970s, it is now being slowly re-introduced (Angassa and Oba, 2009). Conversations with pastoralists revealed that burning also gets rid of ticks, which infest cattle, and produces sweet grass for animals (Borana elders, personal communication).

When asked, Borana pastoralists said that they believed that the ban on fire had adversely affected the overall productivity of the rangelands (Borana elders, personal

communication). Since fire had been used traditionally, they also preferred the idea of this rangeland management tool as it echoed one of their own practices with associated good results (Mitiku Tiksa, Field Manager Borana, SOS Sahel, personal communication). Bearing these factors in mind, NGOs are re-introducing burning as a rangeland management technique through 'prescribed fire' - the controlled and managed application of fire to defined units of grassland.

However, some of the long-term consequences of fire are drying of the land, reduction of plant cover and loss of nutrients (Hatfield, personal communication; Demeke, 2009). Moreover, fire treats the symptoms of land degradation rather than the underlying causes, thereby becoming more and more necessary since the problem will persist (Hatfield, 2009). Practical considerations, mentioned by pastoralists and development staff alike, are that the fuel load (ground cover) is now so patchy that it can be difficult to get a fire started and maintained. Moreover, the proliferation of villages in the area could constitute a hazard should fires get out of control.

As a tool on its own, fire may not have long-term sustainable benefits, but it is an approach favoured by pastoralists and has worked well as a short-term, repetitive strategy in the past. Taking this into account, one option is to combine prescribed fire with grazing animals, following a period of rest. This concedes even more with traditional pastoralist practice and allows the fertilization and conditioning of the soil through hoof action and dung, thus encouraging re-growth. In a practical study conducted to compare the merits of different rangeland management systems, Angassa found that combining fire with grazing achieved a restoration of herbaceous plant diversity (Angassa, 2007). Precautions would have to be taken however to ensure that burning is kept within prescribed areas as not all areas are appropriate (Getachew Gebru, Pastoral Risk Management Program, ILRI, personal communication). As noted by Cary Farley of the ELMT/ELSE project, amongst others, we still don't have enough knowledge of the impact of fire on unwanted bushes and desirable grasses as there hasn't been sufficient monitoring of its effects. It is therefore an area requiring further investigation in order to determine its suitability for the changing ecology of today's Borana rangelands.

5.1.2 Hand cutting woody species

Hand clearing woody species involves pastoral communities in physically cutting down unwanted trees. This method is more discerning than fire since trees can be selectively cut, rather than indiscriminately burned – some trees e.g. the shepherd's tree, are useful animal fodder. Prior attempts to address bush encroachment in this manner involved intensively cutting large areas of bush. This method, however, has been found to have limited impact since most of the invasive species re-sprout after cutting (Demeke, 2009). 'Tree cutting is not working', explained a herder involved in one of the latest projects, 'trees grow too fast . . . cut one, another grows' (personal communication). After 15 years of experience following this method, SOS Sahel has given up since, 'plots which were cleared then are now again overgrown with acacia' (Mitiku Tiksa, SOS Sahel, personal communication). Some other drawbacks to the method include Angassa's observation, that since the method is labour intensive and trees have to be regularly cut, it would only work for land which was easily accessible. For practical purposes, therefore, tree cutting wouldn't be a method which worked for vast swathes or rangeland, but rather for designated areas near settlements which could serve as reserves for the weak or sick animals. Another issue raised by Mitiku Tiksa was that the system is also ineffective long term since it is not part of the pastoral production tradition to clear trees and is therefore a difficult habit to ingrain.

As in the case of prescribed fire, a mixture of approaches appears to be more effective in reducing bush cover, (i.e. cutting trees followed by fire, cutting trees followed by resting the land etc.), although in most cases organisations are still experimenting with the most appropriate combinations of approach.

5.1.3 Enclosures

In response to changes in land use, the Borana revised the traditional system of grazing reserves specifically set aside for calves and weak animals (*kallos*). These tended to be open pasture in key grazing landscapes such as hill tops and valleys and were set aside for calf and weak animal grazing through community consensus. Some of these areas have been converted into crop land, but others have been preserved by households as traditional calf-grazing reserves. In order to protect them, the areas have been enclosed by perimeter fences (Oba and Angassa, 2008). Drawing from these practices, NGOs such as CARE and

SCUS, have helped establish new enclosures by facilitating village level meetings to agree on land which can be put aside for this purpose. The land is then enclosed with thorn fences to prevent un-condoned grazing. By reducing grazing pressure the land can 'rest' and recuperate. In order to rid the area of woody species, the area is also usually hand cleared of trees.

