Pastoralism and Pastoral Policy in Ethiopia

Text Book for Common Course

2015

CONTENTS

LIST OF FIGURES

LIST OF BOXES

LIST OF TABLES

Acknowledgements

Lecturers from the Universities of Bule Hora, Jigjiga and Samara have produced this text book following an intensive training programme on Pastoralism and Policy delivered by Tufts University and the International Institute for Environment and Development (IIED).

The lecturers were as follows:

Jigjiga University

Abdulkarim Mohammed	Dryland Agriculture Food Science and Nutrition Department
Bisrat Kassahun	Sociology and Humanities Department
Dr. Mohammed Ibrahim	Veterinary Medicine Department
Eliyas Abdulahi	Geography and Environmental Studies Department
Habtamu Atlaw	Geography and Environmental Studies Department
Muktar Osman	Law Department
Samson Hailemariam	Animal and Range Science Department
Sied Muhumed Jibril	Management Department
Dr. Tsegalem Abera	Veterinary Medicine Department

Samara University

Buzuayew Hailu	Anthropology Department
Dr. Fikre Zeru	Veterinary Medicine Department
Dr. Gezahegn Alemayehu	Veterinary Medicine Department
Kemal Ahmed	Sociology Department
Mebrat Teklemariam	Animal Science Department
Natnael Demelash	Animal Science Department

Bule Hora University

Adugna Babu	Natural Resource Management Department
Angasa Tesfaye	Animal and Range Science Department
Bayissa Negesa	Social Anthropology Department
Negessa Mokona	Social Anthropology Department
Yohannes Urgesa	Animal and Range Science Department

The university lecturers were supported in producing the text book and the accompanying common course on pastoralism by Ced Hesse, Berhanu Admassu, Dawit Abebe, Getachew Gebru, Kassahun Asmare and Eshetu Yimer.

The three universities also wish to acknowledge the financial assistance received from CORDAID and USAID.

Introduction to the common course

This text book accompanies the common course on **Pastoralism Today** currently taught at the Universities of Bule Hora, Jigjiga and Samara as part of their undergraduate and graduate programmes. The common course introduces students to the fascinating and rich world of pastoralism in Ethiopia and beyond. It provides them with the knowledge and skills to analyse and understand pastoral systems as they exist today, and the options for their future development in support of national economic growth in a changing world. The common course and its accompanying text book are designed to enable students from different personal and professional backgrounds to understand how pastoralism functions as a system, its contributions to local, national and global economies and sustainable environmental management, and its role in promoting peace and harmony between pastoral and other communities.

The common course asks: what is pastoralism? Where and why did it originate and where do you find pastoralists today? You will examine the three basic pillars of pastoralism and the interdependence of each pillar within the system as a whole:

- Natural resources
- The livestock herd
- Pastoral society and institutions.

Pastoralism is found in some of the most challenging, as well as rich and fertile, environments on earth, from the Nile and the Rift Valleys to the Steppes of Mongolia and the edges of the Sahara Desert, as well as in mountainous and lowland regions in Europe. The common course will look at the opportunities and the constraints to livelihoods in pastoral areas. It will examine the sustainability of natural and livestock resources management in theory and in practice, the strategies employed by pastoral communities to manage, and in some circumstances benefit from, variable and unpredictable conditions; and how effectively pastoral institutions contribute to the proper and rational utilisation of rangeland resources.

It will investigate the socio-economic contribution of pastoralism at the local, national and international levels. The course facilitates discussion on the role and contribution of pastoralism to national and regional development objectives, and debates its place in a modern and changing world. Pastoralism does not exist in a vacuum – it interacts with other production systems and is impacted on by government policies. The final part of the course addresses previous and current policy interventions in pastoral areas.

The text book and accompanying common course on Pastoralism Today will be of interest to students pursuing very different degree courses and career pathways, be it as researchers in range ecology, animal science, sociology or economics. It will also be of interest for students who wish to become managers and technicians in rural development, government officers in the field of livestock or health services, or even private sector employees in engineering or information technology. Having a good understanding of the rationale of pastoral systems and how they work will enable all students, but particularly those that will work in pastoral areas, to ensure their work maintains the well-being of pastoral communities and that of the environment on which they depend.

At the end of this course you will have the following competencies:

- You will be able to contribute to the management and conservation of natural resources for sustainable use in pastoral areas.
- You will be able to apply pastoralism knowledge to increase pastoral production for sustainable development.
- You will be able to advise possible policies and strategies to improve productivity in pastoral areas.
- You will recognise the importance of conserving pastoralists' environmental biodiversity.
- You will be able to appreciate different livelihood strategies that are employed by different pastoral community groups in different environmental settings.
- You will be able to develop and organise seminars on contemporary pastoralism-related issues.

This text book provides a background and supporting documentation to the common course **Pastoralism Today**. It gives brief summaries of the issues covered during lectures and seminars, provides supporting materials (for example images, data, definitions and other information), and lists references for additional reading assignments.

Just like the pastoral system itself, this text book is living and adapting to changes and new ideas – you may send your suggestions to: berhanu.admassu@tufts.edu

1. Introduction to pastoralism

Summary

This chapter introduces pastoralism as a production system and as a livelihood in Ethiopia and worldwide. It then discusses some of the changes that pastoralists are currently experiencing:

- Pastoralism is a diverse livelihood, but one that is centred on the raising of livestock, and usually involves some form of mobility. Pastoralism takes advantage of the characteristic variability and instability of rangeland environments.

- Pastoralism, and the domestication of livestock, originated between 11,000 and 7,500 years BP (before present) in the Horn of Africa and North Sahara. Around 5,000 years BP, livestock spread south into East Africa, and herding was mixed with other activities, such as farming and hunting. More specialised pastoralism emerged later, between 3,000 and 2,000 years BP.

- Pastoralism is found worldwide and pastoralists are diverse groups of people who depend on livestock for their economical, social and cultural livelihoods. However, pastoralists often combine the rearing of livestock with other activities, such as agriculture and trade.

- In Ethiopia, there are a number of different pastoralist groups that share key common characteristics, but which are also very diverse. Pastoralists are externally differentiated; they vary in the extent of livestock they keep and the different activities in which they are involved. Pastoralists are also internally differentiated; they vary along gender, age and wealth lines.

- Pastoralism in Ethiopia is dynamic and fluid, and pastoralists respond to changes that are taking place in their social, economic, political and physical environments. There are a number of forces currently affecting pastoralism that are causing changes - some are able to benefit and others lose out. These changes include greater government recognition of pastoralism, increasing wealth concentration, increasing education, new technology, tourism, conversion of rangeland to other uses, income diversification, and more violent conflict.

Brainstorming/strategic questions

1) Why is it difficult to provide one definition of pastoralism or pastoralist people?
2) What are the reasons for the high diversity of pastoral groups found in Ethiopia and beyond?
3) Why are pastoral livelihoods particularly vulnerable to global forces, such as climate change, human population growth, and land use change?

1.1. Defining pastoralism

There are several definitions of pastoralism. Box 1.1 presents some of the common definitions that have been used in the past.

Box 1.1 Some definitions of pastoralism/agro-pastoralism

Pastoral production systems are those "in which at least 50 per cent of the gross incomes from households (i.e. the value of market production and the estimated value of subsistence production consumed by households) comes from pastoralism or its related activities, or else, where more than 15 per cent of household's food energy consumption involves the milk or dairy products they produce" (Swift 1988). In comparison, agropastoralists are those who derive more than 25 per cent but less than 50 per cent of their incomes from livestock, and most of the remaining income from cultivation.

African pastoralism is defined by a high reliance on livestock as a source of economic and social wellbeing, and various types of strategic mobility to access water and grazing resources in areas of high rainfall variability (African Union Policy Framework for Pastoralism in Africa 2010).

Pastoralism refers to any predominantly livestock-based production system that is mainly extensive in nature and uses some form of mobility of livestock (Hatfield and Davies 2006).

One of the more recent definitions of pastoralism is given in the policy for the development of Arid and Semi Arid Lands (ASALs), adopted by the government of Kenya in January 2012. This definition is particularly interesting because it characterises pastoralism as a production and social system that takes advantage of the unstable and unpredictable environmental conditions that are characteristics of the drylands:

> *The term refers to both an economic activity and a cultural identity, but the latter does not necessarily imply the former. As an economic activity, pastoralism is an animal production system which takes advantage of the characteristic instability of rangeland environments, where key resources such as nutrients and water for livestock become available in short-lived and largely unpredictable concentrations. Crucial aspects of pastoralist specialisation are: (1) The interaction of people, animals and the environment, particularly strategic mobility of livestock and selective feeding; and (2) The development of flexible resource management systems, particularly communal land management institutions and non-exclusive entitlements to water resources (Republic of Kenya 2012).*

Pastoralism is a production system closely linked with cultural identity, that relies on raising livestock on pastures that may be commonly or privately managed and accessed through agreements based on negotiation, reciprocity and competition. Livestock are social, cultural and spiritual assets, as well as economic assets, providing food and income for the family within and between generations. Livestock management strategies in a pastoralism system include herd mobility and diversification, with a high proportion of female livestock. Typically, pastoralism (as opposed to other livestock production systems) derives economic benefits from lands not suited to crop cultivation, and is dependent upon periodic access to more productive pastures during regular dry seasons or drought. In agropastoral systems, in addition to livestock production, there is some form of crop cultivation. Pastoralism is distinct, or different from, other types of livestock production, such as ranching and dairying, which require greater levels of input, higher labour and management requirements, and have larger production targets for commercial markets (See Box 1.2).

Box 1.2 Key characteristics of ranching and dairying

Key characteristics of ranching systems (e.g. Kenya):

- Livestock are grazed within defined and **fixed boundaries** (usually fenced).
- Natural resources are managed through **private regimes.**
- Ranching is **commercially** oriented (mainly beef) for home and export markets.
- Livestock represent purely an **economic asset.**
- Livestock depend on natural pastures as well as purchased feeds.
- Ranching mainly depends primarily on **hired labour**: both technical and manual.
- A key livestock management strategy involves **herd splitting** through separation using fences and controlled stocking rates.

In many of the areas where ranching is practiced, the rainfall regime allows for
dependable crop cultivation and predictable pasture production.

Key characteristics of dairy systems (e.g. Ethiopia):

- Dairying involves **high levels of input**, e.g. feed/concentrates.
- Dairy systems produce **higher milk yields** than less intensive systems.
- The **focus is on milk** production.
- Dairy stock represent an **economic asset.**
- High yielding breeds and/or cross-breeds are used.
- Management and labour requirements are high.
- Dairying requires a **sophisticated marketing chain** to enable the products to be sold.
- Many dairy units are **indoors**, supplemented at times by fenced grazing land.

1.2. Who are pastoralists?

Pastoralists are people who depend largely on livestock for their food and income; livestock are used for both subsistence and marketing, and pastoralists also look to livestock to define their cultural identity.

Pastoralists are men and women, young and old. All members of the family are involved in livestock production and marketing, as well as other livelihood activities, and maintaining the health and safety of the family.

Pastoralists in Ethiopia and East Africa live in very different environments: wet, cold highlands; dry, hot lowlands; swampy wetlands or along riverine forests; and get their water from different sources. By our definition, however, all these environments share a common characteristic: **unpredictable and highly variable access to pasture and water within and between years.**

Pastoralists raise different species and breeds of livestock: cattle, camels, goats, sheep, and donkeys. They are responsible for feeding and watering their animals, providing veterinary care, and marketing both livestock and their products.

Pastoralists combine livestock production with other activities such as agriculture, trade, firewood, non-timber forest products and tourism.

Many pastoralists live in marginal areas, geographically close to national borders.

Pastoralism is dynamic and pastoralists are constantly changing - responding to change in the social, economic, political and physical environment.

1.3. History and origins of pastoralism

A picture of the history and origins of pastoralism continues to evolve, based on a range of different sources of information and evidence, from linguistics to archeological finds, to most recently genetics. Rock art, Egyptian wall paintings and Zimbabwean figurines have all provided the clues to the chronology, husbandry practices, and the cultural importance of pastoralism. Traces of technology associated with animal husbandry, including leather, pottery for milking, and enclosures, combined with careful analysis of the remains of animals in association with those of human settlements, have been used to build up a picture of the gradual divergence between wild and domesticated animal species and the existence of pastoralism over time and space.

There is evidence of indigenous domestication of livestock between 11,000 and 7,500 years BP (before present) in the Horn of Africa and the North Sahara. The Saharo-Sahelians of the Middle Nile are thought to have had domesticated cattle first, around 9,500BP, predating the first domestic cattle in South-west Asia by a thousand years or more. Sheep and goats were first domesticated around 11,000BP, in present day Syria and Palestine, from where they spread southwards into North-East Africa (Homewood 2008).

Pastoral culture spread from the Nile Valley and North Africa, probably through the agency of the ancestors of present-day Berber populations. "Across North Africa, the descendants of the Capsians (ancestors of the Berbers) practiced a Mediterranean form of agropastoralism by 7,000-6,000BP, based on cattle, sheep and goats, alongside cultivation of the Middle Eastern wheat and barley domesticates" (Homewood 2008, p.16). From 7,000BP on, pastoralism based on domesticated cattle, sheep and goats spread south leaving vivid portrayals in rock art through the central and southern Sahara. As the climate of the Sahara dried, gradually becoming uninhabitable, populations moved southwards and eastwards again. The Sahara is believed to have become uninhabitable for cattle between 5,000 and 4,000BP. It is around this time that it is thought that livestock spread into East Africa from the north, where herding was mixed with other activities such as cropping hunting and fishing (Homewood 2008).

Groups practicing specialised pastoralism appeared later, with evidence of specialised pastoralists emerging between 3,000BP and 2,000BP (Marshall 1990).

Camels were the last animals to be domesticated into African pastoralism and were introduced to the Horn of Africa between 4,500 and 3,500BP (Homewood 2008). Camels continue to spread to other arid areas of the continent.

A comprehensive description of the origins and spread of African pastoralism, and a more recent history of the major African pastoralist groups can be found in Homewood (2008, pp.10-49).

Source: Homewood 2008.

1.4. Pastoralism worldwide and in East Africa.

The International Fund for Agricultural Development (IFAD) estimates the total number of pastoralists at nearly 200 million worldwide (Rota and Sperandini 2009). From the Steppes of Central Asia to the highlands of South America, the types of livestock herded by pastoralists depend on the climate, environment, and geographical area, and include camels, goats, cattle, sheep, yaks, horses, llamas, alpacas, reindeer and vicunas.

However, data describing the number and importance of pastoralism worldwide are highly incomplete. Indian pastoralism in the Rajasthan Desert has been extensively researched, but insecurity in Pakistan and Afghanistan has limited the degree to which pastoral systems have been documented and understood. Similarly, there are regions of Turkey and North-West India that are also poorly documented in literature. In Central Asia, particularly in Mongolia and the Commonwealth of Independent States, there is a growing interest in supporting pastoralism, but the extent and practices of Mongol and Kazakh herders in North-West China are still vague, as Chinese-dominated regions of Central Asia have been off-limits for research for decades. Andean pastoralism, once considered a borrowing from European traditions, is now known to be an ancient tradition, but studies describing these systems are again patchy.

East African pastoralism is better researched, with a number ofscholars focusing on some of the main pastoral groups, including the Maasai (Spear and Waller 1993), the Turkana (Lamphear 1993), the Ariaal (Fratkin 1991), the Borana and Rendille (Fratkin 2001), amongst more general regional or Africa-wide texts (e.g. Anderson and Broch-Due 2000; Fratkin et al. 1994; Galaty and Bonte 1991; Hodgson 2000; Homewood 2008).

There are estimated to be 30 million pastoralists and agro-pastoralists in the Greater Horn of Africa (Somalia, Ethiopia, Kenya, South Sudan, Eritrea, Djibouti, Sudan, Tanzania and Uganda) (FAC CAADP 2012). In these countries, pastoralists have been shifting between a range of livestock and non-livestock based activites for millenia, but with livestock remaining central to their social, economic and cultural livelihoods. Pastoralism in these areas is diverse and dynamic, as pastoralists are continually responding and adapting to the opportunities and challenges that face them.

1.5. Pastoralism in Ethiopia

Pastoral areas constitute around 60 per cent of Ethiopia's total land mass, and around 15 per cent of Ethiopia's population (12-15 million people) are pastoralists. Pastoralists in Ethiopia share many common features, including their reliance on livestock and livestock products, a cultural identity associated with livestock, and expertise in livestock rearing in arid rangelands (Box 1.3). They also share common problems of land alienation, poverty, environmental degradation and conflict. For these reasons, they are often 'lumped together'as a homogenous group.

Box 1.3 Key characteristics common to pastoral systems in Ethiopia

- Families depend on livestock for a significant proportion of their food and income.
- Livestock are raised for a mix of subsistence (particularly milk) and market needs (e.g. livestock sales to buy food, to pay taxes, etc.).
- Livestock herds are composed mainly of indigenous breeds.
- Livestock represent more than just economic assets. They are social, cultural and spiritual assets too. They define and provide social identity and security.
- Livestock are largely dependent on rain-fed pastures for their diets, including crop residues in some systems.
- Pastoralism depends on the work and expertise of all family members, usually divided by gender and age.
- Many pastoralists cultivate crops and carry out other economic activities to meet their subsistence needs.
- Key livestock management strategies include: herd mobility, raising several species of animals (diversification), active management of age structure and sex ratio, herd splitting, and maintenance of a high proportion of female livestock.
- Pastoral resources are managed through a mix of common property and private regimes where access to pastures and water are negotiated and dependent on reciprocal arrangements.
- Pastoralism is characterised by adaptation and evolution to constraints of climate, economic, political change and opportunities facing them.
- Pastoralism is characterised by its ability to realise economic benefits from environments characteristed by high uncertainty and variability.

In fact, pastoral systems in Ethiopia are highly diverse, complex and dynamic. Within Ethiopia, it is possible to name more than 20 different ethnic groups that are pastoralists.

Some pastoral groups in Ethiopia

Afar, Somali, Borana, Hamer, Dassenech, Nyangatom, Mursi, Guji, Bodi, Gere, Kereyu, Oromo-Bale, Oromo-Harar, Nuer, Gebra, Agnuwak, Tsemay, Bena, Arbore, Surma, Murle, Male, Birale, etc.

The many faces of pastoralism in Ethiopia are characterised by diversity in the environments in which they live, the species and breeds of livestock they raise, their cultural practices, their specific livelihood strategies, and the way in which they are responding to outside pressures. Pastoralists within a community are differentiated by gender, age and wealth. Importantly, pastoralism is not just about the management of livestock. It also involves livestock products (milk, hides, and in some cases, dung), and integrating other activities such as agriculture, non-timber forest products, and trade. Levels of engagement in, and the types of non-pastoral activities that support pastoral livelihoods will vary within and between groups based on geographic location, age and gender, and access to markets, amongst others.

Because of this, not all pastoralists are affected in the same way by problems of drought, land alienation, conflict, etc.

1.5.1. The changing faces of pastoralism in Ethiopia

Pastoralism in Ethiopia is not static, or unchanging. Pastoralism is dynamic and is constantly responding to change in the social, economic, political and physical environment. Pastoral cultures are also `modernising' and adapting to the forces of change around them. Some of these forces include:

- Education
- Global trade and monetisation of the economy
- Technology, such as mobile phones
- Increasing urbanisation
- Increasing involvement by NGOs and the private sector.

Figure 1.1: Examples of forces of change impacting on pastoralism

Changes are taking place for the better, as well as to the detriment of pastoralism and pastoralists. Some of these changes are described below. Not all pastoralists are equally affected by these changes – some will benefit, while others are losing out as result of their age, gender or other social distinctions.

- **Greater government recognition of pastoralism,** as demonstrated by the annual National Pastoralists' Day in Ethiopia. Although misunderstanding persists about the nature and rationale of the pastoral production system, pastoralists are becoming MPs and ministers, and/or powerful in business. At the same time, there is an emergence of a pastoral civil society movement.

- **Wealth and livestock ownership is increasingly concentrated** among fewer people, while the number of livestock stays static over the long term. This results

in fewer wealthy people and many more poor.

- **Education** is increasingly available for pastoralists, including women, though there is still much more to do with respect to access and the content of the curriculum.

- Pastoralists (men and women) are increasingly involved in the cash economy.

- **Mobile phones** are bringing new opportunities for trade, for accessing information, and managing livestock movements and pastures.

- **Tourism** is increasing in pastoral areas, with both positive and negative effects. For example, in some cases tourism has provided useful additional revenue for local populations, while in others, regulations around wildlife management have restrained natural resource use and mobility, with the effect of reducing local incomes.

- **Pastoral resources in the rangelands,** particularly the more highly productive areas essential for dry season survival, continue to be converted to other uses:
  - o to agriculture (tractor photo)
  - o to private ranches and game ranches
  - o to national parks and other protected areas
  - o to bush encroachment as a result of insecurity or exclusion
  - o to irrigation (often leading to the loss of critical dry season reserves and access to water).
- Income sources continue to diversify as populations rise and poverty increases. For example, poor pastoralists are turning to charcoal production to make a living, which is degrading the environment in some places. Although charcoal production increasingly controlled by wealthy businessmen and traders in some places.