These enclosures are in keeping with traditional practice and pastoralists interviewed generally seemed happy with the results. Because they are labour intensive, however, again this system can only work for areas close to villages for maintenance purposes, and pastoralists would need to keep up the incentive to regularly clear invading bushes. Closer inspection of the land by holistic management consultants found that this protected land still showed signs of degradation with grasses growing in patches and hard, compacted soil acting as a deterrent to water absorption. A study of the long-term consequences of treating land in this way also revealed that the proliferation of bush encroachment is a major threat in these enclosures over time, as compared to more regularly grazed rangelands (Angassa, 2007).

In maintaining *kallos*, time is an often a mismanaged element – the *kallos* should be left for long enough to recover, but not for so long that they start to deteriorate, as seen in a private ranch where 15 years of underuse have led to steady bush encroachment. Grazing animals should be reintroduced in a timely manner so that biological processes can again take place. These *kallos*, might also be used as a dry season grazing reserve in times of drought when the large numbers of animals would attract huge numbers of ticks. Prescribed fire could help to control this particular phenomenon (Biruk Asfaw, SCUS, personal communication).

Enclosures help protect land to a certain extent, but as with the other approaches, are more effective when combined with other techniques such as bush clearing. In order for the enclosures to be sustainable over time they also require careful management.

5.1.4 Reseeding

Reseeding involves collecting seeds from existing grasses and then sowing them on bare ground. This approach has had only minimal attention and results to date. Positive results came from one experiment conducted by the Oromiya Agricultural Research Institute, but a

similar attempt by Action for Development proved unsuccessful. This method assumes that the dearth of grasses is due to a lack of seeds. Often, however, seeds are readily available and are still in the ground, but they do not have the right conditions in place to grow. The reseeding approach would involve ground preparation using fertilisers and ongoing nurturing, as well as encouraging pastoralists to collect enough seeds in the growing season to sow the land when needed – one obstacle which Action for Development ran into since the concept was still new to pastoralists. This approach could be considered in particularly barren areas, but would be labour intensive, not particularly cost-effective and would have to first be taken on board by the pastoralist community.

5.1.5 Conclusion

The technical approaches to rangeland management described above, particularly prescribed fire, cutting trees and enclosures, are 'providing some relief' to the problems of rangeland degradation (Aliyu Mustefa, CARE Ethiopia, personal communication). The pastoralist management techniques of prescribed fire and preserving enclosures for use at specific times or for specific animals have been shown to improve grass production. These methods are also preferable since they do not introduce new systems of management into the Borana system, but draw on existing practice. On their own, however, they do not *systematically* improve grass production and need to be combined with other strategies such as resting the land, grazing or with each other techniques as well as ongoing management, in order to give better results. Moreover, they tend to address the *symptoms* of land degradation rather than the causes – bush encroachment, for example, is the consequence of drier ground, a consequence of ongoing exposure to fire and changing grazing patterns. So bush encroachment will continue to be a *symptom* which has to be dealt with.

NGOs are still experimenting with ways to improve the quality of the rangelands and at this stage what is needed is more input from ecological experts, more experiments on permanent bush reduction, and more holistic thinking – the rangelands have been managed holistically for centuries and to impose one technical approach e.g. fire, without other considerations of what is needed, is out of keeping with both the traditional way of managing rangelands and with establishing sustainable, self-perpetuating healthy

grasslands. A holistic-thinking approach which takes account of livestock, pastures and people is advisable to avoid further damage to an already fragile landscape and livelihood.

5.2 Introducing Holistic Management

The above approaches attempt to fix the *symptoms* of land degradation. Holistic Management (HM) addresses the *problem* by looking to the broad range of factors which affect ecosystem health and trying to re-establish a balance by using a variety of tools in combination – animals, resting land, time, and people. The HM concept was conceived of by Zimbabwean farmer, soldier, politician, and environmentalist Allan Savory who spent years studying the problem in Africa. From case studies he made of land degradation across the globe, he concluded that the one common denominator to the problem was human management and decisions (Savory, 1999). He argued that in degraded landscapes the fundamental processes which drive our ecosystems have in one way or another been disrupted– the water cycle (the cycle of water from the atmosphere to the surface and back to the atmosphere), the mineral cycle (minerals follow a cyclical pattern as they are used and reused by living organisms), energy-flow (how energy is employed as it moves through the ecosystem) and the dynamics between living organisms in a specific environment. With proper understanding of ecosystem dynamics, these interactions can be re-established.

Through years of experience, pastoralists such as the Borana, had already naturally harnessed this management concept and codified it in their customary land management practices. However, as discussed, external factors have undermined its comprehensibility. Many of the insights HM provides are thus in fact known by communal pastoralists, yet at the same time, proper application of the principles has been either lost or become increasingly difficult in modern times. As we have seen, the Borana pastoralist system was dynamic involving herd mobility, and had a management system in place which was highly attuned to the state of the rangelands and usage was adapted accordingly. It was characterized by a complex set of practices and knowledge that permitted the maintenance of a sustainable equilibrium between pastures, livestock and people in a 'Triangle of Sustainability'[27]. The primary contribution of Holistic Management is to help practitioners and pastoralists to re-apply the principles under modern conditions and re-establish this

[27] Defined by Koocheki and Gliessman (2005)

dynamism which is so important to rangeland health. Holistic Management does this in three ways:

1) It confirms the principles for optimal grazing, which lay the *technical* basis for transforming degraded lands back to highly productive lands. The analogy to illustrate the point is of the Serengeti migration where 1.5 million wildebeest and 1 million zebra, 'act as combine-harvester, plough, seed-planter, soil aerator and fertilizer – at minimal financial cost' (Hatfield, 2009). The mouths, hooves and dung of animals are thus all seen as *tools* which can contribute to improving range condition and help with the fundamental ecosystem processes e.g. when animals are bunched, hooves churn up hard soil allowing for better aeration and water infiltration and thus encourage the water cycle.

Adapted to livestock, the management task is to get animals to the right place at the right time in the right way and for the right reason. This involves a management plan which takes account of *time* and *movement*. Animals are managed so that their impact encourages an environment which is conducive to grass growth and inhibiting to the spread of woody species. *Time* must take account of how much animal impact (in the form of grazing, hoof and dung action) a piece of land needs in order to recuperate water, mineral, energy and system-dynamics. *Movement* means that animals are rotating according to a grazing plan, much as crop rotation, in order to give a piece of land first the necessary 'animal treatment' followed by a period of rest[28]. The details are technical, but the main point is that the concept encourages pastoralists to graze their herds bunched together (rather than spread out as in current practice) in a defined area, before moving them on to a new grazing areas according to specific timings – a concept familiar to pastoral communities in Borana for whom it echoes their own traditional rangeland management techniques.

2) It gives insight into the effects of the other tools being used in rangeland management on the health of the ecosystem e.g. the long-term disadvantages of fire-maintained rather than animal-maintained grasslands, the negative impacts on rangeland productivity by excluding grazers, and the tendency of perceived solutions such as bush clearing to treat the

[28] Ideally for plants in the Borana ecosystem, 36 to 65% of the grass should be eaten before cattle are moved off. The plants should then be free of grazing for 6-9 weeks in order to recover and grow back with enough energy store to stimulate healthy growth again following repeated grazing (Leggett, personal communication).

symptoms of land degradation rather than the underlying causes (Hatfield, 2009). While tools such as fire can certainly be incorporated into the HM plan, it should be done in balance with other ecological considerations e.g. how much animal fertiliser the land should then receive in order to recuperate. It would also constitute a fall-back option since in an environment where grass for fodder is precious, 'better that it goes into the belly of an animal than up in smoke' (Hatfield, personal communication).

3) HM uses a simple decision-making framework, which emphasizes the management basis for applying grazing principles (Hatfield, 2009). Examples worldwide have shown that when followed these grazing principles succeed. The most challenging aspect of HM is that it requires a considerable degree of management skill, time and effort. This can be challenging in communal settings where cooperation, joint planning and multiple managers are required. However, for the Borana, the customary management system involved many of these principles and so again the concept is a familiar one.