- The nature of conflict in pastoral areas is changing – traditional weapons are being replaced with modern machine guns; raiding is becoming more violent and sometimes driven by external forces.

- Famine and violence are increasingly affecting pastoral communities, pushing them into refugee camps where they are dependent on external food aid.

In the subsequent chapters, this text book will take a closer look at these social, economic, political and physical changes that are occurring in the environments in which pastoralists live and make their livelihood. These changes are bringing both constraints and opportunities to pastoralism, and to the sustainability of pastoral systems.

The next chapter introduces the 'three pillars of pastoralism' - the natural resources, the herd, and the family and wider social institutions - and shows how these three key components of the pastoral system are interdependent and interrelated to one another.

Figure 1.2: Natural pastures, particularly the more highly productive areas essential for dry season survival, continue to be converted to other uses.

References and further reading

Anderson, D., and Broch-Due, V. 1999. The Poor are Not Us. Oxford: James Currey.

AU 2010. Policy framework for pastoralism in Africa: securing, protecting and improving the lives, livelihoods and rights of pastoralist communities. Department of Rural Economy and Agriculture, African Union Commission. Addis Ababa, Ethiopia. http://rea.au.int/en/sites/default/files/Pastoral%20Policy%20Framework%20-%20Low%20res.pdf

Blench, R. 1999. Why are there so many pastoral groups in East Africa? In: V Azarya, A Breedveld, M De Bruijn, H Van Dijk (Eds.), Pastoralists under pressure. Fulbe Societies Confronting Change in West Africa, pp.29-50. Brill, Leiden.

FAC CAADP 2012. Pastoralism in the Horn of Africa: Diverse livelihood pathways. Future Agricultures. FAC CAADP Policy Brief 06. March 2012. www.future-agricultures.org/policy-engagement/policy briefs/1531-pastoralism-in-the-horn-of-africa-diverse-livelihood-pathways/file

Fratkin, E. 2001. East African Pastoralism in Transition: Maasai, Boran and Rendille Cases. African Studies Review, 44(93), 1-25.

Fratkin, E. 1991. Surviving Drought and Development: Ariaal Pastoralists of Northern Kenya. Boulder, CO: Westview Press.

Fratkin, E., Galvin, K., and Roth, E.A. 1994. African Pastoral Systems: an Integrated Approach. Boulder, CO: Lynne Rienner.

Galaty, J.G., and Bonte, P. 1991. Herders, warriors and traders: pastoralism in Africa. Boulder, CO: Westview Press.

Hatfield, R., and Davies, J. 2006. Global review of the economics of pastoralism. World Initiative for Sustainable Pastoralism/IUCN, Nairobi, Kenya. https://cmsdata.iucn.org/downloads/global_review_ofthe_economicsof_pastoralism_en.pdf

Hodgson, D. 2000. Rethinking Pastoralism in Africa: gender, culture and the myth of the patriarchal pastoralist. Oxford: James Currey.

Homewood, K. 2008. Ecology of African pastoralist societies. Oxford: James Currey.

Lamphear, J. 1993. 'Aspects of becoming Turkana', in T. Spear and R. Waller (eds), Being Maasai: ethnicity and identity in East Africa. London: James Currey.

Marshall, F. 1990. Origins of specialized pastoral production in East Africa. American Anthropologist, 92, 873-94.

Republic of Kenya 2012. Sessional Paper No. 8 of 2012 on National Policy for the Sustainable Development of Northern Kenya and other Arid Lands - Ministry of State for Development of Northern Kenya and Other Arid Lands http://adaconsortium.org/images/publications/Sessional-Paper-on-National-policy-for development-of-ASALs.pdf

Rota, A., and Sperandini, S. 2009. Livestock and pastoralists. IFAD Thematic Paper www.ifad.org/lrkm/factsheet/pastoralists.pdf

Smith, A.B. 1992. Pastoralism in Africa: Origins and development ecology. Athens: Ohio University Press.

Spear, T., and Waller, R. 1993. Being Maasai: ethnicity and identity in East Africa. London: James Currey.

Swift, J. 1988. Major Issues in Pastoral Development with Special Emphasis on Selected African Countries. Food and Agriculture Organization of the United Nations, Rome, Institute of Development Studies, University of Sussex, UK.

2. Pastoralism as a system – the three pillars

Summary

This chapter introduces the three pillars of pastoralism, and discusses how each pillar or component interacts with each other to make up the pastoral system:

- Pastoralism can be thought of as a system - where pastoralists use a number of strategies, based on livestock, to take advantage of the variable resources and maintain their natural environment.

- The three main components of the system – or the three pillars of pastoralism – are the natural resources, the herd, and the family and other social insitutions. These three components make up the pastoral system itself and are common to all pastoral systems in Ethiopia and beyond:

    1) Natural resources comprise the food and water that livestock and people depend on.

    2) The herd is made up of a composition of different animals. They are economic assets, but social, cultural and spiritual assets too.

    3) The family and other social institutions are the wider network of institutions in which the pastoral family and the herd live. Each member of the family will have different roles to play, and the family itself is set within a wider network of rules, obligations and operations.

- The three pillars of pastoralism are interdependent. They interrelate and impact on each other, thereby allowing the pastoral system to function.

Brainstorming questions

1) In what ways do the key components of the pastoral system depend on one another?

2) Why is the view of the three pillars of pastoralism an important concept to use when developing policies, practices and interventions in pastoral systems?

Pastoralism is a system by which familes, living in areas characterised by high levels of variability and unpredictability in rainfall, raise livestock as a primary source of livelihood and cultural identity.

What is a system?
A system is a unified whole of regularly interacting and interdependent components or units.

Within the system, rules and strategies help to manage the risks that are a defining charateristic of pastoralism: environmental risks associated with the variable and unpredicitble environment where pastoralism takes place; and also risks associated with markets, disease, policy change and insecurity.

Livestock provide the key cultural, social, and economic identity of pastoralism, but increasingly pastoralists are engaged in other forms of livelihood activities. Pastoralists are also farmers, lawyers and soldiers, security watchmen, artists and artisans. Thus, as well as through their livestock herd, pastoral families derive livelihoods from a range of economic activities. These will vary in importance and frequency from one group to another, from one family to another, and one individual to another, as a function of their gender, age, wealth, location, as well as broader political, social and environmental conditions. This dynamism is a key feature of dryland livelihood systems.

Box 2.1 Key points on pastoralism

Pastoralism is a system composed of three principal components or `pillars':
- The family and wider social institutions (labour, governance)
- The herd (livestock)
- Pastoral resources (pasture, water, minerals) that are found in the environment.

These all exist within a broader social, cultural, and economic context. The system will be impacted on, positively or negatively, by policies that affect any of these three pillars.

2.1. The pillars of pastoralism

Pastoralism is a production system with three distinct components that are independent and interact with each other:

- the family and other wider social institutions
- the natural resources
- the herd.

These three components can be thought of as the three pillars of pastoralism - the principal components that make up the pastoral system itself (Figure 2.1).

These pillars are common to all pastoral systems in Ethiopia and represent

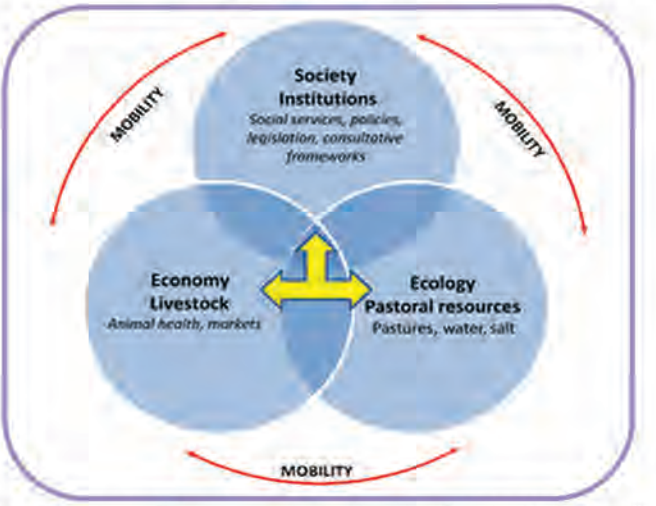


Figure 2.1 The three pillars of pastoralism. The box containing the three pilllars represents the social, political and economic context in which pastoralism exists today.

Other resources, such as veterinary drugs, or supplementary animal feeds, such as molasses or cottonseed cake, may support or impact one or more of the pillars. In the above model, these other resources exist within the broader context of market forces, service provision, and policies that impact on the three pillars. Many pastoralists do not have easy access to veterinary drugs, education, and markets, but even without these they can still raise livestock and support their livelihoods. Similarly, the importance of `land' lies in the resources that it provides – water, forage and grazing, timber, etc. for people, for animal production, as well as other livelihood systems. Good policies are essential to provide an `enabling' environment to let pastoralism flourish. In other words, policy issues and markets are the contexts in which the system operates.

2.1.1 Natural resources

Livestock need to eat and then they need to drink before needing to eat again. Water, trees, scrubs, grasses and salt pans constitute the resources found within the rangelands on which livestock and the pastoral family depend.

Pastoralism exists in parts of the world where rainfall is highly variable and unpredictable in time and space. In pastoral systems, livestock depend almost exclusively on these pastures and use mobility to access food and water between seasons and years. The quantity and quality of natural resources on which pastoralism depend are strongly influenced by rainfall patterns (discussed in Chapter 3).

2.1.2 Livestock herd

Livestock in pastoral systems include cattle, camels, sheep, goats and donkeys.The exact composition of a family's herd will vary according to the family's needs, the season, and the environment in which they live. Livestock in pastoral systems represent more than just economic assets. They are social, cultural and spiritual assets too. They define and provide social identity and security.

2.1.3 The family / social institutions

Pastoralism depends on the work and expertise of all family members, usually divided by gender and age. Support within the family and between families is vital to ensure pastoralists can maximise on their needs and spread any risks. It is impossible to consider the pastoral family without considering the wider social and economic institutions within which they live.

The family provides the labour, technical knowledge, marketing expertise and social networks that allow the system to function. Different members of the family contribute in different ways. For example, women are experts in marketing cattle milk and smallstock, as well as being experts in animal health care, monitoring the growth and health of calves and their mothers, deciding how much cattle milk to take for the family, and informing decisions when the family needs to move, based on the quality and quantity of milk being produced. Negotiations among clan leaders (older men) are implemented and influenced by the social and economic networks established by younger men who are herding and taking livestock to markets.

Figure 2.2 Women are experts in marketing milk and smallstock, as well as being experts in animal health, monitoring the growth and health of calves and their mothers, deciding how much milk to take for the family, and informing decisions when the family needs to move, based on the quality and quantity of milk being produced.

2.2. The dynamics and interaction of the pillars of pastoralism

The three pillars of pastoralism do not exist in isolation of each other; they interact so that the sum is more than the whole.

Livestock bring cultural and social identity and security to the family, as well as economic security and health. Natural resources are impacted in both positive and negative ways by the livestock that depend on them, and this is influenced by the decisions made by members of the family about, for example, how many livestock to keep, when to move, and which livestock to keep where. Box 2.2 outlines these interactions in more detail.

In the following three chapters, each of the three pillars is considered in turn, helping to build an understanding of the role each plays, and demonstrating the internal logic and rationale of pastoralism as a system that, if allowed to function according to its logic, can take advantage of the resource variability characteristic of the dry rangelands of Ethiopia.

Box 2.2 Interactions between the three pillars and the broader policy context

- The herd has an impact on natural resources – e.g. by eating pastures, animals have a direct impact on plants.
- Natural resources have an impact on the herd – e.g. plants provide food for animals.
- The family has an impact on the herd – e.g. they take the animals to pasture, provide them with water, occasionally slaughter them, etc.
- The herd has an impact on the family – e.g. it provides milk, meat and blood.
- Natural resources have an impact on the family – e.g. providing fuel wood, water, food and medicines.
- The family has an impact on natural resources – e.g. they cut wood for shelter, dig wells for water, burn pastures, etc.
- Wider social and economic institutions have an impact on natural resources and the family – e.g. traditional institutions can manage access to some natural resources; they also manage conflict.

Further reading

FAO 2001. Pastoralism in the new millennium. FAO Animal Production and Health Paper No. 150.www.fao.org/docrep/005/y2647e/y2647e00.htm

Fratkin E.M., and Mearns, R. 2003. Sustainability and Pastoral Livelihoods: Lessons from East Africa and Mongolia. Human Organization, 62(2), 112-122. www.smith.edu/anthro/documents/FratkinandMearnsSustainabliltyandPastoralLivelihoods.pdf

3. Pillar One - the environment and natural resources in pastoral areas



Summary

This chapter considers Pillar One of the pastoral system and explores the dynamics of natural resources. It looks at the factors that influence the availiability and quality of resources and the interaction between these resources and livestock.

- In Ethiopia, there are a number of different types of environment including highland areas, lowland areas, wetlands and riverine forests, and these different types of environment determine the quality and quantity of natural pasture available to livestock, and how this varies between wet and dry seasons.

- In the wet season, grasses have high nutritional value for livestock diets, but in the dry season, grasses are of low nurtritional value and trees and shrubs become much more important, and can maintain livestock productivity.

- Rainfall in a given rainy season is highly variable and unpredictable. There is positive correlation between the quantity of rainfall and the quantity of pasture that grows, however this is not necessarily true of the quality of pasture, which can be greater under lower rainfall levels depending on the soils. The variability in timing and location of rainfall also has an effect on plant growth and thus its nutritional value for livestock, and this is also dependent on the species of the plant and soil type.

- Rangeland pastures are therefore made up of a patchwork of pasture areas at different stages of growth and with different levels of plant growth and nutritional quality. Pastoralists employ a number of strategies to exploit this variability in pasture, including livestock mobility, selective breeding of livestock and species diversity. Dryland plants species also have a number of mechanisms by which they maximise their survival through grazing and during drought periods.

- From one year to the next, rainfall is very erratic in pastoral systems in Ethiopia and elsewhere, with a large variation in annual and seasonal rainfall and periodic drought. Increasing climate variability and changes in the intensity of frequency of droughts and floods is likely to have a large impact in pastoral systems, to which pastoralist will be required to adapt.

- The standing biomass is the amount of grass that remains after the end of the rainy season. In pastoral systems, this is the major source of food for livestock that has to last them through the dry season to the next rainy season. Pastoralists have strategies to allow them to manage the standing biomass wisely to enable their herds to access fodder throughout the dry season.

- Livestock can have both a positive and negative effect on pasture: intensive livestock grazing can damage pastures if not given sufffficient time to recover; however, livestock grazing can also stimulate plant growth and aid regeneration.

Brainstorming questions

1) Why are pastoralists and livestock best placed to make use of these natural dryland pastures?

2) Why are livestock-plant interactions important for the maintenance of these dryland areas, and what would happen if livestock grazing were removed?

3) What are some of the possible effects that a change in climate (rainfall, temperature) will have on dryland pastures and thus livestock strategies?

Livestock eat a variety of different resources (Box 3.2). Natural pastures, such as trees, grasses and shrubs, are the major source of feed for the majority of pastoral livestock in Ethiopia. Other resources, such as cottonseed, hay, crop residues or irrigated pastures, will improve the livestock diet if pastoralists can access them, but for many pastoralists this is difficult or impossible.

Box 3.1 Key points – natural pastures

Natural pastures are the most important source of feed for most livestock in Ethiopia. Natural pastures are found in different environments with different characteristics that will affect the nutritional quality and quantity of pastures and how they grow.

The natural resources that are essential for pastoral production in Ethiopia are:

- Grasses.
- **Certain herbs and trees products** (pods, leaves, bark). These are also important as food and medicine for people.
- **Water** for people and livestock.
- **Natural salt pans** and **crop residues** (in certain areas) for livestock diets.
- **Wood** for fuel, fencing, building, etc.

Pastoralists access different pastoral environments in different seasons. In order to understand why, we must first understand the basic dynamics of pastures.

A note on `availability'

AVAILABILITY of pasture and water to pastoralists and their livestock is based on the QUANTITY AND DISTRIBUTION of those resources in the rangelands, as well as the conditions of ACCESS to those resources. In other words, there may be water in the well, but availability depends on whether or not you have rights to that water, as well as the necessary technology or ability (e.g. labour) to draw the water from the well.

In this chapter we focus on availability of natural resources IN TERMS OF THEIR QUANTITY AND QUALITY OVER TIME AND SPACE. Access to resources is defined by social and cultural institutions, as well as policy, which are discussed further in Chapters Five and Six.

Box 3.2 What do livestock eat?

- Grasses
- Shrubs and browse plants
- Tree pods, leaves, bark and flowers
- Salt from salt licks or even water in some cases
- Crop residues such as maize, sorghum, cotton or sugar cane
- Hay
- Industrial by-products such as molasses, cottonseed cake

3.1. Types of natural pasture

Natural pastures are found in many different environments in Ethiopia - from the dry, hot lowlands to the wetter, cooler highlands. The natural environment (rainfall, temperature, soil type and aspect, humidity, etc.) determines the species of the plants and the quality and quantity of pastures, and their distribution in time and place - See Figure 3.1.

- Highland areas are cooler and receive more rain that is less variable. Pastures will be more abundant and stay greener for a longer period than the lowlands. However, there will be more disease (e.g. ticks).

- Lowlands have higher temperatures and less, and more variable, rain for a shorter time. Permanent water will be more scarce. Pastures will be mainly composed of grasslands, shrubs and acacia-type trees. There will be minerals, such as salt pans, and the risk of disease may be less.

- Wetlands or swampy areas in drylands will have high temperatures. Some areas will have permanent dry season water and some vegetation will remain green through the dry season. There may be more disease.

- Riverine forests in the lowlands will have high temperatures. Permanent water will support forests, shrubs and possibly some grassland, and there may be more disease.

Figure 3.1 Natural pastures are found in many different environments: lowland and highland areas; open grassland, shrubland and dryland forest; riverine valleys and areas with little or no permanent water. The different environments will have different impacts on the availability and type of pasture.

Highlands and lowlands, wetlands and riverine forests, are all important sources of natural pasture for pastoralists, representing wet and dry season pastures, or places of refuge during drought years. In some pastoral systems, wetlands or swamps or riverine forests are very important, providing green grass or tree products and water during the dry season (Scoones 1992). In other pastoral systems, highland areas can be important sources of water and pasture during the dry season.

Rangelands that have areas of permanent water in the dry season attract production systems other than pastoralism, such as irrigated sugar cane production or biofuels, produced along the banks of a permanent river. The cultivation of these crops often undermines the ability of pastoralists to access water and find fodder for their livestock during the dry season (Behnke and Kerven 2013). This destabilises the functionality of the pastoral system.

3.2. Factors determining the quantity and quality of natural pasture

The quantity and quality of grasses, shrubs, and trees available to livestock have important implications on the health and productivity of livestock and pastoral livelihoods. Identifying and understanding the factors that influence the availability and quality of natural pasture allows us to understand the rationale underpinning pastoralists' management decisions and strategies.

Different fodder plants grow and reproduce at different rates and in different conditions. Seasons, rainfall, altitude, fire, wildlife, livestock, and soils, all affect the quality and quantity of different grasses and trees.

3.2.1 Variation in rainfall (moisture availability) between the wet and the dry season

The variations in moisture for plant growth between the wet season and the dry season have an important influence on the quantity and quality of pastures between these seasons. This is normal in arid and semi-arid areas of Ethiopia.

Grasses in wet season pastures are `alive' and going through their life-cycle. They contain more water and are richer in protein, digestibility and minerals. In contrast, during the dry season, many grasses have either completed their life cycle (e.g. annuals) or are dormant (e.g. perennials). They have very little water content, lower protein content and lower digestibility, (See Figure 3.2 below.)

Seasonal changes in the nutritional quality of grasses

Grass species	Water		Protein		Digestibility	
	Wet season	Dry season	Wet season	Dry season	Wet season	Dry season
Themeda triandra	95	5	14	4	76	37
Panicum maximum	94	6	20	5	85	45
Eragrostis superba	95	5	13	5	78	47

Figure 3.2 The rainfall received during the wet season impacts the quantity and quality of pastures. Pastures in the wet season contain more water and are richer in protein, digestibility and minerals. Source: Ekaya 2001

This variation has implications for pastoralists. During the wet season, because grasses are of a higher nutritional value, animals put on weight, produce more milk and are in better condition. In the dry season, however, because grasses are of a lower nutritional value, livestock lose weight and are less productive. In the drylands, these fluctuations are normal and are not a result of bad pastoral management. Rather, pastoralists learn and integrate this variability into their livestock management strategies (Krätli 2015).

Low nutritional content of grass species during the dry season means that trees and shrubs are important for livestock diets during dry seasons and droughts. During the dry season, trees and shrubs generally have higher levels of water, protein, digestibility and minerals than the surrounding grasses. Access to trees during the dry season can thus provide livestock with a higher nutritional diet, thereby reducing livestock weight loss and maintaining a level of productivity that would not be possible if they only grazed on grasses (Topps 1992).