Holistic Management has had proven good results in different parts of the world, although it is still being introduced in Africa. Nevertheless, here too the results are promising as can be seen from the below series of photos recording range recuperation in a site in Zimbabwe:

Figure 17: Before herd impact, during drought. This area had been hard and bare for several decades and was believed by many to be beyond land reclamation (Source: Holistic Management International)

Figure 18: After herd impact, during drought. The same area 6 months later. (Source: Holistic Management International)

Figure 19: The same land 2 years later (Source: Holistic Management International)

Holistic Management offers a way of managing the Borana rangelands which in many ways coincides with traditional management practices as it draws on concepts used by and familiar to pastoralists:

- Movement,
- Bunching animals,
- Resting land,
- A decision-making framework.

Animals are a core part of pastoralist livelihoods and have traditionally been used as part of an 'animal, land, people triangle' to manage rangelands. Holistic Management draws on this relationship and encourages it.

CARE Ethiopia has been the first to introduce HM to Ethiopia. Recently (summer, 2009) CARE has established two learning sites in Borana with the communities of Dikale and

Dambala Dhibayu as a strategy to improve the condition of rangelands. The author of this dissertation was involved as both communities were introduced to the key concepts and management approaches needed for HM by consultants Richard Hatfield and Craig Leggett. Both communities quickly caught on to the idea and were interested in trying the system out in their respective *reeras*. It was clear in discussions that HM concepts were familiar to them. Comments made by pastoralists during these introductory sessions recognized that HM was a management system that the communities could potentially maintain without dependence on imported materials or experts (following initial training), that HM thus gave them ownership, that there would be no costs involved and that they did not have to destock animals to reduce grazing pressure (Borana pastoralist group meetings, August-September, 2009). At the time of writing, a rotational grazing system has been established in Dikale and is being managed by pastoralists with initial guidance from Craig Leggett[29]. The same is to be implemented in Dambala Dhibayu.

In Borana so far, there has been a positive response to HM. However the experiment is still in its early stages and depends on the community holding together a clear vision of what they want to achieve, accompanied by strong management. Time will be the judge of how successful Holistic Management will be in this context, but the early signs are positive.

5.3 Conclusion

Various different techniques are being employed to improve 'access' to the rangelands by improving rangeland condition. Each has different pros and cons, and so should be used appropriately. Fire is good for managing large swathes of land, is acceptable to people, particularly since it echoes traditonal practice and could be managed (and therefore owned) by the community. It does, however dry the land and so would require a management plan which could recondition the land following. Cutting trees has succeeded in clearing areas of unwanted woody growth, but since it is labour intensive would have to be employed close to settlements. Communities have taken this practice on board. Spurred by initial good results they have organised themselves into clearing more areas. Longer-term results can be discouraging for people, however, when trees quickly regrow. Organisations are looking into

[29] Both HM consultants will visit on a regular basis as the process is established to monitor progress, provide further training and revise the way in which animals are moved as the grasslands begin to respond.

ways which get rid of trees more permanently e.g. by combining cutting with burning, or chemical treatments. A consideration when introducing more complex techniques is that for best results they need to be something the community can do, allowing them to 'own' management of these lands. Enclosures, like tree cutting, are good for cordoned areas close to settlements and resonates with the pastoralist community. There can be longer-term issues of bush encroachment if land isn't managed properly. Seed redistribution may not be the best approach at this stage, since it can be costly, labour intensive, is out of keeping with traditional practices (and therefore less likely to be taken on board by the community) and has not had consistently good results so far.

These techniques have to date provided 'some relief'. To provide long-term results, however, some important considerations are: that the community can take 'ownership' of the technique; that it is something which resonates with people and which they would be keen to pursue; that the pros of combining different techniques and introducing further lessons from traditional Borana practice are considered (such as grazing); and that the ecological impacts are better understood.

Holistic Management has approached the issue from another angle, looking to the way grassland ecologies function and to traditional grazing management as a way to address the underlying problems of rangeland degradation. It combines animals, land and people in a management framework which draws on Borana customary practices. Providing that the Borana pastoralists maintain the management side of HM the system is bound to work since it constantly considers, adapts to and supports the ecological processes which make for healthy rangelands.

This section has addressed the technical approaches to improve rangelands in Borana. Although not within the scope of this dissertation, it is also important at this stage to note another strategy being employed by NGOs to improve access. This is the attempt to improve *physical* access to and mobility within the rangelands by working to dismantle private enclosures as well as peacebuilding activities by facilitating discussions between groups in conflict. This makes land accessible to the community again and opens access routes. SCUS has already had considerable success in this area dismantling 170 private enclosures in the Negelle area of Borana alone (Biruk Asfaw, SCUS, personal communication).

When asked what they wished for the future, the Borana pastoralists I interviewed spoke of seeing the rangelands once again full of thick grasses and fat, happy cows. The

work being undertaken by NGOs in rangeland health aims to make this desire to some extend a reality, and strenghthens the resilience of Borana livelihoods in the process.

Chapter 6 - Conclusion

The Borana pastoralists of southern Ethiopia are facing increasing livelihoods challenges. Rangelands, a vital natural asset, are diminishing both in size and productivity as a consequence of various drivers of change from historical pressures such as the implementation of poor policies in the region, to increasing population, encroaching agriculture, and factors affecting the ability of customary institutions to deal with stresses such as drought. Assets are vital for the well-being of individuals, households and communities and secure assets contribute to more resilient livelihoods. The Sphere Handbook, for example, highlights the importance of, 'supporting and promoting livelihood strategies' particularly through, ' preserving productive assets or recovering those lost as the result of a disaster' (Sphere, pp. 112 and 120). In order to 'support and promote' the 'livelihood strategies' of the Borana pastoralists, ways need to be found to preserve their productive assets, particularly livestock, and essentially the natural asset of rangelands which they depend on to survive.

This dissertation has sought to demonstrate how the Borana have traditionally managed their rangelands to promote sustainable livelihoods; the pressures the system has encountered and continues to face (thus undermining resilience); and to provide an analysis of Borana livelihoods. A through-running thread has been to highlight the importance of the natural resource base, with a particular focus on rangelands. When this is diminished or affected, Borana lives are directly affected. Having established this, and in the process provided an overview of Borana livelihoods and challenges, the dissertation's aim is to investigate technical approaches which can enhance the condition of the grasslands.

The vulnerability analysis using the PAR model has shown an accumulation of factors which have served to undermine Borana livelihoods. Poor policies and interventions, such as building wells in inappropriate areas, has for example discouraged livestock movement between wet and dry pastures. This has led to overgrazing in well areas and consequently degraded land. Exacerbating such root causes of vulnerability are dynamic pressures, such as undermined regulatory, customary institutions and factors affecting the availability of rangeland such as encroaching agriculture. Superimposed on these underlying issues are a number of at risk factors which conspire to make the Borana pastoralist livelihoods both

more vulnerable to natural hazards such as drought and more generally undermine the traditional resiliency of the Borana pastoralist system.

An analysis of Borana livelihoods is also conducted using the LAR model. In the course of the discussion, the importance of productive rangelands for improving the current security of pastoralist livelihoods is considered. Pastoralists do resort to alternative strategies to support themselves and their families, such as charcoal production, petty trade, agriculture and casual labour, yet it is still livestock which forms the basis of the pastoralist way of life and well-being. Those who have not been able to maintain enough livestock for various reasons, including the collapsed social security system of *buusa gonofa*, have often fallen into destitution.

While NGOs do support diversification activities e.g. developing the marketing of rangeland honey, or working to find livelihoods options for 'drop-out' pastoralists; many activities revolve around the basis of the pastoral economy – livestock. Thus NGOs such as Oxfam, CARE, SCUS, and MercyCorps are engaged in supporting 1) access to markets, 2) strengthening the milk and other livestock products value chain, 3) women's income generation activities based on milk and butter production, 4) conflict resolution to improve access to natural resources, 5) building up customary institutions, 6) veterinary care, 7) advocacy. Improving access to rangelands is an essential partner activity to any of these interventions. Improving access works in two ways: 1) physically extending the area to which pastoralists have access, for example by working to dismantle private *kallos*, discouraging agricultural encroachment and improving security through conflict resolution activities, and 2) by improving the condition of the land to which pastoralists currently have access. This paper has focused on this second strategy.