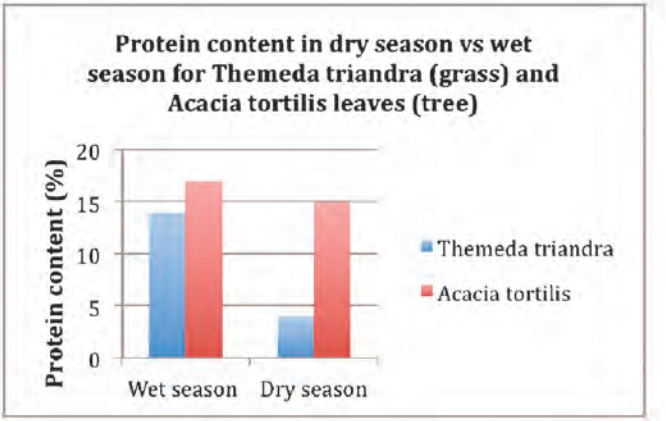


Figure 3.3 In many places, trees and shrubs are found in strategic locations, which are not of easy access to pastoralists (e.g. protected forests, wetlands, highlands). This is undermining livestock productivity during the dry season.

3.2.2 Variation in rainfall amount and distribution in time and space within the rainy season

In Ethiopia, rainfall is unevenly distributed within the rainy season. The amount of rainfall that falls in any given rainy season is highly variable in time and space. Furthermore, the distribution of rainfall from one rainy season to the next is also highly variable in time and space – no one rainy season has the same rainfall patterns as another. This means that not only is rainfall highly variable, but it is also highly unpredictable.

Figure 3.4 Rainfall is highly localised in space. This means that pastures do not grow evenly over the rangelands during the rainy season.

Rainfall variability and unpredictability is common to all areas of Ethiopia, not just the dry lowland pastoral areas. However, the degree of variability and unpredictability is higher in those areas that receive less rainfall – i.e. the dry lowlands. All pastoral areas the world over share this common characteristic – rainfall is highly localised in space, highly variable in time and thus very unpredictable.

To understand the impact of variation of rainfall in time and space on the quantity and quality of pasture, we must understand the way in which grasses and other pasture species grow.

Total rainfall amount has an important influence on natural pastures. In general, there is a correlation between the amount of rainfall and the amount of pasture that grows – i.e. the more it rains, the more pasture will be produced. This is a positive correlation between the amount of rain and the amount of biomass (pasture) produced (Figure 3.5).

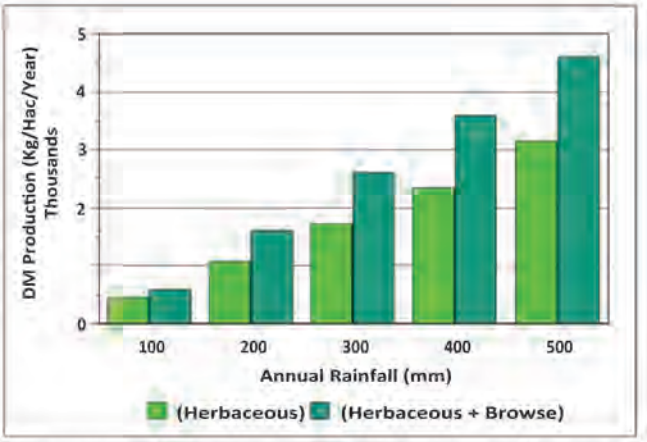


Figure 3.5 As annual rainfall increases, so too does the QUANTITY of pasture as measured in kg/ha/year. However, higher annual rainfall does not always correlate to better quality pasture in terms of minerals and protein. (Schwartz 1991. Location: Marsabit, Kenya)

However, there is not always a positive correlation between the amount of rain and the nutritional quality of pastures. Research in the Sahel shows that pastures in the northern Sahel, close to the desert, where rainfall is low, are more nutritious during the rainy season than pastures in the southern Sahel where rainfall is higher (Breman and De Wit 1983; see Box 3.3).

Box 3.3 Pasture quality in the Sahel

In the Sahel, the most nutritious pastures are found in areas of lower rainfall in the band of land just below the Sahara desert. Soils in the Sahel are generally sandy with low levels of nitrogen, phosphorous and other nutrients. Under conditions of heavy rain, these soils are easily leached and although a lot of pasture may grow it is of low nutritional value. Thus, in the northern Sahel belt where rainfall is much lower, the soils are not as badly leached and although less pasture grows it is of higher nutritional quality than many pastures found further south where rainfall is greater.

Research by Bremen and de Wit in the 1980s, calculated with water availability rising from 50 to 1000 mm annually, shows that the total mean production increases from nearly 0 to 4 metric tonnes per hectare, but the protein content decreases in the fully grown plants from 12 to 3 percent.

Thus, low water availability produces a small amount of biomass, but of good quality, and higher water availability results in more biomass of increasingly inferior quality.
Source: Breman and De Wit (1983)

Types of plants found in the drylands

Plants can be categorised into ephemerals, annuals and perennials, based on their life cycle.

- Ephemerals, as the name implies, are plant species with a short life cycle, whose seeds germinate, grow to produce new seeds and then die all in a very short time - within a year (two weeks to three months depending on the total quantity of rainfall in one season).
- Annuals are plant species with a life cycle that takes approximately twelve months or less to complete (from seed to seed).
- Perennials are a plant species that usually lives for three or more years. During the rainy season, perennials develop new growth while during the dry season they tend to lie `dormant'.

Rainfall amount and variability, as well as topography and interactions with livestock, impact on the species composition of a pasture. Annual grass species predominate in the drier lowland regions (often these will be the rainy season pastures), while perennial species are more predominant in mid-altitude and highland regions, and are more typically found in dry season pastures (see Table 3.1).

Table 3.1 Impact of rainfall amount on species composition

	Highland	Mid- altitude	Lowland
Altitude (m.a.s.l.)	1200	800	550
Annual rainfall(mm)	900	500	200
Perennials (%)	98	80	<5
Annuals (%)	2	20	60
Ephemerals (%)	0	0	35

Rainfall is variable both in the amount of rain that falls, and where and when it falls. This influences the amount of pasture (biomass) that will grow.

Evidence from the Sahel shows that even if the total annual rainfall is roughly the same from one year to the next, it is not necessarily the case that the same amount of pasture will be produced from one year to the next (Thébaud 2004; see Figure 3.6). This is because rainfall in the wet season tends to come in a `start – stop' fashion of varying amounts. In some years, the distribution of the timing and amount of rain is such that is supports the reproductive cycle of pastures, while in other years the pattern of rainfall is such that seeds do not germinate, or if they do, the subsequent distribution of rainfall does not enable them to survive and complete their cycle.

Therefore, the timing of rainfall, and its amount, can affect seed germination and the subsequent growth of the plant through to maturity and the production of new seeds. This also has implications for potential pasture growth the following year.

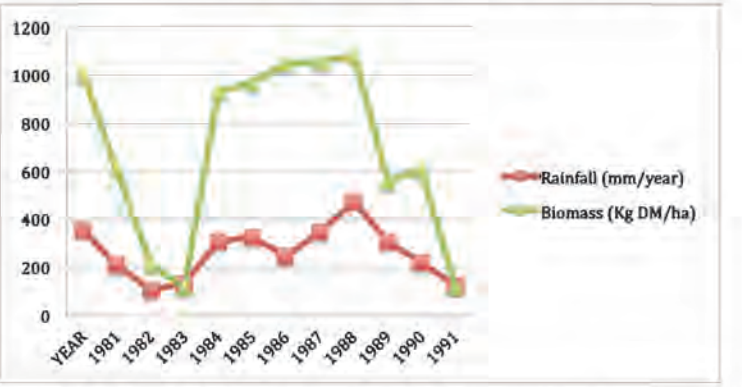


Figure 3.6 Annual rainfall and biomass production in the Sahel (northern Senegal) between 1981 and 1992. (Thébaud 2004)

The scattered and `start-stop' nature of the rainfall also means that pastures do not grow everywhere at the same time or at the same speed – pastures are at different stages in their growth cycle and growing at different rates across the rangelands throughout the rainy season. Different pastures will therefore vary in their levels of nutritional quality.

The situation is further complicated by the fact that there are different species of pasture and different soil types, all of which also have an impact on the nutritional quality of pastures.

The rangelands in pastoral areas are made up of a mosaic or patchwork of pasture areas each at different stages of growth, producing different amounts of grass and, more importantly, each offering different levels of nutritional quality.

Pastoralists' strategies to exploit this variability in pasture

This variable distribution of nutrients in pastures is not necessarily a constraint for livestock production and productivity. Pastoralists have several strategies to exploit this variability to increase the productivity of their animals.

- Livestock mobility is probably the most important strategy. Through livestock mobility, pastoralists are able to lead their animals to those areas where the pastures are at the peak of their nutritional content. In this way they are able to feed their animals on a more constant diet of high nutritional pastures throughout the rainy season than would be the case if they did not move. Mobility is therefore of critical importance.

- Selective breeding of livestock. Pastoralists are constantly reviewing the composition and the qualities of their livestock to meet their production objectives in the context of the wider ecological and economic environment. In those environments where there is high variability in pastures, pastoralists very carefully breed livestock that are able to exploit the unpredictable environment in which they live. Through controlled breeding and selection they keep animals that are not only able to reach distant pastures (through mobility), but once they are there to carefully choose those plants in the rangelands that are the most nutritious. Pastoralists have found by observing their animals that some of them are more `selective feeders' than others and are able to identify those plants that are more nutritious than others. This is called selective feeding.

- Species diversity. Most pastoralists keep several different species of livestock-camels, cattle, sheep and goats to enable them to make optimal use of the variable rangelands and pastures.

Mechanisms by which dryland plant species ensure their own survival

Dryland plants species have biological mechanisms to respond to high rainfall variability and unpredictability and thus maximise the chance of their survival as a species. These mechanisms include the following:

Ephemeral and annual grass species produce very high quantities of seed. Since rainfall, particularly at the start of the rainy season, comes in a 'start-stop' manner, seeds may germinate but then die for lack of rain. Thus, for the species to survive, plants produce a lot of seeds thereby enabling several phases of germnination to take place to coincide with sufficient and well-distributed rainfall to enable the seedlings to grow to maturity and produce the next generation of seeds.

Furthermore, plant seeds react to differences in rainfall amounts and timing to ensure that the species as a whole reproduces itself (e.g. not all germinating at the same time with some seeds lying dormant in the ground for years before they germinate). Some seeds may require very high temperatures associated with fires to successfully germinate.

The sheer quantity of seeds produced per plant can ensure long term successful germination year on year, provided the conditions are right. In some pastoral areas, there is evidence that shows that seeds can remain dormant in the ground for 20 or 30 or even more years waiting for the right conditions to come to germinate.

Perennial grass species do not need seeds to survive from year to year, but survive by maintaining a root stock in the ground during the dry season which sprouts in the rainy season or when triggered by events such as fire. Production of seeds by perenniel plants allows the plant to spread further and also creates genetic variation that makes the species more robust and resistent to disease (Figure 3.7).

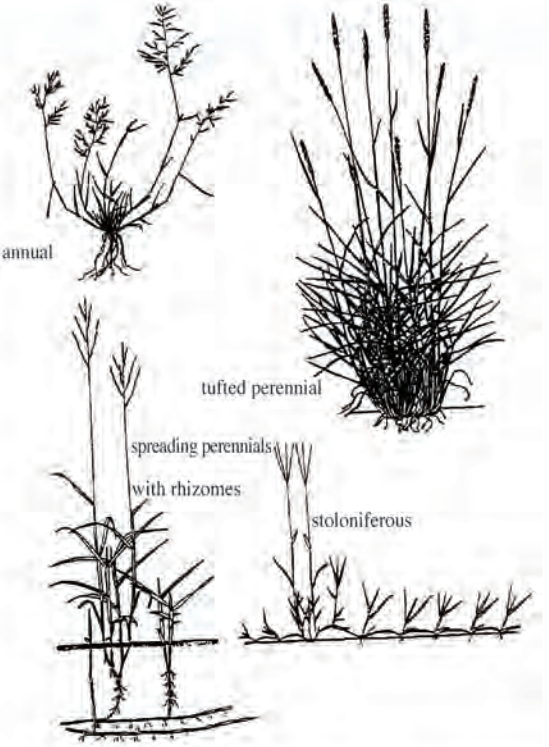


Figure 3.7 Different types of grass species, annual and perennial, showing their reproductive strategies. Rhizomes and stolons allow the plant to spread vegetatively through their root systems, without the need for seeds to germinate each year.

Plants have complex mechanisms to ensure the species is not made extinct either by erratic rainfall or animals. For example:

- Grasses react to differences in rainfall amounts and timing to ensure that the species as a whole reproduces itself (for example, not all seeds germinate at the same time).
- Grasses produce thousands and thousands of seeds to perpetuate the species.
- Grasses in drier areas generally produce more seeds per plant than grasses growing in wetter areas.
- Most grasses have various defence mechanisms to protect themselves from being over-grazed to ensure they complete their cycle and produce seeds for the next generation.

Dryland pastures are **DIVERSE, COMPLEX, ADAPTABLE** and **RESILIENT** – contrary to popular perception they are not fragile (Krätli 2015). Like other ecosystems (wetlands, highlands), they have the capacity and the potential 'to fix' themselves and to 'bounce back'. This is largely because of the seed bank in the soil. However, like all other ecosystems, the pastoral rangelands have to be carefully managed; care has to be taken not to damage or destroy their capacity to 'fix themselves'.

Box 3.4 Key points on seasonality of rainfall

1. There is a positive correlation between seasonal rainfall and pasture production
2. Rainfall has an impact on the species composition of pastures
3. Rainfall amount within the rainy season varies from one year to the next
4. Not all rainfall events are useful for good pasture growth
5. Even if total rainfall in a season or year is about the same, the amount of pasture biomass produced is not necessarily the same
6. Rainfall in pastoral areas is unevenly distributed in space and time, is unreliable and unpredictable
7. Implication of (6) is that the quantity and nutritional QUALITY of pastures are also scattered in time and space, and mobility is essential to reach these pastures.
8. Through mobility and selective feeding, livestock are able to get a higher nutritional diets than they would if they remained sedentary. This maintains or increases their productivity.
9. Dryland plants produce thousands and thousands of seeds, which germinate in different phases according to rainfall.
10. Dryland pastures have mechanisms and physical structures which enable them to thrive in their environment.
11. Dryland pastures are diverse, complex and resilient.

3.2.3 Inter-annual variability of rainfall and drought

So far we have mainly considered the impact of variation in rainfall on pasture production within the year. Between years, irregular rainfall and periodic drought are also normal characteristics of dryland areas in Ethiopia, and pastoral systems have strategies to manage this uncertainty.

One of the defining characteristics of pastoral areas is a high level of variation in rainfall from one year to the next.

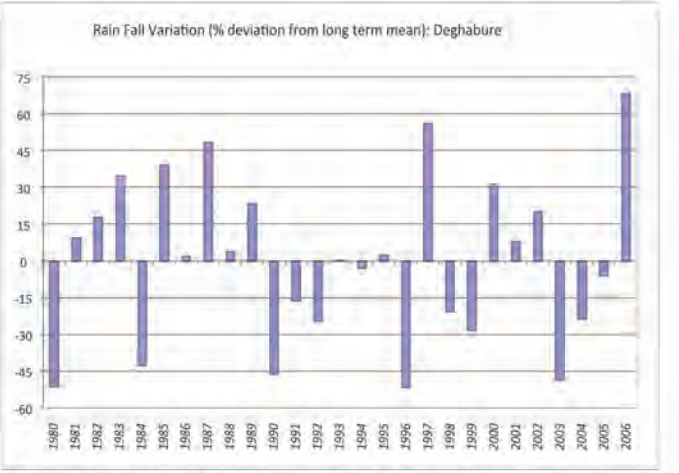


Figure 3.8 Rainfall variation in Deghabure, Ethiopia between 1980 and 2006. Mean annual rainfall over this period was 362mm per year. However, in only 8 out of 26 years was rainfall close to this mean – most years the rainfall was either far greater than or far less than 362mm (FIC & IIED 2013)

The historical records in Figures 3.8 and 3.9 show that large variations in annual rainfall, and frequent droughts are common: these are normal phenomena in pastoral systems of East Africa and Ethiopia.

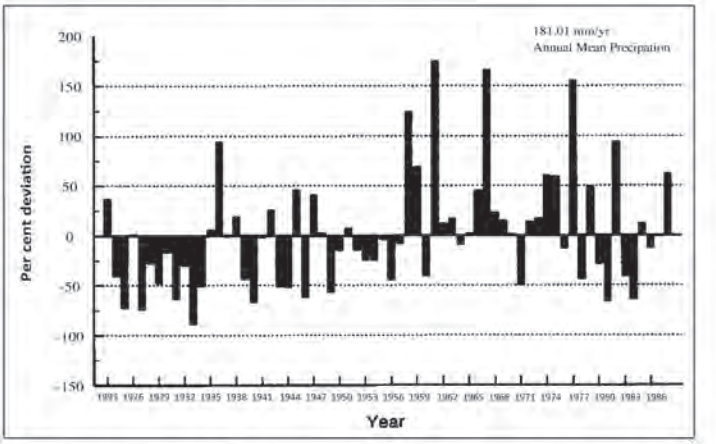


Figure 3.9 Deviation from the mean of rainfall in Lodwar, Kenya. There were very high levels of variation in rainfall between 1923 and 1986. In this case, the mean annual rainfall was 181 mm per year, but there were only 8 years out of 43 years that rainfall levels were within 10 per cent of this long term mean (Behnke et al. 1993).

3.2.4 Climate change and rainfall in pastoral areas

There is a high degree of agreement between the different climate change models of likely trends in the East African region, unlike many other parts of the world (IPCC 2014). This can therefore give us some confidence in their projections. The models all agree that:

- Temperatures will rise.
- In the medium term, there are likely to be successive years of poor rains, increases in drought-related shocks, and more unpredictable and sometimes heavier rainfall.
- In the longer term, seasons are likely to shift in time with more intense rainfall.

However, not all models agree on how the start or the end of the rains will be impacted, or on what will happen during the dry season.

These changes are likely to have an impact on the growth of pastures and availability of water. A greater frequency of drought is also likely to have an impact on herd density and overall productivity of the pastoral production system (Thornton and Herrero 2010).

However, pastoralists are already well adapted to rainfall variability and utilise a range of strategies, institutions and networks to enable them to respond to climatic uncertainty, for example through livestock mobility and switching herd species composition (Chapter 4). Given the right policies and support, pastoralists can continue to adapt to climate change, and have an important role to play in these areas where other land uses and livelihoods are more likely to fail (see Chapter 8 for more on the opportunities and constraints of climate change).

Box 3.5 Key points - pastoralism and drought

Historical records show large variations in annual rainfall, and frequent droughts are common; these are normal phenomena in pastoral systems of East Africa and Ethiopia.

Climate change models predict increased variability of rainfall in the region.

'Downscaled' models indicate an increase in rainfall in the main rainy season due to more intense downpours.

3.2.5 Pasture management - the interaction between livestock and pasture

In this section we look at the interaction between animals and plants, and again must start by understanding more about the nature of plants and their reproductive cycle.

Once the rainy season is over there is little or no new pasture growth. Annual grass species will die, while perennial grass species lie dormant. Grass growth during the rainy season therefore represents the feed supply over both the rainy and the dry season. The amount of grass that remains at the start of the dry season is called the **standing biomass.**

The standing biomass at the end of the rains represents the total amount of pasture available for livestock until the next rainy season and as such represents an important source of food for livestock during the dry season, which has to be carefully managed. The standing biomass will reduce throughout the dry season for a number of reasons:

- It may be eaten, by livestock and wildlife as well as termites, birds and rodents.
- It may be damaged by wind and also by unseasonal heavy rain.
- It can be trampled by livestock or wildlife.
- It can be destroyed by fire.

Since the grass does not grow, any losses are irreversible until the next rainy season begins and new annual grasses germinate or perennial grasses start growing again.

Managing the speed at which this standing biomass is eaten over the dry season before the arrival of the next rainy season is very important. If it is eaten too quickly, livestock will suffer and there may be erosion. However, if standing biomass is not eaten, it can hamper the sprouting of fresh pasture and over time lead to bush encroachment.

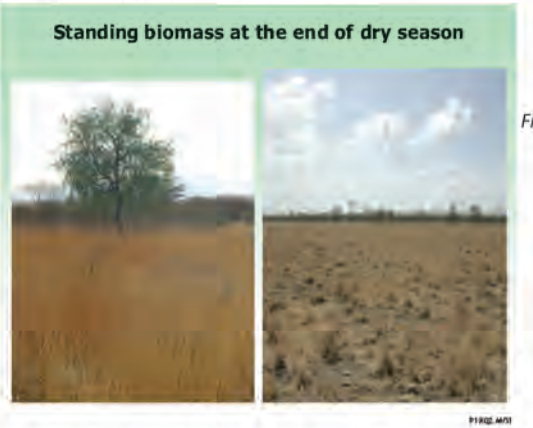


Figure 3.10 The standing biomass at the end of the rains represents the total amount of pasture available for livestock until the next rainy season.