A variety of technical rangeland management strategies has been examined in order to determine the efficacity of each. In the process the accumulated wisdom of customary natural resource management systems/indigenous knowledge has been considered since it can provide insights into how to manage this specific landscape, provides the basis for a symbiotic relationship between people, animals and land, and when supported could both strengthen traditional institutions and empower the pastoralist community to take ownership of any technical strategy. The strategies currently being implemented range from the use of fire, to cutting unwanted woody vegetation and creating enclosures. Discussions with pastoralists and the natural resource management representatives of NGOs revealed

that techniques which had some basis in pastoral traditional practice were more popular with pastoralists and therefore possibly more likely to be continued long-term. Different techniques are appropriate for different areas for logistical reasons – fire for example can treat large areas away from settlements, whereas tree cutting needs to be practised close to settlements so that tree regrowth can be easily managed. A reservation, however, regarding these techniques is that they treat the ecological symptom rather than the root cause of the problem of degraded land. Recommendations for the development of these techniques include:

- getting more scientific experts on board to improve understanding of ecological processes and how to optimise land condition accordingly,
- conducting further trials to see how effective combined techniques can be e.g. cutting trees followed by burning,
- incorporating the fertilising and ground-conditioning effects of animal herds,
- considering pastoralists' reception of the technique and long-term management options,
- developing thinking which considers the 'whole' – the complex, interacting ecological system – not just the symptoms of degraded land, for long-term, sustainable results.

Holistic Management has been recently introduced to the southern rangelands to approach the problem 'more holistically'. It incorporates some of the above points including a more ecologically-based understanding of the rangelands, putting animals into the process and draws on traditional customary practices (albeit it critically so that practices such as fire are considered for specific and appropriate contexts). For the holistic management approach to succeed the most important condition is that the pastoralists of Dambela Dibayu and Dikale are able to maintain a clear, shared vision of what they as a community want to achieve through this process. This vision keeps the community cohesive as they join

forces to manage holistically. And management is key to the success of this approach. As such, recommendations for implementing Holistic Management are that[30]:

- the community as a whole is encouraged to bear in mind the vision of what they want to achieve,
- in the initial stages HM consultants engage regularly with the community to introduce the techniques and monitor progress,
- local capacity is built by training community facilitators in HM who share technicalities with the rest of the community,
- from the start pastoralists understand that they can be self-sufficient in pursuing this approach since once established, there is no need for outside money or tools.

The vulnerability and livelihoods analyses of this dissertation have shown that there can be little question that improving the condition of the rangelands will also lead to improved pastoralist livelihoods. Livestock form the backbone of pastoralist livelihood strategies and rangelands are the basic resource needed to maintain and nurture this asset. More research needs to be done on how the current technical rangeland management approaches can be optimised to improve the state of the grasslands, but for the moment holistic management offers a promising alternative/parallel strategy. The problems faced by the Borana are experienced by pastoralists across East Africa and further afield. On a forward looking note, the lessons drawn from this study on the livelihoods of the Borana and rangeland management strategies could provide useful transferable lessons for pastoral peoples elsewhere facing similar livelihoods challenges.

[30] The following recommendations became apparent as HM was introduced in Borana. Some were stressed by consultants Richard Hatfield and Craig Leggett, and right at the beginning CARE arranged to have community facilitators send to Zimbabwe for an HM introductory workshop run by HM International.

Interviews

In the course of my work in Ethiopia, the following people were formally interviewed. I would also like to note that informal group discussions with both the Dikale and Dambala Dhibayu pastoralist communities, as well as with other persons not formally interviewed, have rendered insights which have been drawn on for this dissertation.

Pastoralists

Interviewee	Position	Location
Elders	Council	Dambala Dhibayu
Deed Bonaya	Herder	Dikale
Golicha Jatani	Elder	Dikale
Tunale Doyu	Abba dheeda	Dikale

Organization Representatives

Interviewee	Position	Organization
Aliyu Mustefa	ELSE Project Manager	CARE/Ethiopia
Fiona Flintan	NRM Technical Advisor	SCUS/Ethiopia
Biruk Asfaw	NRM Advisor	SCUS/Ethiopia
Mitiku Tiksa	Field Manager, Borana	SOS Sahel
Merkeb Belay	Planning and Research Officer	Action for Development
Abay Bekele	Research Officer	ACDI/VOCA
Getachew Gebru	Research Associate	PARIMA/ILRI

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The photos in this dissertation were taken by the author, unless otherwise stated