Ideally, the standing biomass should be consumed gradually over the dry season to ensure it lasts until the arrival of the rains and the growth of fresh new pasture. If it is consumed too quickly, animals may have nothing to eat until the arrival of the next rainy season. Furthermore, depleting all the standing biomass may lead to a greater risk of wind and water erosion of the soil. However, if the standing biomass is not sufficiently consumed by the end of the dry season, there is a risk it rots when the rains come, forming a sodden layer that prevents the sprouting of new pasture.

Contrary to popular belief, livestock can benefit pasture and the environment and do not necessarily degrade or destroy the environment. Grazing livestock (or wildlife) play an important role in promoting healthy pasture growth (McNaughton 1979). In addition to enhancing the natural regeneration of plants and reducing excessive litter cover, livestock have other beneficial impacts on pastures and the environment. These include:

- Trampling of the soil and the burying of seeds
- Transporting of seeds on their coats
- The natural regeneration of trees (through digestion)

However, just as with any production system, under certain conditions, livestock may also degrade the environment and damage its potential 'to fix' itself. Overgrazing may be defined as when pasture is exposed to intensive grazing for extensive periods of time without sufficient time to recover. There must be a minimum residual level of plant cover (both annuals and perennials): (i) to avoid soil erosion and thus the loss of the seed bank; (ii) to avoid soil compaction affecting germination; and (iii) to enable the re-growth of perennial grasses.

According to the United Nations Convention to Combat Desertification (UNCCD), degradation occurs when there is a reduction or loss of the biological or economic productivity of the land under different production systems as a result of the impact of those production systems and/or other human activities (Box 3.6).

In the drylands of Ethiopia, a major cause of the loss of biological and economic productivity of the rangelands would be caused by the loss of the seed bank in the soil. Given the huge extent of the rangelands, covering hundreds of thousands of square kilometres, this is very unlikely to happen under pastoral management strategies where livestock are highly mobile.

Box 3.6 Definition of desertification and degradation according to the United Nations Convention to Combat Desertification (UNCCD)

For the purposes of this Convention (Art 1):

"'desertification' means land degradation in arid, semi-arid and dry sub-humid areas resulting from various factors, including climatic variations and human activities;

'land degradation' means reduction or loss, in arid, semi-arid and dry sub-humid areas, of the biological or economic productivity and complexity of rainfed cropland, irrigated cropland, or range, pasture, forest and woodlands resulting from land uses or from a process or combination of processes, including processes arising from human activities and habitation patterns...".

Source: United Nations Convention to Combat Desertification (1994, pp. 4-5)

The UNCCD definition has been criticised for suggesting that degradation only occurs in arid, semi-arid and and dry sub-humid areas. The reduction or loss of biological or economic productivity of land can occur in all ecosystems if they are badly managed (e.g. rainforests).

However, overgrazing and degradation of the rangelands can occur under specific conditions:

- At the start of the rainy season when seeds begin to germinate. If animals are sedentary, they will continuously graze and trample the new shoots and prevent the grasses completing their annual cycle and producing seeds for the next generation of pastures. This is particularly important where annual species dominate. Over time, this may lead to the disappearance of certain species of grass. However, if animals are free to move, once the rains are well-established, they will disperse.

- **At the end of the rainy season before annual and perennial grasses have had a chance to produce their seed for the next crop.** Again, if animals are unable to move, there is a danger that they will eat and trample the grasses before they produce their seeds. Over time, this may lead to the disappearance of certain species of grass.

- **When animals are sedentary and graze the same area throughout the rainy season.** This will prevent the pastures completing their reproductive cycles.

- **When animals repeatedly walk along the same paths** as this will contribute to gully formation and soil erosion.

Livestock MOBILITY reduces the risk that degradation will occur in the drylands of Ethiopia, for the following reasons:

- Most grasses produce hundreds of thousands of seeds and it is very unlikely livestock will eat them all.
- Certain grasses protect themselves from over-grazing.
- Due to erratic and scattered rainfall, not all seeds germinate at the same time within the season or between years.

- Livestock never eat the whole plant; they crop it and move on thereby allowing the plant to re-grow. Some plants benefit from being eaten.

By being mobile, livestock allow plants to recover and help stimulate plant growth, reducing the risk of degradation. Livestock mobility is a key pastoral management strategy that pastoralists use to access variable and patchy resources, and it helps them maintain high livestock productivity. Mobility is also important to avoid problems such as drought, disease, conflict and wildlife. Mobility is discussed further in the next chapter; 'Pillar Two – the herd'.

References and further reading

Abebe, Y.D., and Geheb, K. 2003. Wetlands of Ethiopia. Proceedings of a seminar on the resources and status of Ethiopia's wetlands. IUCN Wetlands and Water Resources Programme.
https://portals.iucn.org/library/efiles/documents/wtl-028.pdf

Behnke, R.H., and Kerven, C. 2013. Counting the costs: replacing pastoralism with irrigated agriculture in the Awash Valley, north-eastern Ethiopia. IIED Climate Change Working Paper No. 4. IIED: London.
http://pubs.iied.org/10035IIED.html

Behnke, R.H., Scoones, I., and Kerven, C. 1993. Range ecology at disequilibrium: new models of natural variability and pastoral adaptation in African savannahs. London: ODI/IIED.

Breman, H., and De Wit C.T. 1983. Rangeland Productivity and Exploitation in the Sahel. Science, 221(4618), 1341-1347.

Coughenour, M.B. 1991. Spatial components of plant-herbivore interactions in pastoral, ranching, and native ungulate ecosystems. Journal of range management, 44(6), 530-542.
https://journals.uair.arizona.edu/index.php/jrm/article/viewFile/12870/12147#page=4

Davies, J., Poulsen, L., Schulte-Herbrüggen, B., Mackinnon, K., Crawhall, N., Henwood, W., Dudley, N., Smith, J., Gudka, M. 2012. Conserving Dryland Biodiversity. International Union for Conservation of Nature (IUCN): Nairobi, Kenya.
www.unccd.int/Lists/SiteDocumentLibrary/Publications/drylands_bk_2.pdf

Ekaya, W.N. 2001. Nutritional characteristics of selected grass and browse species from Kenya's pastoral ecosystem. Journal of Human Ecology 12(3): 171-175.

FIC & IIED. 2013. Pastoralism and pastoral policy in Ethiopia. Facilitators manual Module 1. Feinstein International Centre, Tufts University and International Institute for Environment and Development.

Flintan, F., Behnke, R., and Neeley, C. 2013. Natural Resource Management in the drylands in the Horn of Africa. Brief prepared by a Technical Consortium hosted by CGIAR in partnership with the FAO Investment Centre. Nairobi
http://globalallianceforaction.com/docs/Natural%20resource%20management.pdf

IIED/SOS Sahel 2009. Modern and mobile. The future of livestock production in Africa's drylands. Edited by de Jode, H.
http://pubs.iied.org/12565IIED.html

IPCC 2014. Chapter 22, Africa, In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part B: Regional Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.
www.ipcc.ch/pdf/assessment-report/ar5/wg2/drafts/fd/WGIIAR5-Chap22_FGDall.pdf

Krätli, S. 2015. Valuing variability: New perspectives on climate resilient drylands development. IIED. Edited by de Jode, H.
http://pubs.iied.org/10128IIED.html

McNaughton, S.J. 1979. Grazing as an optimization process: grass-ungulate relationships in the Serengeti. American Naturalist, 691-703.
www.jstor.org/stable/2459961?seq=1#page_scan_tab_contents

Niamir-Fuller, M. 1999. Managing mobility in African rangelands. Pp 102–132. In McCarthy, N., B. Swallow, M. Kirk, and P. Hazell, editors. Property rights, risk, and livestock development in Africa. International Food Policy Research Institute and International Livestock Research Institute. Washington, D.C., USA.
www.ilri.org/InfoServ/Webpub/fulldocs/PropertyRights/Chapter7.htm#TopOfPage

Scoones, I. 1992. Wetlands in Drylands: Key resources of agricultural and pastoral production in Africa. Drylands Issue Paper No. 38. IIED: London.
http://pubs.iied.org/7287IIED.html

Speedy, A., and Pugliese, P.L. 1992. Legume trees and other fodder trees as protein sources for livestock. Proceedings. FAO Animal Production and Health Paper (FAO).
www.fao.org/docrep/003/t0632e/T0632E00.htm#TOC

Thébaud, B. 2004. Le pastoralisme au Sahel: module d'animation et de formation. ARED, Associates in Research and Education for Development.

Thornton, P.K., and Herrero, M. 2010. The inter-linkages between rapid growth in livestock production, climate change, and the impact on water resources, land use, and deforestation. Background paper for the 2010 World Development Report, Policy Research Working Paper 5178, The World Bank, Washington, US.
https://openknowledge.worldbank.org/bitstream/handle/10986/9223/WDR2010_0002.pdf?sequence=1

Tolossa, D., and Baudouin, A. 2004. Access to natural resources and conflicts between farmers and agro-pastoralists in Borkena Wetland, north-eastern Ethiopia. Norsk Geografisk Tidsskrift-Norwegian Journal of Geography, 58(3), 97-112.

Topps, J.H. 1992. Potential, composition and use of legume shrubs and trees as fodders for livestock in the tropics. The Journal of Agricultural Science, 118, 1-8.
http://journals.cambridge.org/download.php?file=%2FAGS%2FAGS118_01%2FS0021859600067940a.pdf&code=63878ce36b9ab927a52396b9fb4b0cce
United Nations Convention to Combat Desertification (UNCCD) 1994.
www.unccd.int/Lists/SiteDocumentLibrary/conventionText/conv-eng.pdf

4. Pillar Two – the herd

Summary

This chapter introduces Pillar Two of the pastoral system - the herd, and looks at how the herd is managed in response to the natural resources available. Pastoralists use a number of known strategies to maintain an optimal balance between pastures, livestock and people:

- Pastoralists actively manage their herd composition and structure:
  - Keeping different species of animals of local or mixed breeds each with different characteristics adapted to the environment in which they live, manages risk and ensures the maximal use of variable and scattered resources.
  - Indigenous breeds are better able to make optimal use of variable resources, and are more resistant to drought and disease.
  - Managing the age-sex composition of their herds allows a family to respond to the immediate and long-term requirements of the family. Animals are needed to produce milk, they are needed for reproduction, others are needed for cash; social obligations; insurance against risk; etc. Managing the right age-sex balance is a complex, full-time and difficult task, especially in an environment characterised by variable and unpredictable resources.

- Pastoralists have different rights of ownership and use of their herds:
  - Few people actually have total rights over large herds. Different members of the family will have different rights of ownership and use over different animals. This helps to meet the day-to-day needs of the family and ensure the future viability of the herd and family.
  - Increasingly, because of poverty, pastoralists are looking after the animals of non-pastoralists, and this is bringing other problems, such as reduced mobility.
- Livestock diseases are a major constraint to livestock production in pastoral areas in Ethiopia and beyond. Pastoralists use mobility to evade disease, although access to veterinary services is also very important.
- Although livestock feed largely on natural pastures such as grasses, shrubs and trees, hay is a potential nutritious source of livestock feed in the drylands of Ethiopia.
- Pastoralists actively manage their herd structure to avoid risk and lessen the effect of drought by:

- Investing in animals, particularly fertile females, to build up herd size as an insurance against drought, disease and raiding.
- Selecting animals not only on the basis of cultural values, but also for their genetic potential (e.g. drought resistance, fertility, good milk yields, etc.).
- Remaining mobile.
- Splitting their herds to lessen the risks of over-grazing and exposure to disease and other risks.
- Loaning animals `surplus' to subsistence requirements to family and friends as a form of social capital to protect against future drought and other risks.
- Only selectively marketing their animals during drought, so that the herd can quickly multiply and grow following drought.

- Mobility is an important strategy pastoralists use to maintain high livestock productivity; to avoid problems such as drought, disease, conflict, wildlife; to access markets; and for social and cultural reasons. Mobility is becoming increasingly constrained due to the conversion of rangeland to alternative land uses, political and administrative boundaries, and insecurity amongst others. This is reducing pastoralists' capacity to mitigate against risk, leading to increased vulnerability, poverty and conflict.

Brainstorming questions

1) What is the future for livestock mobility in a modern state?
2) What are the comparative benefits of pastoralism versus other forms of raising livestock, such as ranching, in rangeland areas?

4.1 Livestock production systems

In a pastoral system, the livestock herd refers to the animals on which a pastoralist family depends, and for which they care. Pastoralism is different from other forms of livestock production, such as ranching, found in Ethiopia and other parts of the world. Although livestock development programmes in African rangelands have historically been based on the systems of livestock ranching found in the USA, Australia and Europe, there are fundamental differences in the objectives of ranching and pastoral systems.

In ranching systems, productivity is measured in terms of the weight of beef produced per year, sold for meat or for fattening by others. However, in a pastoral system, meat production represents only one part of the use made of livestock. Pastoralists extract value from their livestock throughout their lives and postpone slaughtering them so long as they have potential use for the herd of the family – to grow the herd, provide milk, or to provide a bride price or other social value associated with the exchange of live animals. Meat is considered 'a residual benefit to be realised only at the end of an animal's productive career' (Behnke 1985b).

In contrast, ranching is a predatory system in that it exploits animals by killing them in their prime, yet does everything possible to ensure their well-being up to the time of slaughter.

Thus, rather than considering meat production when comparing the productivity of these two systems, a fairer comparison would compare protein production and food energy. When this comparison was made between a Borana pastoral production system in southern Ethiopia and an Australian commercial ranching system, the Borana system was found to produce nearly four times as much protein and six times as much food energy from each hectare (Cossins 1984).

The herd, in a pastoral context, is thus managed to support the ongoing needs of a pastoral family, providing meat, milk, one-off and regular cash demands, and the social and economic demands of a family today, tomorrow and into the future.

4.2 Livestock management practices

4.2.1 Herd composition

Herd composition refers to the number of different species (e.g. camels, goats, sheep, cattle) and breeds (e.g. Zebu, Borana and Jersey cows) within a herd. Herd composition is determined largely by local environmental conditions: some species and breeds are more resistant to drought or disease, and different species have different dietary needs. However, herd composition also depends on the socio-economic status of the family and other factors. For example, some breeds are able to cover greater distances, some produce more milk, some reproduce more

quickly and different species and breeds have different values at market.

Pastoralists in East Africa and Ethiopia usually keep several species and breeds of livestock within the family herd. There are major advantages in diversifying the livestock within the herd, whether to meet different needs and objectives or to better manage the variable environment. For example:

- Different species are better able to exploit the very varied pastoral environment – cattle and sheep graze off grasslands, while goats and camels prefer browse. This makes good use of the available resources, as well as managing risk where rainfall is highly unpredictable over time and space.
- Different species are able to exploit the different seasons in different ways – goats and camels prefer to feed off tree products and keep producing milk in the dry season when milk productivity of sheep and cows decline.
- Different species have different roles – donkeys and camels are used for transport; goats are sold to meet immediate household needs or slaughtered to feed a guest. Cows provide milk and blood.
- Small stock are of lower value and can more easily be sold to meet occasional cash needs.

- If disease strikes, not all species may be affected, spreading the risk.

Diversifying the herd also comes at a cost. For example, different species may have to be taken to different pastures depending on their dietary and water needs; this requires extra labour.

Box 4.1 Definitions of livestock terms

Species: A group/classification of organisms, consisting of individuals actually or potentially sharing a common gene pool: they produce viable offspring.

Breed: A race of animals within a species. Animals of the same breed usually have a common origin and similar identifying characteristics.

Herd resilience: The ability of a livestock herd to bounce back (recover) to usual levels of production, health, reproduction, etc. following a stressful period e.g. feed and water scarcity during drought.

Figure 4.1 The diversification of species and breed has advantages in terms of herd economics, productivity and resilience. Research in Niger shows how Wodaabe pastoralists breed cattle that are able to exploit the unpredictable environment in which they live, accessing and selecting the most nutritious grasses available. This allows their animals to make the best use of the variable pasture conditions in the rangelands (Krätli 2010).

Box 4.2 Indigenous versus imported breeds

Indigenous breeds are better adapted to their environment. They can produce meat and milk from natural pastures with limited inputs. If they can access nutritious pastures all year round, they are highly productive. They are more resistant to local diseases. They are better able to withstand the dry season and difficult watering conditions, and periodic droughts.

Imported breeds require a lot of inputs if they are to maintain high productivity. They are more susceptible to disease, and find it harder to cope with water and heat stress. While it is recognised that Holstein cows from Europe produce more milk than Borana cows, it is largely because of the conditions in which they are reared (high nutritious diets supplemented with growth hormones, very sedentary conditions thus very little energy used, etc.). A Holstein cow, if it has to live off the pastures in Ethiopia, will die, whereas a Borana cow will produce milk and meat.

In selecting breeds, pastoralists choose those most adapted to the local environment and their objectives. Indigenous species often have merits over cross-bred and exotic breeds as they are well adapted to mobility and very large variations in feed availability. For example, a study on Horro sheep found the breed well adapted to high seasonality in forage availability due to `compensatory growth' (Abegaz et al. 1996). Sheep grazed on natural pasture with no supplementary feed lost weight during the dry season, while supplemented lambs continued to gradually gain weight over the same period. Following the rains, however, the unsupplemented lambs which had lost weight caught up with the weights of the continuously supplemented lambs within two months.

Compensatory growth can be defined as the rapid weight gain that follows a period of reduced nutrient intake of an animal, when it is placed back on a high quality diet. Compensatory growth is believed to be due to a reduction in maintenance energy requirements under stress, leading to more efficient feed conversion, and has been seen in zebu and other indigenous breeds of livestock.

Box 4.3 Key points – herd composition

- Pastoralists in East Africa and Ethiopia keep several species and breeds of livestock.
- This diversification of species and breed has advantages in terms of herd economics, productivity and resilience, complementarity in resource use spreading of risk.
- Pastoralists raise indigenous species and breeds that have preferred merits over cross-bred and exotic breeds.

4.2.2 Herd structure

The herd structure refers to the different types of animals from within the same breed (e.g. male and female, castrated and uncastrated, old and young, etc.). As we have seen above, a pastoral herd serves multiple functions:

- It must produce meat and milk for family consumption to sustain the health and growth of the family.
- It must provide a potential source of cash to meet cash demands of the family- for health, foods, and veterinary and education costs.
- It must sustain itself through reproduction and grow to offset losses due to drought, disease and old age.

A herd is composed of animals of different ages and sexes, based on the objectives of the production system or the socio-economic status of the family (Table 4.1). There is no single herd structure – the structure of the herd will depend on the context and the objectives of the herd owner. A herd that has suffered major losses will need to be skewed towards reproductive females to rebuild the herd, whereas a herd being kept more as a capital investment might be skewed towards steers that can be easily sold.

Table 4.1: Different purposes served by cattle of different ages and sex

Category	Purpose
Male and female calves (0-3 years)	These animals represent the future capital of the family's herd.
Heifers (2-5 years)	These animals represent the future cows of the herd that will produce milk and more calves.
Bullocks (2-5 years)	These animals represent the future steers that will be sold to raise cash to pay school fees, buy cereals, etc.
Cows (+ 4-5 years)	The animals are needed to produce milk for the family food needs and sale (fresh or sour milk, butter, etc.). Cows are also needed to give birth to male and female calves.
Steers (+ 4-5 years)	Steers are sold to raise cash to pay for food, school fees, health care (both human and livestock) etc. They may also be used for special ceremonial purposes.
Bulls	A bull is needed to inseminate cows

Pastoralists actively manage their herd structure. For example, a typical Borana cattle herd in 1997 was made up of 63 per cent female and 37 per cent male animals (FIC & IIED 2013). In the past, pastoralists used to barter animals. In recent years, pastoralists are increasingly buying and selling animals on local markets to manage their herd structures.

Pastoralist groups have specific names for animals depending on their age, sex, and species – this is a reflection of the importance and complexity of maintaining a herd that responds to the needs of the family (Table 4.2).

Table 4.2: Names given to livestock of different ages, species and sex by different pastoralist groups within Ethiopia (FIC 2013).

Livestock	Afar	Hamer	Borana	Somali
Cattle		Wonga/Kolla	Loon	Loo
Cow	Sega	Wongo	Seha	Saa
Bull	Awru	Zia	Korma	Dibi
Ox		Bua	Senga	Sagab
Steer		Ota Gima	Jibicha	Sagab
Heifer	Be'ra	Keteb	Goromssa	Qaalin
Calf	Rugage	Oto	Jebii	Wella
Sheep		Yana	Holla	Laha
Ewe	E'da	Yano	Hawicha	Lah
Ram	Moru	Yata	Elemo	Wan
Lamb	Me'rea	Yati Boko	Kerso	Wan
Goat	Re'ita	Kuli	Lelessaa	Rii / Ari
Buck	De'behe	Kuli Zeaya	Korpesa	Urgi
Doe	Raita	Kulu	Hawiti	Rii
Kid	Bukele	Kuli Boko	Karota	Wahar
Camel	Ga'lla	Gamele	Gala	Ga'lla or Geel
Male	Rekuba	Gamalta		Rite
Female	A'la	Gamalto		Haal
Young	Nerige	Gamalta Gima	Ogore	Nirig/Qurbaa

Finally, herd structures are changing. In some pastoral areas, pastoralists are increasingly keeping male animals for sale on the market as they become increasingly integrated into the cash economy – for school fees, electronic equipment, mobile phones, veterinary drugs, etc. And in East Africa and Ethiopia today, an increasing number of livestock are owned by non-pastoralists who use them as investment.

These changes impact men and women in pastoral families differently. For example, fewer female animals in a herd results in less milk being produced for the family. Depending on the amount of milk, the size of the family and the nutritional quality of alternative foods being bought, this might impact negatively on family nutrition, especially of children. Less milk available for sale might also weaken women's economic position within the family and in society at large.

Figure 4.2 Changing herd composition can impact directly on gender power relations within a household as well as child health; fewer female animals in a herd result in less milk being produced for the family; less milk for sale weakens women's economic position.

Photo Credit:
Kate eshelby
I.STS/S14

Box 4.4 Key points – herd structure

- Pastoralists carefully manage the age and sex ratios of their herds to balance the number and category of animals to meet family needs TODAY while planning for the FUTURE.
- Generally, pastoralists keep more female than male animals so as to get enough milk for the family TODAY while ensuring the birth of future animals for TOMORROW.
- In some pastoral areas, herd structures are changing as pastoralists move into a monetised economy. This may have different impacts on men, women and children within society.

4.2.3 Herd ownership and control

A common misconception of pastoralism is an assumption that a pastoralist caring for a large herd owns and controls all the livestock within that herd. This has contributed to the myth than many herders keep huge livestock herds for prestige or are resistant to selling their animals.

Box 4.5 Case studies (FIC 2013)

Galgallo Jillo is a Borana pastoralist living around Dubluk. He is Abba Ella (Konfi). He is responsible for herding 200 cattle, but he has only 10 cattle over which he has total rights. The remaining 190 are owned by relatives and for these, Galgallo can only make herding decisions

Sora Arero lives in Dirre and is responsible for 65 cattle, of which only 35 are under his control. The remaining 30 are owned by three other relatives.

Where the herd belongs to a single family, animals may be owned by different individuals within that family – gifted to wives, children or siblings and therefore the herder will not be authorised to dispose of those animals without the owner's consent. Specific animals in a herd may also be owned by members of a different family. Allocating different rights of use over different animals to meet the day-to-day needs of the family helps ensure the future viability of the herd and family. See Chapter 5 for more on how the multiple types of ownership and rights attributed to individuals within and between families over specific animals helps create social capital and forms of mutual obligation and assistance.

Livestock are increasingly owned by non-pastoralist or absentee owners, such as farmers, traders and civil servants, who see their herds purely as a form of investment. There can be specific risks associated with herds, including a high proportion of animals belonging to non- pastoralist or absentee owners. Absent herd owners limit the power of the herder to make decisions about the size and composition of the herd, and also if and when to move to find better pasture or conserve dry season pastures. This situation can be exacerbated with severe drought, when pastoralists must sell cattle in poor conditions for very low prices under duress (as we saw in Chapter 3, this impacts on the quality of natural pasture for other pastoralist families).

Box 4.6 Key points – livestock ownership

- The rights of use and ownership of livestock in a herd is complex. Most herds are composed of animals belonging to several people, and to which different people have different rights of use and ownership categories.
- In East Africa and Ethiopia today some livestock are owned by people who do not herd them on a daily basis, but use them as investment. This situation limits the power of the herder to make decisions.
- The above scenarios have often lead 'outsiders' and casual observers to conclude that pastoralists keep too many animals, and therefore need to destock e.g. through sale.

4.2.4 Livestock health

Livestock diseases are a major constraint in the pastoral areas of Ethiopia. Even when livestock disease is not fatal, livestock diseases impact significantly on productivity, fertlity, and are often subject to trading bans. Mobility has often been the most effective management tool available to manage disease load. For example, moving away from areas with dense vegetation during the rainy season reduces the risk of East Coast Fever. Constraints to mobility, as well as lack of access to veterinary services are the greatest challenge to livestock health in pastoralist areas.

Figure 4.3 CAHWs are community members who have received basic, non-formal training in animal healthcare and who prevent and treat animal diseases within their communities.

The provision of livestock health services has historically been highly centralised in Ethiopia, with livestock clinics and government controlled veterinary services based out of urban centres, far from where their services are needed, and poorly resourced with minimal mobility. Community Animal Health Workers (CAHWs), members of the local commuity trained and equipped to vaccinate and treat basic health needs, have long been supported by non-governmental programmes, but until recently have been technically illegal in Ethiopia. More recently, the national Plan for Accelerated and Sustained Development to End Poverty (PASDEP) recognises CAHW's and mobile clinics as part of its support to the pastoral production system. See Chapter 6 for a more in-depth anaylsis of the policy environment and its impacts on animal health.

4.2.5 Livestock feed

Livestock fodder can come from natural pasture (grasses, shrubs and browse plants), fodder crops (such as alfalfa), from crop residues such as maize, sorghum, cotton or sugar cane), hay, and industrial by-products (such as molasses and cottonseed cake). Here we consider hay as a livestock feed and some of the opportunities and constraints it provides.

Hay as feed for livestock in the drylands of Ethiopia

Hay is grass harvested during the rainy season while still green and before it has produced seeds. This grass is then dried and transported to a barn to keep it dry before it is used. Hay is a very nutritious source of feed if properly harvested and stored.

In some pastoral areas (e.g. Borana), women are practising haymaking on a small scale to feed small and sick animals during the dry season. Haymaking is also increasingly popular near large urban centres, where merchants and livestock traders pay people to harvest natural pastures to feed urban-based livestock for fattening.

While there are benefits associated with haymaking in the drylands of Ethiopia, there are considerable constraints and costs associated with the production and use of hay and other fodder crops for pastoralists:

- Haymaking requires a lot of labour during the rainy season to harvest, to dry, to transport and to store. Not all families may have enough spare labour to do this, or the means to transport the hay. It also takes labour away from managing the herd to accessing nutritious pastures.
- Haymaking requires capital investments, which may not be available to every family: tools to cut the hay, a means to transport the hay, a barn or place to store the hay to keep it from getting wet. Many pastoralists are mobile and thus moving the large quantities of hay may be difficult.
- A lot of hay is required to feed livestock during the dry season.
- Haymaking can cause conflict if it involves harvesting fresh grass from common property areas used by other members of the clan or group. Some groups consider this a form of privatisation of the common property pastures.
- The hay has to be harvested while still green and before it produces seeds because once grass begins to produce seeds, its nutritional value declines. This results in a depletion of the seed stock in the ground.

In Chapter 3 we saw how rainfall, soil, fire and livestock can impact on the quality as well as the quantity of pasture, the relative advantages of annual grass species vs perennial grass species, and the importance of browse to maintain livestock health and growth. Pastoral indigenous knowledge of fodder plants is extensive, and an essential component of herd management. Women may be the first to notice when the quantity or quality of pasture starts to impact on the herd, through the quantity and quality of milk she is able to take from the cow, and the impact on the calves under her care.

4.3 Constraints to livestock production

The growth rate of a herd is the net value of the increase in herd size (due to birth, buying new animals, animals gifted into the herd, inheritance, loans into the herd, etc.), less the rate at which animals leave the herd (due to death, sales, slaughter for meat, gifts out, etc.).

In the short-term (two-three years), it is possible that a herd can grow in size quite quickly. In the longer-term (20 years), the natural growth rate of livestock is relatively slow, and there are many constraints affecting the rate at which a herd can grow. It is important to understand what these constraints are and their impact on the herd and the pastoral family.

Different types of animals have different reproductive rates: sheep and goats often have twins and have a shorter birth period than cattle or camels so their numbers can grow much more quickly (Table 4.3). Diet and disease can affect reproductive rates -poor nutrition and drought will lead to longer birth intervals, and mortality will be highest among calves due to lower milk production. Other factors that impact the rate at which a herd can grow include:

- Diseases (livestock to livestock and/or wildlife to livestock).
- Severe drought.
- Raiding, particularly in certain areas.
- Access to markets/social networks.
- Labour shortages.

In good years livestock increase in number, but in bad years they die. Every year animals are also sold to raise money to buy food, pay taxes, cover health expenses etc. The natural growth rate of a herd over a 20-year period is thus very slow in Ethiopia and elsewhere, and it is very difficult for pastoralists to double the size of their herds, unless they buy animals in high quantities or go raiding.

Table 4.3 Typical average annual growth rates of pastoral livestock herds over a 20-year period. Based on data and estimates from arid northern Kenya. (Dahl and Hjort 1976)

Camels	1.5%
Cattle	3.4%
Sheep	18%
Goats	33%

4.3.1 Herd dynamics and drought

While disease, labour and other factors play a role in the potential growth rate of livestock herds, the **major factor limiting herd growth over time is the dynamics of natural pastures.** Even if disease and raiding are removed, the seasonal and annual variations in the **QUALITY** and, to a lesser extent, the quantity of pasture, is still a

major factor limiting the growth of livestock numbers in the pastoral areas of Ethiopia. Drought is arguably the most important determining factor of all. As a result, pastoralists have developed a number of strategies to respond to drought to mitigate livestock losses where possible (Oba and Lusigi 1987).

The main strategy to mitigate for variation in pasture quality and quantity is MOBILITY. Before looking at mobility in detail, we will look at specific responses in pastoral areas to severe drought.

Pastoralists drought response strategies

A severe drought occurs where rainfall fails over one or more rainy seasons. In a drought, even if some rain falls, this will be more scattered and unpredictable in time and space, and there will be less biomass and water available at the start of the following dry season. Pastoralists will need to move their animals more often and over longer distances in search of pasture and some may move very long distances to 'drought-refuge' areas. These conditions result in a deterioration in both livestock and people under stress from poor diet, higher susceptibility to disease, and a greater risk of death due to malnutrition, dehydration, and poor immunity.

In the market place, livestock prices will decline and then collapse – initially due to the poor condition of livestock, and later due to the market being flooded with animals in poor condition. For pastoralists this means they must sell more animals to purchase the same amount of grain or other products, resulting in unfavourable terms of trade.

Pastoralists have a number of different strategies to respond to drought conditions:

- Being mobile. Sometimes the whole family will move with the animals, at other times not. Those that remain, often the women, children, elderly, and sick or infirm will move to a nearby town.
- Looking for alternative sources of income through petty trade, manual labour or migration to towns and cities.
- Selling livestock to purchase food (in spite of the poor terms of trade).

- Splitting their herds, keeping milking cows and weakened stock at the homestead close to water, and feeding them with supplementary fodder wherever possible.
- Loaning animal 'surplus' to subsistence requirements to family and friends to help them rebuild their herds and develop social relations as a form of social capital as a hedge against drought and other risks. This also allows families to maintain a functional balance between herd and family size.
- Slaughtering calves to reduce the stress on their dams.
- Rebuilidng the cattle herd by raising and selling small stock
- Gathering wild produce (such as berries, fruits and leaves to supplement their diet or selling them at market).
- Negotiating access to private ranches and farms where the animals can graze on crop residues, and in return provide manure and improve soil fertility.

These responses are in contrast to advice often given to pastoralists to sell their animals before prices collapse during a drought, as well as to stay in one place to facilitate the delivery of food aid, medicine, tents and blankets. However, there are a number of factors that make it **difficult for pastoralists to sell their animals before or during drought.**

Drought only occurs some time after the end of the dry season – i.e. when rains fails to arrive for one or more rainy season. While forecasters are getting better at predicting drought, such predictions still only occur some months or weeks before the rains are due – i.e. during or towards the end of the dry season. It is common for livestock to lose weight during the dry season, and many breeds found in pastoral areas are well adapted to put on weight very quickly once pasture becomes available again (compensatory growth). Since livestock have already lost weight by this time, when a drought hits, pastoralists are already facing poor terms of trade. It may make sense for a livestock owner to sell animals that are already in a very weak condition and likely to die, but such an animal may not be able to make the journey to reach a market, reducing its value still further. An animal that looks strong enough to survive a few more weeks would quickly regain weight and condition once rains begin. As a result, pastoralists prefer to 'hang on' to their animals and try and keep them alive (particularly young breeding stock), as these animals will reproduce quickly and allow them to rebuild their herd after the drought. **Pastoralists who manage to save as**

many animals as they can during the drought are in a stronger economic position than those who have few animals.

Once the rains come, pastoralists know it quickly becomes prohibitively expensive to purchase livestock at the market, particularly in the case of fertile female animals, due to high demand and improved condition. Those pastoralists that have sold all or most of their animals will be very poor and will find it difficult to afford to buy such animals from the market. Furthermore, the livestock available in the market are unknown and likely to be those animals that have been sold off first –known to be poor milk producers, low fertility, or to have suffered disease.

Thus, pastoralists who follow the advice of selling animals are at high risk of being stuck in a 'poverty trap', unable to buy replacement animals and with a herd too small to support the family. Complex ownership and use rights, and the age structure and sex-ratio of herds are additional factors that may make it difficult for pastoralists to sell animals before or during drought.

Those who have kept enough animals alive, on the other hand, will enjoy favourable terms of trade at the market and have a herd that can quickly multiply and grow due to the observed peak in fertility following drought. During drought years, it is thus critical to save the herd's core breeding animals. Families that are unable to retain their core breeding stock are effectively pushed out of the pastoral system and must find alternative livelihoods.

Box 4.7 Livestock marketing and drought

Pastoralists have sound economic reasons not to sell their livestock immediately, particularly when drought is very severe, as many pastoralists lose many animals and can become destitute. This is a social and economic tragedy, and needs to be addressed.

Drought responses that seek to help pastoralists preserve their breeding stock are more effective than conventional drought response mechanisms based on delivery of food aid. Food aid benefits the poorest, but providing animal feed, veterinary inputs and destocking helps recovery and rebuilding the herd post-drought (Abebe et al. 2008). Commercial destocking (often supported with loans to traders from development agencies) involves offering a fair price to pastoralists to buy livestock during drought, often facilitating purchases further from markets than traders would normally reach, and purchasing more livestock than would otherwise be bought (Morton 2013). The reduction in livestock numbers increases the chances of survival for the remaining animals and provides much needed cash to buy grains, veterinary supplies and livestock feed (Abebe et al. 2008).

There are strong economic reasons to explain why pastoralists do not sell all their animals when a drought starts. It makes good sense for them instead to move in search of pasture, as those pastoralists who manage to save as many animals as they can during the drought are in a stronger economic position than those who have few animals. They can sell a few animals at a high price to buy relatively cheap cereals thus reducing the pressure of the family to rely on the herd (for milk, sales, etc.).

Box 4.8 Key points – herd dynamics and herd growth

- The natural growth rate of a pastoral herd is slow. In the long run, there are many constraints – environmental, nutritional, health and human-related – that affect the rate at which a herd can grow.
- BUT the major consistent factor limiting herd growth in the drylands of Ethiopia is highly variable nutritional quality of natural pastures.
- There are strong economic reasons to explain why pastoralists do not sell all their animals at the start of a drought – the main reason is the need to save the core breeding stock in order to be able to rebuild herds when the rains return.
- Conventional drought response mechanisms based on delivery of food aid are less effective than those seeking to help pastoralists preserve their breeding stock.

4.4 Mobility as a management tool

Mobility is a very important strategy used by pastoralists to respond to the variability, unpredictability and dispersed nature of pastoral resources (IIED/SOS Sahel 2009; Niamir-Fuller 1999). It is thus important to understand how it works and how it affects different members of the family in different ways.

Non-pastoralists often classify mobility among pastoralists by the degree or extent of the movement:

Nomadic/nomadism: to describe very extensive mobility over great distances and many years. Nomadism also implies that the entire family moves with the herd, and the family practices pastoralism uniquely. Nomadism is also said to be mainly found in very arid regions, where forage resources are patchy and highly irregular from year to year.

Transhumant/transhumance: to describe the more regular movement of herds between well-defined wet and dry season pastures in order to exploit the seasonal availability of pastures. Transhumance may be horizontal – for example moving from north to south following rainfall variations – or vertical – for example moving higher in elevation.

Pastoralists, however, describe mobility differently. Mobility is defined according to its **objective** (and not its extent) and pastoralists have a very large and detailed vocabulary to describe specific types of movements.

There are four main reasons why pastoralists are mobile:

1. To maintain high livestock productivity

Mobility is critical to access the most NUTRITIOUS pastures in different geographical or ecological areas within and between seasons. While livestock mobility is increasingly recognised to be important in the drylands, many people think it is driven by pasture scarcity – i.e. pastoralists move to areas of new pasture when the area in which they are grazing their animals runs out of pasture. However, mobility is a strategy used throughout the year:

- ✓ At the very beginning of the rainy season: The first rains after the long dry season are very scattered. This is therefore a moment of great mobility as pastoralists move quickly to lead their animals to the fresh new grass that has not yet been trampled or eaten by other livestock. Animals are weak after the long dry season, and pastoralists want them to put on weight as soon as possible. When these early rains come, livestock do not want to eat the dry biomass any more. They can `smell' the fresh grass, which is more nutritious.

- ✓ Throughout the rainy season. At this moment there is plenty of pasture, but livestock are constantly on the move to find the best quality pastures that are available and to avoid those areas that become over-congested or where pastures have been trampled or soiled by other animals. They also move to find other resources such as salt, or to avoid wildlife (e.g. during the calving of wildebeest when there is a high risk of Malignant Catarrhal Fever).

- ✓ Throughout the dry season. Here mobility is often more constrained and limited by pastoralists' access to a permanent water source. So long as there is available pasture and water, livestock will move on a fairly regular basis between the water source and the available pastures. Occasionally, if pastures run out and/or the water source dries up or breaks down, there will be exceptional movements to find another permanent water point with available pasture.

In some pastoral systems (e.g. the Baggara of Sudan) dry season movements can be very extensive, enabling livestock to access fresh pastures from specific ecological niches, when all around the rangelands are dry. In other systems, mobility is limited within years to a few hundred square kilometers, but may extend considerably further during drought periods, as happened in 2009 when Maasai in Laikipia negotiated access to graze on crop residues among the Kikuyu and Meru communities living near Mount Kenya (Letai and Lind 2013).

2. To avoid problems to their livelihoods

Such shocks include disease, insecurity, wildlife or periodic droughts or floods. It may not be possible to predict where and when they will occur, but such shocks are a characteristic of pastoralist areas and responding to them is a part and parcel of their management system.

3. To access markets within and between countries

Markets are very important to pastoralists; they are where they sell livestock and other animal products, where they purchase food and other items, and where they share and collect information. Markets are often far from the rangelands, requiring long treks. The advent of mobile phones now allows pastoralists to get information about livestock prices at markets around the country, and across borders. Maintaining clear livestock routes between major markets and grazing areas allows livestock to maintain their condition and weight, getting better prices from traders.

4. For social and cultural reasons

Families, clans, and individuals traditionally maintain reciprocal arrangements through marriages, baptisms, festivals, etc. These arrangements are an important part of negotiating access to pasture and water at times of need and are therefore an integral part of the management of pastoral systems.

Mobility has particular implications for women in pastoralist societies, who may take on different roles or experience greater workloads:

- Greater responsibility for looking after livestock – when men go away with the larger herd, women are responsible for looking after the remaining animals. They have to do this in addition to their usual duties.
- Greater insecurity for women remaining at the homestead to protect their herd and their remaining family.
- Greater responsibility for looking after the welfare of the family that remains. Such as in finding food and looking after the sick.
- Women whose husbands have gone away play a greater role in family and even community-level decision-making processes – e.g. negotiations with outsiders seeking access to the community's water and pasture resources.

4.4.1 Constraints to mobility

Pastoralists are currently facing a number of constraints to their mobility, which are blocking grazing routes and promoting pastoral sedetarisation (Fernandez-Gimenez and Le Febre 2006; IIED/SOS Sahel 2009). These include:

- Conversion of rangeland to alternative land uses (Box 4.9).
- Establishment and enforcement of political and administrative boundaries.
- Fencing.
- Insecurity and conflict.
- Increased labour costs.
- Development of stationary goods and services such as waterholes, schools and medical facilities.
- Social change.

Box 4.9 Changes in land use that reduce livestock mobility: These include:

- For cultivation, including irrigation schemes.
- Conservation uses such as National Parks: e.g. Awash National Park.
- Animal holding centres: e.g. Alledeghi holding centre.
- Settlements – including new settlements and extension of old settlements due to increasing population and demands for agricultural smallholdings.

These constraints have consequences for pastoralists, the environment and pastoralism, many of which have been introduced in Chapter 3. These include:

- Reduced livestock productivity: in the drylands, mobile livestock are more productive than sedentary livestock (see example the case study in Box 4.10).
- Overgrazing and soil erosion.
- Reduced soil fertility where animals no longer graze on crop residues; salinity in the case of irrigation.
- Increases in the prevalence of both human and livestock diseases, as populations are constrained to settlements and livestock are unable to leave areas during tick infestations or disease outbreak.
- Increase in conflict due to increased competition for resources.

Box 4.10 How does mobility impact on the productivity of livestock? (Wilson & Clarke 1976; Behnke 1985)

In 1973, two animal scientists working for the Minister of Agriculture, Democratic Republic of the Sudan, conducted research over 14 months to investigate the impact of mobility on productivity. The researchers studied seven cattle herds, four that were mobile (546 animals), and three that were sedentary (149 animals). At the beginning of the study all the animals in the seven herds were tagged, weighed, and their history collected from the owners. Over the year, the adult cattle were weighed four times, while calves were weighed more frequently at 6 to 8 week intervals. The results are in the table below.

Productivity of sedentary and mobile livestock in southern Darfur

7 herds: 3 sedentary and 4 mobile	Sedentary (149)	Mobile (546)
Meat production per kg of breeding female	0.023 kg	0.057 kg
Calving rate	45%	65%
Total deaths	35%	15%
Calf deaths	40%	11%

The mobile livestock belonged to a group of pastoralists called the Baggara, while the sedentary livestock belong to a group of agro-pastoralists living near the town of Nyala in the northern part of Darfur.

At the start of the rainy season the Baggara are in the south in their 'home area' - it is a swampy area during the rainy season. When the rains come, they and their livestock are driven out by the mud and biting flies, but they also follow the rains that in the Sahel move along a south-north axis. By following the rains, the animals are able to eat the fresh green grass, high in nutrients.

The Baggara spend the wet season in the north benefiting from the fresh pastures, but once the rains stop and the northern pastures begin to dry out and lose their quality, they start to move south following seasonal rivers. Here their animals benefit from the fresh growth that is sprouting as the waters recede.

The Baggara slowly follow these riverine pastures until they reach their home areas where they burn the existing vegetation to get more fresh pasture.

In contrast, the agro-pastoral livestock that stay in the north all year long only benefit from nutritious pastures in the rainy season. For the rest of the year they have to feed on poorer quality pastures and this explains why they are less productive than the mobile livestock who feed on highly nutritious pasture throughout the year.

Box 4.11 Key points – pastoral mobility

- Pastoral mobility has four key objectives:
  - To maximise productivity
  - To access markets
  - To avoid danger, threats and shocks
  - To participate in social and cultural events.
- Mobility is difficult but carefully planned; it is not haphazard.
- Mobility impacts on men, women and children in different ways.
- Mobile livestock are more productive than sedentary livestock under dryland conditions of variable resources.
- Livestock mobility today is seriously constrained resulting in:
  - Lower livestock productivity
  - Increased environmental degradation
  - Conflict

References and further reading

Abebe, D., Cullis, A., Catley, A., Aklilu, Y., Mekonnen, G., and Ghebrechirstos, Y. 2008. Impact of a commercial destocking relief intervention in Moyale district, southern Ethiopia. Disasters, 32(2), 167-189. www.disasterriskreduction.net/fileadmin/user_upload/drought/docs/Abebe%20et%20al%20Destocking%20paper.pdf

Abegaz, S., Tiyo, D. and Gizachew, L. 1996. Compensatory growth in Horro lambs of Ethiopia. In Proceedings of the Third Biennial Conference of the African Small Ruminant Research Network UICC, Kampala, Uganda. www.fao.org/wairdocs/ilri/x5473b/x5473b1p.htm#compensatory growth in horro lambs of ethiopia.

Angassa, A., and Beyene, F. 2003. Current range condition in southern Ethiopia in relation to traditional management strategies: the perceptions of Borana pastoralists. Tropical Grasslands, 37(1), 53-59. www.tropicalgrasslands.info/public/journals/4/Historic/Tropical%20Grasslands%20Journal%20archive/PDFs/Vol_37_2003/Vol_37_01_03_pp53_59.pdf

Behnke, R.H. 1985a. Open-range management and property rights in pastoral Africa: a case of spontaneous range enclosure in South Darfur, Sudan. ODI Pastoral Development Network Paper 20f.

Behnke, R.H. 1985b. Measuring the benefits of subsistence versus commercial livestock production in Africa. Agricultural Systems Vol 18, 2, p. 109-135.

Cossins, N.J. 1884. The productivity and potential of pastoral systems. Ethiopian Rangelands Programme, ILCA,P.O. Box 5689, Addis Ababa, Ethiopia.

Dahl, G., and Hjort, A. 1976. Having herds: pastoral herd growth and household economy. Department of Social Anthropology, University of Stockholm.

de Leeuw, P.N., Semenye, P.P., Peacock, C.P., Grandin, B.E., 1991. Productivity of cattle and smallstock. In: Bekure, S., de Leeuw, P.N., Grandin, B.E., Neate, P.J.H. (Eds.), Maasai herding: an analysis of the livestock production system of Maasai pastoralists in eastern Kajiado District, Kenya. ILCA Systems Study 4. ILCA (International Livestock Centre for Africa), Addis Ababa, pp. 83–100.

Fernandez-Gimenez, M.E., and Le Febre, S. 2006. Mobility in pastoral systems: Dynamic flux or downward trend? The International Journal of Sustainable Development and World Ecology, 13(5), 341-362.

FIC & IIED. 2013. Pastoralism and pastoral policy in Ethiopia. Facilitators manual Module 1. Feinstein International Centre, Tufts University and International Institute for Environment and Development.

IIED & SOS Sahel 2009. Modern and mobile. The future of livestock production in Africa's drylands. Edited by de Jode, H. http://pubs.iied.org/12565IIED.html

Krätli, S. 2015. Valuing variability: New perspectives on climate resilient drylands development. IIED: London. Edited by de Jode, H. http://pubs.iied.org/10128IIED.html

Krätli S. and Schareika N. 2010. Living off Uncertainty. The Intelligent Animal Production of Dryland Pastoralists. European Journal of Development Research 22(5): 605-622.

Letai, J. and Lind, J. 2013. Squeezed from all sides: changing resource tenure and pastoral innovation on the Laikipia Plateau, Kenya. In: Andy Catley, Jeremy Lind, and Ian Scoones (eds.), Pastoralism and Development in Africa: dynamic change at the margins. Abingdon and New York: Routledge.

Mace, R. 1990. Pastoralist herd compositions in unpredictable environments: a comparison of model predictions and data from camel-keeping groups. Agricultural Systems, 33(1), 1-11.

Morton, J. 2013. Responsible companies and African livestock-keepers: Helping, teaching but not learning? In: Catley, Andy, Lind, Jeremy and Scoones, Ian, (eds.) Pastoralism and Development in Africa: Dynamic Change at the Margins. Routledge, Abingdon, UK.

Niamir-Fuller, M. 1999. Managing mobility in African rangelands. pp 102–132. In McCarthy, N., B. Swallow, M. Kirk, and P. Hazell, editors. Property rights, risk, and livestock development in Africa. International Food Policy Research Institute and International Livestock Research Institute. Washington, D.C., USA.
www.ilri.org/InfoServ/Webpub/fulldocs/PropertyRights/Chapter7.htm#TopOfPage

Njuki, J., and Sanginga, P.C. 2013. Women, livestock ownership and markets: bridging the gender gap in Eastern and Southern Africa. London: Routledge.

Oba, G., and Lusigi, W.J. 1987. An overview of drought strategies and land use in African pastoral systems. Overseas Development Institute Agricultural Administration Unit.
www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/5285.pdf

Wilson, R.T. and Clarke, S.E. 1976. Studies of the livestock of southern Darfur, Sudan II: Production traits in cattle. Tropical Animal Health and Production. 8: 51-57.

5. Social and cultural institutions in pastoral societies

Summary

The first half of this chapter looks at what makes up a pastoral family, how it relates to the herd, and the labour demands of pastoralism:

- The pastoral family, which exists within a broader social, cultural and political context, consists of those, whether related or not, who are directly involved in the day-to-day management of the herd, on which they depend for the greater part of their livelihood.

- Family members are involved in a number of different activities depending on their age and gender:

➢ Productive activities involve looking after the livestock, such as herding, milking and other economic activities.These are built on knowledge and skill, and are partitioned depending on the nature of the task, but these activities usually involve all members of the family, girls and boys, men and women.
➢ Reproductive activities are those related to the health, growth and well-being of the family, including cooking, fetching and child care. Women tend to be responsible for these activities
➢ Community activities are those such as participating in cultural meetings, ceremonies, and decision-making at community and local government levels, often over access to, or use, of pastoral resources. These involve both men and women, depending on the issues in discussion.
➢ Some of these activities are daily, while others are seasonal or occasional.

- Customary pastoral institutions are made up of social bonds of mutual assistance, exchange, obligations and reciprocity within and between families, and constitute the social and cultural fabric of communities.

- Today, pastoral institutions are a combination of both customary institutions and modern institutions established by government and development agencies.

- Pastoral insitutions regulate natural resource use through reciprocated, negotiated access and authority, thereby preventing a 'tragedy of the commons'.

The second half of the chapter looks specifically at conflict in pastoral areas and the role of customary and modern institutions in conflict creation and mitigation:

- Some pastoral areas are characterised by high levels of insecurity of conflict, especially in border areas, although conflict is not necessarily inherent to pastoral society.

- As traditional institutions break down and lose authority, and government institutions are either absent or ineffective, conflict can result over access to, and control over, important resources. In many pastoral areas, the use of guns and other weaponry is escalating, with violent consequences.

- Conflict has far reaching impacts and can result in injury and death to people, as well as loss of livestock, reduced mobility, food insecurity, and closure of markets, schools and health services, all posing a signficant threat to pastoral livelihoods.

- Effective conflict mitgation must be diverse and occur at the local, national and international levels. Policy and advocacy play an important role in mitigating conflict in pastoral areas, and must address the underlying causes of conflict.

Brainstorming questions

1) What are some of the challenges and opportunities that might arise when trying to reconcile customary and modern institutions in governing resource use?

2) What sort of institutions (both customary and modern) might be part of an approach for conflict resolution and management in a pastoral setting. Think of examples of successful conflict management in a real situation.

5.1 The pastoral family and institutions

'A family' means different things from one pastoral society to another in Ethiopia and elsewhere. In some societies there are extended families with married sons living together with their father, and where all the livestock are kept together as one management unit. In other societies, sons leave their father's home as soon as they marry, and take their livestock to set up their own family.

Families are also dynamic – family members grow and become adult men and women, aunts and uncles, grandparents. Education, employment in towns and cities, and poverty are changing the economic and social roles of men and women within pastoral societies. Members of a family may leave the homestead and seek employment elsewhere, sometimes permanently due to a major crisis such as the loss of the livestock herd, sometimes seasonally to alleviate demands for food during the dry season.

Families also exist within broader social, cultural and political contexts. Families belong to clans or sub-clans, which may also belong to tribes. These wider social groupings provide the framework within which culture and social identity are expressed and reproduced. They also provide the framework within which certain economic activities are organised and implemented, for example, in managing land and natural resources, resolving conflict, and managing mobility.

Box 5.1 illustrates the social relations amongst the Borana pastoralist society. A territorially-based hierachy of households, extended families, villages, neighbourhoods is cross-cut with a lineal system of clans. Although the household is the basic unit of production and consumption, lineages and clans help in times of hardship and provide a wider network of mutual assistance. Even more broadly, pastoral people within the family are also members of the modern state, with legal rights and responsibilities. They belong to political parties, civil society organisations, religious organisations, etc.
In this book, the family refers to:

All those people (men and women, old and young) [who may or may not be related by blood] who are directly involved in the day-to-day management of the herd, on which they are dependent for the greater part of their livelihood.

Box 5.1 Borana society structure

The organisational structure of Boran society is territorial as well as lineal. The territorially based hierarchy starts with the smallest unit, the hearth (ibidda) with one male household head, his wife or wives and children. This is followed by warra - the fundamental component of production - which comprises members of the extended family who live and eat with the herd owner's family. The warra exists within encampments or villages (ollaa), neighbourhoods containing encampments (madda), and regional associations of neighbourhoods (dheeda).

Although the household (warra) is the basic unit of production and consumption, some types of work are carried out cooperatively. These labour-sharing activities include herding, watering animals, marketing dairy products, and constructing corrals and fences. Additionally, benefits in terms of social activities, group security and information sharing play a vital role in the development of encampments.

Cross-cutting the territorially-based hierarchy are the mana (lineage) and gosa (clans) which broadly nests clans within sub-moieties and moieties. In the Boran social system descent is recognised only through the male line and men and women descended from a common ancestor constitute a corporate group in that they share many collective rights and obligations. Men who head the warra are called Abba Warra or father of the household and make strategic decisions regarding livestock production and sales. The father of the encampment (or Abba Ollaa), who is selected from among the Abba Warra, is a respected individual who provides leadership to other members of the ollaa.

Lineages (mana) are the basic components of the descent system and determine roles in ritual, water management and wealth distribution. On the other hand, gosa are groups of lineages that share a common male ancestor. Clan members are expected to help each other in times of hardship in addition to providing a wider network of mutual assistance than individual lineage. Members of clans reportedly settle their disputes amicably at clan meetings (kora gosaa) in which clan elders (jaarsa gosaa) use moral authority to settle disagreements, through imposing fines on wrongdoers and seizing property. Additionally, they have roles in ritual, maintenance and regulation of water resources and the redistribution of wealth among the pastoralists.

Finally, in Boran society there are two moieties (Sabboo and Goona) that represent the highest social division. Members of one moiety can only marry into the opposite moiety, and moieties are approximately equal in population size. The source of social justice in the system is the balance of power between Sabboo and Goona that permeate all aspects of collective decision-making. Moieties play a prominent role in the election of Gada councillors. The heads of the two moieties are called qaallu, who have ritual leadership duties, responsible for organising the election of Gada leaders, and act as the ultimate adjudicators of major conflicts. Gada leaders are elected at the Gumi Gayo assembly held in Djire every eight years. The clan leaders are known as jallaba and have the responsibility to attend the clan meetings, besides playing other roles in the Gada system representing the clan.

5.1.1 Labour management and gender roles in pastoral societies

Pastoral work is hard and difficult. Within the system there exists a strong division of labour, which consistently challenges the family to find the right balance between the size of the herd and the number of people it has to support. Beyond the management and maintenance of the livestock herd, different members of the family will be involved in alternative income generating activities – small-scale marketing of tea and sugar, herding, agriculture – not to mention the day-to-day management of the family and homestead – collecting water and firewood.

Figure 5.1 Herding small stock and resident cattle tends to be the responsibility of younger children and women.

When considering different customary roles within pastoral families, men and women, girls and boys, it is useful to categorise pastoral activities into three types:

- Productive activities: looking after livestock and other economic activities.
- Reproductive activities: cooking, fetching, childcare, health care, etc.
- Community activities: participating in cultural meetings, ceremonies, decision-making at community/local government levels, etc.

Productive activities

Productive activities are those which relate to the economic well-being of the household. Both women and men are involved in productive activities. In many cases, they do the same type of activity, but are responsible for different aspects: e.g. different species of animals or ages of animals.

- Productive activities can be daily activities such as milking and herding the animals, seasonal activities such as digging wells, or occasional activities such as repairing equipment or the family home. Daily activities may require very different time commitments depending on the season, as well as the status of the family. Seasonal `bottlenecks' occur when labour demands on all members of the family are high. The availability of labour during such bottlenecks can act as a limiting factor in the growth of the herd. Table 5.1 below shows how the time requirements for the different activities undertaken by Boran women in Dubluk Madda vary by season.

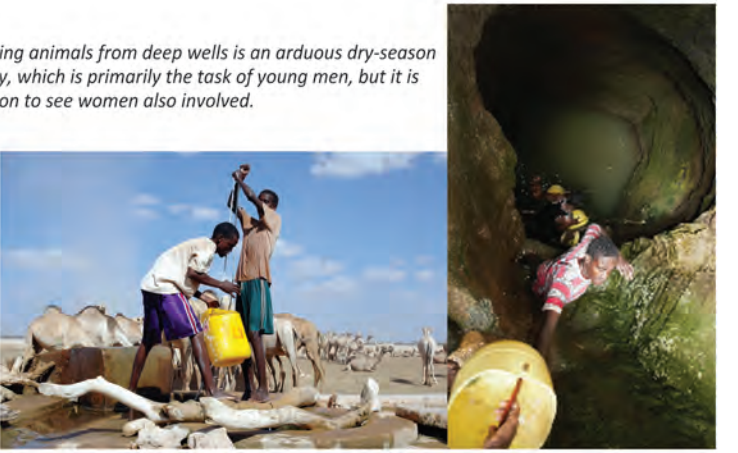
- Many productive activities require knowledge and skills, which have built up over time and are passed on from generation to another – e.g. the selection of which animals from which to breed, veterinary care, harvesting and processing wild foods and medicines.

- Productive activities are organised and implemented at different levels (individual, family and sub-clan or clan) depending on the nature of the task, the value of capturing economies of scale and dealing with such external issues as insecurity.

Among the Borana, herding involves girls and boys, and young men and women from 6 to 25 years of age. Younger boys and girls and women in general are engaged in doing most of the caring for small stock and warra (resident cattle) as well as foora herding (herding close to the homestead).

Figure 5.2 Older boys are responsible for cattle, particularly when moving to distant pastures during the rainy season or drought, or transporting cattle to market.

Figure 5.3 Watering animals from deep wells is an arduous dry-season activity, which is primarily the task of young men, but it is common to see women also involved.



While marketing of cattle and camels tends to be the responsibility of adult men, women are also very active in the markets. They are often responsible for selling small stock, livestock products (such as milk and butter), and other goods often collected from the forests – herbs, fruits. Women play a major role in deciding how much milk can be sold versus consumed within the household or left to the calf, and in monitoring livestock health, calf mortality and the herd's potential for growth.

Reproductive activities

Reproductive activities are those that relate to the health, growth, and well-being of the family: cooking, fetching, childcare, health care, etc. Women alone tend to be responsible for reproductive activities.

- Many reproductive activities tend to be daily activities. Many involve hard physical work that continues at a high level all year, but particularly in the dry season.

- Some activities require knowledge and skills such as collecting and processing bush products for food, knowing where to find such food in the ecosystem, understanding the dynamics of such products (when they are edible, when they might be poisonous, etc.).
- Activities, workloads, obligations and rights also vary according to the age of women. For example, girls will work for their mother, young wives will help their mother-in-laws, mothers and mother-in-laws will be helped by their daughters and daughter-in-laws, grandmothers will supervise and organise.

Community activities

Both men and women are involved in and have responsibility for community activities. In some cases, they do the same type of activity (e.g. organising ceremonies), but have different responsibilities (e.g. men are responsible for men's issues, women are responsible for women's activities).

Just as there are different roles in specific activities such as herding and milking, there are different roles in decision-making. For example, decisions such as when to move may be the responsibility of men, but once the decision is made, the women are closely involved in how to move.

It is often assumed that men are the decision makers in pastoral families. There is evidence that the role of men as representatives of pastoral (as well as agricultural) communities was elevated during the colonial period (Hodgson 2001). Colonial officers, exclusively men, would meet exclusively with male members of local communities. In this way, the information gathered, and any consultations, excluded women and their experiences. In European societies at the time, it would have been unheard of for women to own livestock or be involved in livestock management decisions, and this assumption carried over to the colonies, in the process cementing men's roles as community representatives and deepening their economic and political power.

Figure 5.4 Women are important players in managing seasonal movements of settlements.

- Community activities involve more strategic issues both within pastoral communities, and between them and the wider society, including local and national government, and other groups such as farmers. These activities have a direct impact on both productive and reproductive activities.

- Men's responsibilities include dialogue with external actors such as local government, and other user groups, such as farmers, leaders of projects and NGOs.

- Some productive activities also require community-level involvement – for example maintaining a deep well, or security when moving from one area to another. Women also work together to coordinate and facilitate marketing activities or in fence construction.

Table 5.1 Total hours per week for various activities of Boran women in Dubluk Madda (FIC & IIED 2013)

Activities of women	Long rainy season		Warm dry season	
	Total hrs/week	%	Total hrs/week	%
Productive				
Milking	14.12	18.8	5.63	5.2
Marketing	6.71	8.9	10.36	9.6
Corral cleaning	2.90	3.9	1.18	1.0
Cultivation	2.95	3.9	-	-
Collect bush wood	0.82	1.1	-	-
Herding cattle	0.08	0.1	0.37	0.3
Watering calves	0.06	0.08	6.58	6.1
Corral construction	0.12	0.1	-	-
Fence construction	0.06	0.08	-	-
Corral repair	-	-	0.01	<0.01
Calf hut construction	-	-	1.59	1.5
Watering cattle	-	-	9.59	8.9
Forage collection	-	-	14.13	13.1
Pond repair	-	-	4.82	4.4
Well work	-	-	2.80	2.6
Kalo repair	-	-	0.07	0.06
Reproductive				
Fuel-wood collection	21.22	28.3	10.24	9.5
Milk churning	10.81	14.4	0.53	0.5
Food preparation	8.75	11.7	16.68	15.4
Weaving milk container	2.64	3.5	0.90	0.8
Fetching water	3.63	4.8	22.73	21.0
Total hours per week Daily average	74.87 10.7		108.21 15.5	

Livelihood and diet diversification

Contrary to what many think, the pastoral family cannot live off milk alone, and diets in pastoral areas are diversifying, just as they are in many other parts of East Africa. Diversification requires additional skills as well as placing additional labour demands on the family. The growing of food crops has always been a part of some pastoral systems in Ethiopia. Some groups (Karamojong, Dassenech, Afambo Afar) are agro-pastoralists where farming and pastoralism are integral features of their livelihood systems. In other groups, such as the Somali or Borana, poor families who have lost their animals to drought, disease or raiding and can no longer survive off the remaining animals, often practice crop cultivation, in some cases abandoning it (for longer or shorter periods) if their herd sizes and compositions enable them to fully support the family.

Table 5.2 below shows the results of a study in Shinile in the Somali Region of Ethiopia, that investigated the importance of different food types in the diets of pastoralists and agro-pastoralists. While a common perception of pastoralists is of a people that live off milk, blood and meat alone, these results tell a different story. For pastoralists, a diverse diet, as well as other cash needs for education, medicine, clothes, mobile phones and other commodities makes involvement in markets an essential part of life. Evangelou (1984) estimates the rate of livestock off-take from pastoral herds in Kenya at ten per cent per year – sold and exchanged within the informal as well as formal sector.

Table 5.2 The importance of different food types in the diets of pastoralists and agro-pastoralists, Shinile Region, Ethiopia (Devereux 2006)

	Pastoralists	Agro-pastoralists
1. Cereals	%	%
Maize	72	61
Wheat	61	61
Sorghum	49	58
Rice	32	7
Pasta	18	1
Bread	9	1
Barley	0	1
2.Meat, fish & dairy		
Milk	93	91
Meat	76	55
Eggs	6	0
Fish	1	0
3. Vegetables		
Beans	8	9
Vegetables	8	1
Fruits	2	0

Box 5.2 Key points – labour demands in pastoralism

- Pastoral labour is hard, difficult, and often demands a great deal of knowledge and skill.
- Some activities are daily, while others are seasonal or occasional.
- Women tend to play a greater role than men in reproductive activities: water collection, firewood collection, food preparation,etc.
- Activities are carefully organised and divided by age and gender and organised at different levels (individual, family, clan).
- Pastoral men and women work closely together to ensure the health and well-being of both the herd and the family.

5.1.2 Social capital, mutual assistance and indigenous social institutions

In Chapter 4, we saw that livestock ownership plays an important role in determining livestock management – limiting an individual herder's decisions over which animals may be sold, and sometimes where livestock can be grazed. Pastoral societies have long used a complex system of livestock exchange and inheritance to spread risk, create social capital within and between families, and ensure the long-term survival of the herd.

The importance of multiple types of ownership and the rights attributed to individuals over specific animals can be seen in the number of names in local languages attributed to them (see Table 5.3 for an example among the Maasai in Tanzania). By gifting or loaning livestock, individuals and families create social bonds of obligation towards each other. These obligations extend to all aspects of pastoral life – from grazing and watering rights and responsibilities, to providing a safety net during times of extreme stress, drought or disease.

Table 5.3 Maasai names attributed to livestock according to ownership rights (FIC & IIED 2013)

Maasai	English	Rights of ownership and use
Engiteng Lepa	Milking cow	An owner of a milk cow gives it to a relative or friend for a specified length of time. The friend/relative has milk rights only.
Ngishu-ooloikop	Cattle payment given to family who lost the person	A clan/family gives cattle as compensation to another clan/family who have lost a person. They have total ownership rights.
Ewoloto	Restocking	A family member/clan with more animals loans/gives animals to a person/family member with less or without animals. The recipient has all rights but cannot sell for a specified period.
Engiteng emisigiyoi	Herd given at birth	A father allocates animals to his children at birth. These represent the nucleus of their herd. They acquire full rights when they get to adulthood/marry.
Ngishu engaputi	Dowry cows	Those animals given to men by their son-in-law and family. The wife has milk rights.
Ngishu naitaaro	Non-pastoralist	These are animals entrusted to pastoralists by strangers. The pastoralist has milk rights and can eat the meat if it dies BUT has to return the skin to the owner.

Social capital and mutual assistance are key elements of customary institutions binding pastoral communities. Customary institutions may be kinship-based or geographically-based, and vary in strength. "Kinship institutions continue to provide the only even partly most reliable safety nets for destitute pastoralists through clan-based livestock redistribution, despite several decades of persistent government and donor attempts to deny them legitimacy" (Swift 1995. p. 158). Broader customary institutions vary in their strength and capacity from place to place and community to community, and in all cases must co-exist with modern institutions established by government and development agencies. Pastoral institutons today are thus a combination of customary and modern.

A key role of institutions, customary or modern, in pastoral areas, is to regulate natural resource use, through reciprocated, negotiated access and authority. One of the most common misperceptions of pastoralism is the assumption that pastoralists sharing a common resource do not regulate their resource use and will act in their self-interest to utilise a greater proportion of that resource. This is known as the 'tragedy of the commons' and has misinformed government policy towards the privatisation of common resources (Hardin 1968) (see also Chapter 7).

A 'tragedy of the commons' is more relevant to open access resources, where unregulated access to the resource can lead to degradation, conflict and poverty. Over-fishing in the world's oceans and polluting the atmosphere with high carbon emissions that is driving today's climate change are two examples of a 'tragedy of the commons'. In contrast, access and use of pastoral resources is regulated and negotiated by pastoralists who have developed self-governing institutions to successfully manage and regulate common resources amongst users (Ostrom 1990).

Within pastoral societies, where pastoral resources (pastures, water, minerals) are highly variable and unpredictable in time and space, and in terms of quantity and quality, access must always be negotiated and reciprocal. In this way, pastoral families are able to manage the risk of variability by ensuring access over a very wide area.

Pastoralists have developed complex mechanisms and institutions that govern mobility, resource use and access, that allow pastoralists to make effective use of their variable environments (WISP 2007). These institutionalised practices include setting aside pastures, preserving water resources, protecting trees, and ensuring pasture self-seeds before it is grazed. Rules and institutions are enforced, and sanctions can be applied to those who break the rules.

Mobility is the single most important strategy employed by pastoralists in response to the variability in their environment and to maximise productivity.

Transaction costs are high, and negotiated access to pasture and water is a day-to-day essential reality of pastoralism. Unregulated access to water and pastures can lead to overcrowded pastures, rangeland degradation, decline in productivity, conflict and poverty (and thus a `tragedy of the commons').

Changing nature of social dynamics within pastoralists

Today, changing societal dynamics are eroding the traditional insitutions in pastoral areas. The roles and responsibilities of men and women, and youth and elders are changing. Some of these changes are negative as a result of families losing their livestock and having to diversify into alternative livelihoods, some of which negatively affect pastoralism (e.g. charcoal, crop irrigation in dry season rangelands). The greater monetisation of the pastoral economy and formal education are changing relations within families (men, women and the youth) and between families (greater wealth differentiation). Other changes are more positive, with pastoralists seizing opportunities offered by new technology (e.g. mobile phones, mobile banking) and emerging regional markets for livestock products. Chapter 7 will look further at how policies have impacted on pastoralism, and Chapter 8 at some of the constraints and opportunties these changes are having on pastoralism.

5.2 Conflict in pastoral areas

Pastoral areas in Ethiopia, and in the region, are characterised by high levels of insecurity and conflict. In the Greater Horn of Africa conflict exists at the intersection of Kenya, Uganda, Sudan, Somalia and Ethiopia, as well as in areas in Northern Kenya and Northern Tanzania (Box 5.3). In this section, we consider the nature of pastoral conflict – where it is found, why it is so prevalent and some of the responses to conflict at the local and regional level.

Conflict describes a state of disharmony between two parties arising from opposing or incompatible needs, ideas or interests often accompanied with perception of threats to either party's interests, needs or concerns.

Conflict is not inherent to pastoral society, as is often believed. Conflict exists in all societies as a result of the failure of institutions and frameworks for managing and mediating access to and control over strategic resources (e.g. pastures, oil fields, dry season grazing and water points). In pastoral areas, traditional institutions responsible for managing conflict are losing their authority while formal government institutions such as the police, the army or the judiciary are either absent or ineffective. This is creating a `governance vacuum' at the local level, which is further exacerbated by the proliferation of small arms as a result of wider regional conflicts (e.g. civil wars). Institutions and mechanisms to resolve conflict are becoming ever more vital, and there are a number of ongoing initiatives at the local, national and intergovernmental levels (Box 5.3).

Box 5.3 Principal pastoral conflict clusters in the Greater Horn of Africa

Hotspots of pastoral conflict in the Greater Horn of Africa are at the intersection of Kenya, Uganda, Sudan, Somalia and Ethiopia. There are two principal clusters in addition to occasional flares of conflict in Northern Kenya and Northern Tanzania:

1. **Karamoja cluster (between and within Uganda, Kenya, Sudan and Ethiopia)**
   - Conflict between Karimojong clans in Uganda; between Karimojong and Turkana; between Karimojong and Pokot; between Pokot and Turkana; between Karimojong and Toposa; between Toposa and Turkana.

2. **Borana and Somali clusters (between and within Kenya, Ethiopia and Somalia)**
   - Conflict between Somalis and Afars; between the Isas and the Kareyu; between the Oromiya and the Afars.
3. **Other conflicts**
   - Sonjo and Maasai in Ngorongoro, northern Tanzania.
   - Samburu versus Borana in northern Kenya.
   - Borana versus Laikipiak Maasai in northern Kenya.

5.2.1 Causes and impacts of conflict in pastoral areas

Conflict in pastoral areas may be caused by factors internal to the communities themselves, by external factors that are a function of interactions between pastoralists and other external institutions and agencies, and by both internal and external factors. There are a number of factors contributing to the escalation of conflict in pastoral areas, including; the lack of appropriate and effective insitutions and policies governing land and resources, the weakening of traditional institutions, and the proliferation of small arms (Box 5.4).

Livestock raiding has a long tradition in pastoral culture, used as a way to restock herds following drought or disease, or for young men to establish their own herds. However, conflicts are becoming more frequent, violent and destructive and

accompanied by the use of modern weaponry (Hendrickson et al. 1998; Schilling et al. 2012). Conflicts over resources also exist between pastoralists and settled farmers (Hussein 1998) and with the state and private enterprise over land alienation and investments (Cotula et al. 2009) and due to conservation displacement (Dowie 2011).

Box 5.4 Causes of conflict in pastoral areas

Absence or ineffective institutional arrangements for managing access to and/or control over variable and unpredictable pastoral resources – water, pasture, salt-licks.

Absence or inappropriate policies and laws managing competing land uses – especially with conservation, agriculture, settlement, infrastructure.

Inappropriate development and natural resource management policies – non-recognition of pastoralism, constraining mobility, absence of support to pastoralists after drought (livestock raids to restock).

Weakening, marginalisation or collapse of traditional institutions of resource management and conflict resolution.

Intra-state crises of governance and insecurity in the Horn of Africa, including civil wars - Somalia, Sudan, Ethiopia, Eritrea.

Proliferation of small arms

Inadequate government machinery and infrastructure for law enforcement in pastoral areas.

Opportunism of political leaders in pastoral areas.

Banditry and terrorism

The impact of pastoral conflicts are felt by all members of society, directly and indirectly. Direct impacts on people include physical injury, mental trauma and death. Women and children are often particularly badly affected, for example rape and mutilation of women and girls are tactics of war; and through counter-insurgency, with child soldiers in South Sudan and Northern Uganda.

Direct impacts on infrastructure, such as schools or medical centres can have long-term indirect impacts on the provision of services, such as education, vaccination programmes, and veterinary services.

The effects of conflict can also be felt immediately, such as the direct and violent depletion of livestock or closure of markets. Some effects can also be felt much more broadly and over the longer term – a reduction in investment and trade interest in a region, the ongoing diversion of government resources from service provision to security, the breakdown of traditional safety nets and social support systems.

Furthermore, many of these impacts are also accumulative: Internal and international displacement of communities leads to the breakdown of traditional leadership and institutions, restrictions on mobility reduces productivity and increases poverty. Ultimately conflict can itself lead to more conflict and the emergence of new and violent 'social norms' and chronic insecurity. Conflict is undermining pastoralism and posing a significant threat to livelihoods already threatened by drought and disease, and social, political and economic marginalisation (Schilling et al. 2012).

5.2.2 Responses to conflict

Given the complexity of the underlying causes of conflict in pastoral areas, it is not surprising that the responses should also be many and diverse, at different scales geographically and politically.

Support at the local level ranges from facilitating dialogue and negotiations between groups for the establishment of community based conflict early warning systems – e.g. village or district peace committees, supporting the involvement of women, facilitating local dialogue and negotiation, and supporting traditional peace meetings.

More violent and chronic conflicts have seen police or military action/violence, the deployment of peacekeepers, support to militia and disarmament programmes.

Box 5.5 Past and current regional initiatives to address pastoral conflict in eastern Africa

- Nairobi Protocol on Small Arms and Light Weapons
- AU Pastoral Policy Initiative
- AU-IBAR Cross-Border Livestock Health Programme
- IGAD Conflict Early Warning and Response Mechanism (CEWARN)
- USAID's Regional Enhanced Livelihoods for Pastoralist Areas (RELPA)
- COMESA Pastoral Areas Coordination Analysis and Policy Support (PACAPS)
- IGAD/FAO Livestock Policy Initiative (IGAD-LPI)
- ISS/EAPCCO Mifugo Project
- East African Community Livestock Development Strategy

National level conflict resolution initiatives – Kenya

- Karamoja Disarmament, Development and Pacification Programme (KIDDP)
- Ministry of State for Development of Northern Kenya and Other Arid Lands
- Arid Lands Resource Management Project (ALRMP)
- Draft National Policy on Conflict Management and Peace Building – Kenya
- Pastoral Community Development Project (PCDP)

Policy and advocacy can also play important roles in mitigating conflict in pastoral areas, through addressing the underlying causes of pastoral vulnerability. Measures to help resolve conflict need to promote:

- Recognition of pastoralism and investment in support of pastoral institutions and livelihoods, thereby addressing some of the underlying causes of conflict.
- Political and policy recognition and legal support for traditional institutions to play their part in conflict management.
- Empowerment of women in decision-making and in conflict management.
- Research on emerging causes of conflicts and how they can be addressed.
- Mobilisation of communities in the spirit of solidarity to promote co-existence and good neighbourliness.

References and further reading

Cotula, L., Vermeulen, S., Leonard, R., and Keeley, J. 2009. Land grab or development opportunity? Agricultural investment and international Land deals in Africa. London/Rome: IIED/FAO/IFAD.
https://dlc.dlib.indiana.edu/dlc/bitstream/handle/10535/6178/land%20grab%20or%20dev%20opportunity.pdf?sequence=1

Devereux, S. 2006. Vulnerable Livelihoods in Somali Region, IDS Research Report 57, Institute of Development Studies, UK.
www.ids.ac.uk/files/Rr57.pdf

Dowie, M. 2011. Conservation refugees: The hundred-year conflict between global conservation and native peoples. MIT Press.

Evangelou, P. 1984. Livestock development in Kenya's Maasailand: pastoralists' transition to a market economy. Colorado: Westview Press.

Hardin, G. 1968. The tragedy of the commons. Science, 162, 1243–1248.

Hendrickson, D., Armon, J., and Mearns, R. 1998. The changing nature of conflict and famine vulnerability: the case of livestock raiding in Turkana District, Kenya. Disasters, 22(3), 185-199.

Hodgson, D.L. 2001. Once intrepid warriors: Gender, ethnicity, and the cultural politics of Maasai development. Indiana University Press.

Hundie, B. 2010. Conflicts between Afar pastoralists and their neighbors: Triggers and motivations. International Journal of Conflict and Violence, 4(1), 134-148.
http://ijcv.org/index.php/ijcv/article/viewArticle/56

Hussein, K. 1998. Conflicts between farmers and herders in the semi-arid Sahel and East Africa : a Review. IIED Pastoral Land Tenure Series No. 10. IIED: London.
http://pubs.iied.org/7386IIED.html

Krätli, S., and Swift, J. 2003. Understanding and managing pastoral conflict in Kenya. University of Sussex, UK. www.eldis.org/fulltext/pastconf.pdf

Ostrom, E. 1990. Governing the commons: the evolution of institutions for collective action. Cambridge: Cambridge University Press.

Schilling, J., Opiyo, F. E., and Scheffran, J. 2012. Raiding pastoral livelihoods: motives and effects of violent conflict in north-western Kenya. Pastoralism, 2(1), 1-16.
http://link.springer.com/article/10.1186/2041-7136-2-25/fulltext.html

Swift, J. 1995. Dynamic Ecological Systems and the Administration of Pastoral Development, pp. 153-173. In: Scoones, I. (Ed.), Living with Uncertainty. New Directions in Pastoral Development in Africa. IT Publications, London.

Tache, B, and Irwin, B. 2003. Traditional institutions, multiple stakeholders and modern perspectives in common property. Accompanying change within Borana pastoral systems. Securing the Commons No. 4. IIED/SOS Sahel.
http://pubs.iied.org/9238IIED.html

WISP 2007. Pastoral institutions for managing natural resources and landscapes. World Initiative for Sustainable Pastoralism Policy Brief No. 6.
https://cmsdata.iucn.org/downloads/pastoralist_institutions_for_managing_natural_resources_and_landscapes.pdf

6. The role of pastoralism

Summary

This chapter considers the role of pastoralism at the household level, as well as at national and regional levels:

- Livestock contribute to sustainable livelihoods through a number of different types of capital they provide - human, natural, physical, social, financial and political.
- Within the pastoral system a number of 'vulnerabilities' — social, economic and environmental — exist that impact on people's livelihoods and their assets and can increase their vulnerability.
- Although livestock are the central pillar of the pastoral system, pastoral families move in and out of pastoralism when the herd becomes too small to support the family, and supplement their livelihoods with alternative income generating activities, including rain-fed agriculture, petty trade and wage labour.
- The value of pastoralism to national economies in the Horn of Africa has been commonly underestimated and misrepresented, justifying underinvestment and poor policy outcomes. Many of these estimates have been based on poor or out dated data and calculations.
- Recent studies recalculate the contribution of livestock to national economies in Ethiopia and find revised estimates that are 47 per cent higher than previous government estimates. For example, livestock's contribution to agricultural GDP in Ethiopia increases from 25 per cent to 45 per cent.
- These figures do not account of the secondary income that livestock production can generate, for example through the nyama choma trade.
- As well as these monetary contributions, pastoralism also provides a number of non-monetary beneftis – such as being a source of savings and insurance and social capital.
- Pastoralism also brings a number of indirect benefits to national economies such as; making productive use of arid lands, conserving rangeland biodiversity and supporting wildlife conservation and the associated tourism industry.
- Total Economic Valuation (TEV) is one way to understand the full value of pastoralism, taking account of the full range of direct and indirect goods and services from pastoralism, and is being increasingly used in valuation studies.

Brainstorming questions

1) What are strategies by which pastoralists cope with variability, vulnerability and risk in their livelihoods?
2) Why is it important to understand the full range of values of pastoralism in national economic policy and planning?
3) How might use of Total Economic Valuation (TEV) be better suited and go beyond conventional economic criteria when evaluating the contribution of pastoral systems to national economies?

6.1 Pastoralism as a sustainable livelihood

A livelihood can be defined as `the means of securing the necessities of life'. Sustainable livelihoods (Box 6.1) share three common features:

- They are based on resources or `assets' that can be social or economic that provide a living (food security, reduced vulnerability, health and well-being, etc.);
- Sustainable livelihoods are able to cope and recover from shocks (e.g. economic or environmental);
- Sustainable livelihoods do not undermine the resource base on which they depend.

Box 6.1 What is a sustainable livelihood?

"A livelihood comprises the **capabilities, assets** (including both material and social resources) and **activities** required for a means of living. A livelihood is sustainable when it can **cope with and recover from stresses and shocks,** maintain or enhance its capabilities and assets, while not **undermining the natural resource base.**" (Scoones 1998)

It is possible to categorise the resources, or `assets' on which sustainable livelihoods depend into six types:

- **Human capital:** skills and knowledge of family/people, the ability to work, good health, strength, etc. Quantity and quality of labour.
- **Social capital:** the networks and relationships that people develop and use to build trust and enable them to work together effectively and efficiently; relationships of reciprocity and exchange; working in cooperation; providing safety nets and support.

- **Natural capital:** natural resources on which a livelihood depends; pastures, water, soil, trees and tree products, genetic resources, etc.
- **Physical capital:** infrastructure and producer goods that support a livelihood and allow people to be more productive – shelter, transport, tools, etc.
- **Financial capital:** these are both inflows of cash from income, gifts, etc as well as stocks and savings held by a family.
- **Political capital:** political representation and ability to engage with political and policy issues external to pastoral system at regional, national and local levels.

Figure 6.1: Livestock marketing: The skills associated with marketing livestock represent human capital and the importance of livestock marketing to the national economy is a form of financial and political capital.

Many of the assets involved in pastoralism have been addressed in Chapters 3, 4 and 5, and the following types of capital identified:

- **Human capital:**
  - Knowledge and skills of animal breeding and management including diseases
  - Knowledge of the natural environment (plants, wildlife)
  - Livestock used to fund education
- **Social capital:**
  - Family/clan networks: eg. inheritance, marriage, initiation, peace-making, water management committees

- Sharing, loaning and gifting of livestock between families and neighbours
- Social protection systems

- **Natural capital:**
  - Pastures (grasses, tree products), salt, water, minerals
  - Highly variable resources in time and space
  - Livestock and diverse variety of breeds
- **Physical capital:**
  - Pack animals, shelter, tools
  - Mobile phones, vehicles, weapons, wells, animal corrals, etc.
  - Livestock markets, roads
- **Political capital:**
  - Pastoral parliamentary groups, advocacy NGOs
- **Financial capital:**
  - Livestock as a major asset: income from sales; savings for insurance; means of production and reproduction
  - Remittances, salaried work, sales from NTFPs.

It is clear from the above list that livestock contribute to sustainable livelihoods as many different forms of capital. Livestock are a form of natural capital from which resources are derived (e.g. milk, meat, hides), and a form of financial capital, as savings, an investment and readily available source of cash. Livestock are also an important form of social capital that cement social relationships, networks and obligations, but also a source of identity and cultural belonging. The skills and rich knowledge pastoralists possess on livestock health, production and the natural environment is a form of human capital. Livestock can be used as a form of physical capital, through traction and transport capacities. Finally, the importance of livestock marketing to the national economy is a form of economic and political capital (Figure 6.1)

These livelihood assets can be destroyed or created by what has been called the vulnerability context within the Sustainable Livelihoods Framework (DFID 1999). The vulnerability context specifically describes the economic, social and environmental context that impact directly on people's livelihoods, and identifies hazards that increase the vulnerability of people to deepening poverty. In the case of pastoral livelihoods, the vulnerability context includes:

- **Trends** (such as increasing or decreasing population growth, improving or worsening economic situation, etc), that impact on livelihoods slowly, over a period of time.
- **Shocks** (conflict, disease), that often occur with little or no warning and have sudden impact; and
- **Seasonality** and **inter-annual variability** (in availability and quality of natural resources as well as prevalence of disease, incidence of drought and/or floods, the balance of trade in markets, milk production etc.) that are expected and 'part of the system', but are not necessarily predictable (i.e. we do not know when or what exactly will happen), and will have variable outcomes from one season and year to the next.
- The **convergence of hazards**, that individually may have long been present, but are all now occurring at the same time (e.g. increasing population, changing frequency of drought, loss of mobility and access to key resources), and together can have a proportionately bigger impact on the vulnerability of livelihoods than when they occur in isolation.
- Likewise, **policies and institutions** can either build or reduce assets. For example, a good education policy can build human capital or a bad land law can reduce access to natural capital.

The quality and quantity of a family's assets impact on the strategies that a family can follow to proactively manage environmental variability and unpredictability, and adapt to changing policy or institutional environments. For example, families or households with larger herds and more people can reduce risk by splitting their herds, and build more social capital through making loans and gifts to others.

6.2 Economic contribution of pastoralism to the family

Livestock lie at the heart of the pastoral livelihood system – they are the central pillar. However, pastoralism has long been supplemented by additional income generation and livelihood strategies. These have included relatively small-scale rain-fed or flood-retreat agriculture, the use of non-timber forest products, sale of artisanal crafts (e.g. beads, jewelry, leather goods) and wage labour (e.g. herding, security). Although, livestock sales and livestock products contribute the greatest to household income, these other activites can also make important contributions (Figure 6.2).

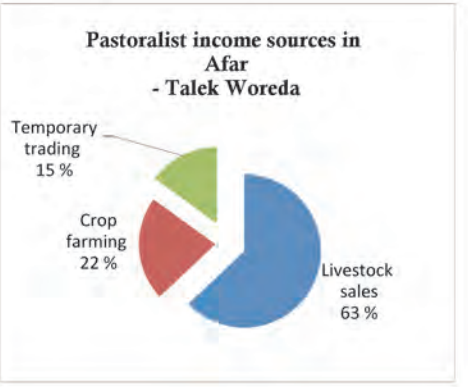
Families or individuals from within pastoral families may also move in and out of pastoralism over time and to differing degrees, finding alternative employment when the herd becomes too small to support the family, and then moving back into pastoralism when it has been possible to invest in and grow the livestock herd.

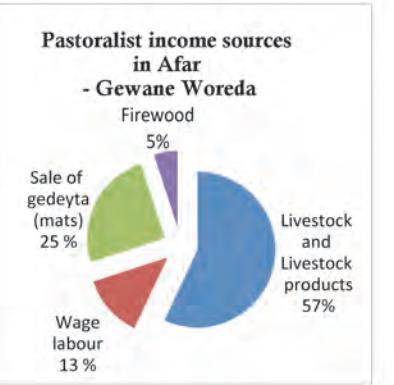
Figure 6.2 For many poorer pastoralists, additional income sources allow them to protect and invest in the (re)growth of their herd. Small-scale trade is a particularly important source of income for women.

Unlike other livestock production systems (e.g. ranching), income from livestock sales represents only a small proportion of the value of livestock to the pastoralist family (see Chapter 1 and Chapter 4 for the differences between pastoralism and other livestock production systems). The majority of pastoralists, particularly those with smaller herds, gain far more value from the non-monetary services of their herds – as a source of food (meat and milk), manure, draught power and hauling services, savings, insurance, social capital and women's empowerment.

Figure 6.3 Contrary to popular opinion, women play an important role in livestock marketing, as owners of livestock, through their knowledge of the productivity of milk cows, and directly through the sale of milk, small stock, and hides.

As shown in Chapter 5, many pastoralists, particularly the poorest, do not rely on meat and milk exclusively in their diet and will tend to sell livestock to purchase cheaper sources of calories, typically staple grains. However, research shows that it is primarily the wealthiest pastoralists that are most engaged in the marketing of livestock at a regional level and make most gains from policies that support trade (Catley et al. 2013).





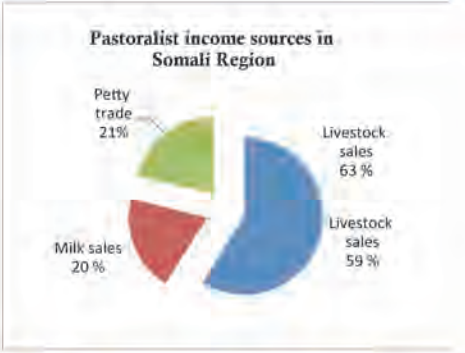


Figure 6.4 Contribution of livestock to household income in three Ethiopian areas/regions. Source: Gebru and Desta (2003)

6.3 Evaluating the national economic contribution of pastoralism

It was estimated that the value of the pastoral livestock and meat trade in the Greater Horn of Africa was US$1 billion in 2010 (Catley et al. 2013). However, within countries such as Ethiopia and Kenya, the value of this trade continues to be underestimated, misrepresenting the value of pastoralism to the national economy, and justifying under investment at best, or poor policy outcomes at worst for pastoral production systems.

In 2006, there were an estimated 12-15 milllion pastoralist people in Ethiopia out of a national population of 83 million. Pastoralists are a minority, and have long been considered to be more interested in accumulating livestock than engaging in livestock trade. However, there are huge regional livestock trade networks in The Horn of Africa that connect pastoralists to markets in Addis Ababa , Nairobi and beyond (Catley et al. 2013). Pastoralists selectively trade livestock to optimise herd structure (Chapter 4) and pastoralists are responding to (and not ignoring) market demands and opportunities in dynamic and innovative ways (Catley et al. 2013). For example, pastoralists in northern Kenya/southern Ethiopia have responded to the increased demand for camel and camel meat in Arabian countries with vibrant camel marketing and trade activities (Mahmoud 2013). A recent study by the International Livestock Research Institute (ILRI) found market access made a significant difference in the average number of sales per livestock keeper as a percentage of their herd, suggesting that more herders would sell livestock if access to markets were improved.

Government valuations of livestock contributions to the national economy have long been considered inadequate and inaccurate. In Ethiopia, livestock contributions to the national GDP are based on estimates of livestock populations and a series of estimates of market prices and offtake rates (for sale, milk production and dung for fuel). Inputs to the system include the costs of prepared animal feeds, vaccines, salt for cattle, oil cake and artificial insemination.

Figure 6.5 Nearly a third (31 per cent) of the total gross value of livestock output is represented by the value of animal draught power as an input into crop cultivation, an estimated 21.500 billion EB in 2008-09. (Behnke 2010)

A recent working paper from IGAD's Livestock Policy Initiative (LPI) found many of the coefficients used to calculate the livestock contribution to GDP were too low and livestock population figures did not include significant pastoral areas in Somali and Afar Regions (Behnke 2010). Available government data were not disaggregated according to the different systems in which livestock are reared – for example milk production figures were averaged and did not take account of the difference in milk productivity or scale of dairy herds (a very low number in Ethiopia), agropastoral cattle and pastoralist cattle. The IGAD review suggested that the current government estimate that livestock contribute about 25 per cent of total agricultural GDP in 2008/9 should be revised to 45 per cent of agricultural GDP.

Much of this increase can be attributed to the value given to livestock traction in agricultural production – including the value of animal traction, the value of ruminant production was valued at 48 Billion Ethiopia Birr in 2008-2009, an increase of 47 per cent of the government's official figure (Behnke 2010).

A similar study in Kenya reassessed the contribution of livestock to national GDP and found that livestock contributed 150 per cent more than previous government estimates (Behnke and Muthami 2011).

These revised figures do not take into account the secondary income sources that livestock production, and particularly livestock from pastoral areas can generate for example through the Nyama Choma (roast meat) trade (see Box 6.2). These revised figures do not also take into account non-monetary values of livestock production. Livestock benefit pastoral (and agro-pastoral) families directly as a source of savings and insurance, social capital, manure for small-scale agricultural production. Pastoralism also supports significant industry supply chains involving raw materials found on the rangeland or forests – such as gums, resins, fruits and foods, and medicines. Many of these resources and supply chains provide employment to pastoral women and/or poorer members of the community.

In addition to the direct benefits that pastoralist families derive from their livestock and rangelands, pastoralism as a system brings indirect benefits to the national economy, making productive use of arid lands, conserving rangeland biodiversity, and supporting wildlife conservation (CBD 2010).

Figure 6.6 Livestock access to pastoral areas can represent a win-win for agricultural and pastoral systems – providing manure for crops and dry season grazing on crop residues. While conflict between farmers and herders over crop damage/lost access to pastoral areas is a significant problem, where communities have been able to re-establish positive relations, as occurred in Kenya during the droughts of 2009 both communities have benefited. (Letai and Lind, 2013)

Box 6.2 The nyama choma economy in Arusha, Tanzania

A study carried out in November 2005 sought to quantify the scale and extent of the nyama choma (NC) business in Arusha city, to provide proxy data to further understand the contribution of pastoral society to the national economy of Tanzania.

Historically, nyama choma (roast meat) was a traditional pastoral economic activity where pastoral men served roasted meat on market days. It has since expanded to all urban and trading centres of Tanzania. It has a short supply chain, with usually only one middleman who arranges slaughter at the abattoir. The abattoir sells the meat to the town butchers, who then sell it to nyama choma businesses. These are located within pubs and bars selling alcohol and are thus integrated within the market fabric of localities and are an important element found in all trading centres. In Arusha town, 94 per cent of the meat slaughtered at the abattoir comes from pastoral areas. Interviews with several NC businesses confirmed that the meat they sell is exclusively from pastoral areas as customers prefer its taste.

Nyama choma businesses are largely in the informal sector, but have formal commitments at a local level. This includes paying medical examination fees for each employee, land and property taxes, business licences, refuse collection. The supply chain also contributes to meat examination fees at three levels – pre-harvest, at abattoir and in the market – which accrue to the municipality for paying employees involved in veterinary services. Plus, the supply chain includes businesses in the formal sector, such as the abattoir, that pay taxes.

Since 1991, slaughter has been centralised and its cost subsidised to some extent by donor funding. Centralisation enables grading of meat for sale (four grades) and hence higher returns, and higher hygiene standards. In general, meat produced in pastoral systems is the lowest two grades. Other economic characteristics include:

- The NC sector is very competitive.
- NC businesses are an efficient system for using all possible parts of a slaughtered animal.
- NC was traditionally seasonal, but now is part of daily life and as such, demand for slaughter is year-round, potentially freeing pastoralists from seasonal sale constraints. In 2005, over 31,000 cattle were slaughtered in Arusha mostly for NC.

In Arusha, there are 601 NC businesses (in 2005), employing 5,600 people, with an estimated 25,000 dependents. Plus, an estimated 2.4 jobs are supported along this supply chain for each NC worker - involved with ancillary services in butchery, middlemen and of course primary beef production. It is estimated 6.6 per cent of the population of Arusha receive crucial livelihood support through the meat supply chain for NC from pastoralist cows. If we assume these data are applicable to the entire country, 2.2 million people obtain some of their income from the pastoral meat trade and supply chain through 15,600 NC businesses with an annual turnover of USD 22 million.

Further evidence from this research provides an added glimpse of the economic significance of pastoralism, indicating that each pastoral cow slaughtered supports the following outside of the pastoral economy: 0.24 full-time jobs in the Tanzanian economy; 1.07 dependents; and US$172 worth of economic value-added in the economy.
Source: Letara et al. 2006

For example, pastoralism contributes indirectly to local and national economies in a number of ways:

- Drylands constitute nearly half the land area in sub-Saharan Africa, and pastoralism makes productive and efficient use of the scarce resources that exist across these areas that would otherwise be un-used or poorly used.
- Biodiversity conservation and tourism. In northern Tanzania, the annual pastoral land uses to the wildlife-based tourism industry is estimated at approximately US$83.5 million (Nelson 2012). Many protected areas in East Africa's drylands were originally pastoral dry season grazing areas populated by relatively abundant wildlife co-existing alongside domestic stock. The preservation of wildlife and dramatic scenery in these areas is largely due to the practice of pastoralism over other forms of land use such as agriculture or mining. Following their often forceful expropriation, few benefits have been returned to the displaced pastoral communities.
- In addition to tangible benefit generation through handicraft sales, traditional village installations and cultural performances that directly bring some revenue to pastoral communities, the material culture of pastoralists benefits artisans and merchants and indirectly intensifies tourist interest in the culture and lives of pastoral and other rural communities.

- For many tourists, pastoral societies evoke feelings that attract initial and repeat visits to East Africa. Northern tour operators and their East African affiliates regularly use pastoral imagery to sell their products. A range of other industries including airlines and mobile phone companies also use similar.

Figure 6.7 Northern tour operators and their East African affiliates regularly use pastoral imagery to sell their products. A range of other industries including airlines and mobile phone companies also use similar marketing practices.

- Improved agricultural returns (e.g. traction and manure). Many pastoral systems in East Africa are agro-pastoral systems and such there are a number of synergies between agriculture and pastoralism that enhance the value of one another through complementary land use.
- Employment. A minimum of 9 million (and as high as 20 million) pastoralists live in East Africa, of which an estimated 60 per cent are adults of working age gainfully employed in raising livestock and other subsidiary activities (e.g. livestock trade). In arid and semi-arid rural areas, pastoralism and agro-pastoralism are often the only form of employment. Displacement of pastoralism will result in unemployment, urban drift, migration and a host of issues that have very direct and tangible costs for the national economy (e.g. conflict).

One means to evaluate the contribution of pastoralism is called the the Total Economic Value (TEV) (Hatfield and Davies 2006; Hesse and MacGregor 2006; Rodriguez 2008). TEV was initially developed in the field of civil engineering in the late 19th century to calculate the value obtained from investments in infrastructure. The approach was adapted in the 1980s by the conservation sector to value both the market and non-market values of biodiversity. The TEV framework is now increasingly being used by researchers, NGOs and regional bodies to help map out the many values pastoral systems contribute to national and regional economies (Krätli 2014).

Identifying goods and services from an informal sector such as pastoralism, determining who values them and how best to measure them, is not a straight forward process. However, until the full value of pastoralism can be expressed in monetary and non-monetary terms, it is unlikely that the system as a whole will receive the political support that reflects its true value to the national economy.

The value of pastoralism against alternative land uses

Misconceptions regarding pastoralism have results in pastoralism being undermined by the appropriation of land in favour of alternative and often more intensive land uses. However, a number of recent studies show that pastoralism matches or outcompetes other land uses. For example:

1) In the Awash Valley, Ethiopia, Behnke and Kerven (2013) find that pastoral livestock production yields greater returns per hectare than large-scale, irrigated cotton or sugar production.
2) In Loliondo District, northern Tanzania, per hectare revenues from livestock are greater than revenues from wildlife hunting concessions, photographic safaris and revenues from Serengeti National Park (Galaty 2013).
3) In five sites in Maasailand in northern Tanzania and southern Kenya, livestock contribute more than half of pastoralists total household income, ahead of cropping or off-farm work (Homewood et al. 2012).

These studies highlight the importance of livestock, and how the conversion of pastoral land to other land uses is not justified economically. Rather, governments seek to replace pastoralism with alternative land uses, because they are able to exert greater control over these activities (e.g. cash crops or hunting revenues), often through greater taxes and contributions to the state. Pastoralism escapes some of these contributions, as much pastoral trade is informal and invisible, and thus undervalued, so governments seek to gain more from alternative land uses (Behnke and Kerven 2013).

Taking land out of pastoral use, would also reduce the long-established networks of exchange and trade between herders and farmers, and the many direct contributions pastoralism makes to farming and thus the wider economy.

Box 6.3 Key points – valuing pastoralism (Hesse and MacGregor 2006)

Globally, livestock is growing faster than any other agricultural sub-sector, and it is predicted that by 2020 it will produce about 30 per cent of the value of global agricultural output.

A significant, but unknown proportion of the national livestock herd in East Africa are raised in pastoral areas.

Pastoralism is estimated to be worth US$800 million in Kenya alone, and its value will increase as demand for meat and related products rise with a growing urban population.

Pastoralism has other benefits. Livestock raised under pastoral systems are very cost effective, supports an estimated 20 million people who otherwise would require alternative livelihoods, makes optimal use of scarce resources with minimal environmental costs, and represents an important reservoir of knowledge and experience of good environmental management under conditions of increasing climate change.

Through common property resource tenure regimes it greatly contributes to social capital and nourishing collaborative and peaceful relations between different groups.

It is also important for the success of key sectors of the East African economy (e.g. tourism, conservation, agriculture) as well as informal (e.g. nyama choma).

Existing national statistics fail to capture these benefits. Data are inaccurate and inadequate, failing to disaggregate pastoralism from other forms of livestock keeping and focusing on a very limited set of direct outputs, which do not reflect the full contribution of pastoralism to local and national economies.

References and further reading

Behnke R. 2010. The contribution of Livestock to GDP in the IGAD Member States. Study Findings, Application of the Methodology in Ethiopia and Recommendations for Extension of the Programme. IGAD-LPI Working Paper 02-10, IGAD-LPI, Addis Ababa.
https://igadlpi.files.wordpress.com/2011/07/igad-lpi-wp-0210-the- contribution-of-livestock-to-the-ethiopian-economy-part-i_oct10_ad.pdf

Behnke, R.H., and Kerven, C. 2013. Counting the costs: replacing pastoralism with irrigated agriculture in the Awash Valley, north-eastern Ethiopia. IIED Climate Change Working Paper No. 4.
http://pubs.iied.org/10035IIED.html

Behnke, R.H., and Muthami, D. 2011. The contribution of livestock to the Kenyan economy. FAO IGAD Livestock Policy Initiative Working Paper No. 3. Rome: FAO.
www.odessacentre.co.uk/uploads/3/9/1/2/39125553/igad_kenya.pdf

Catley, A., Lind, J. and, Scoones, I. 2013. Development at the margins: pastoralism in the horn of Africa. In: Andy Catley, Jeremy Lind, and Ian Scoones (eds.), Pastoralism and Development in Africa: dynamic change at the margins. Abingdon and New York: Routledge, pp 1-26.

CBD 2010. Pastoralism, Nature Conservation and Development: A Good Practice Guide. Convention of Biological Diversity. Montreal.
www.cbd.int/development/doc/cbd-good-practice-guide-pastoralism-booklet-web-en.pdf

DFID 1999. Sustainable Livelihoods Guidance Sheets: Introduction. Department for International Development.
www.eldis.org/vfile/upload/1/document/0901/section2.pdf

FAC CAADP 2012. Pastoralism in the Horn of Africa: Diverse livelihood pathways. Future Agricultures. FAC CAADP Policy Brief 06. March 2012.
www.future-agricultures.org/policy-engagement/policy-briefs/ 1531-pastoralism-in-the-horn-of-africa-diverse-livelihood-pathways/file

Gebru, G., and Desta, S. 2003. The State of Pastoral Production and Food Security: the case of Borana Pastoralists of Southern Ethiopia. Presentation at the EDRI/IFPRI workshop on 'Towards Sustainable Food Security in Ethiopia: Integrating the agri-food chain', Ghion Hotel, Addis Ababa, Ethiopia, 15-16 May 2003.

Galaty, J.G. 2013. Land Grabbing in the Eastern African Rangelands. In: Andy Catley, Jeremy Lind and Ian Scoones (eds.), Pastoralism and Development in Africa: dynamic change at the margins. Abingdon and New York: Routledge, pp. 143–153.

Hatfield, R., and Davies, J. 2006. Global review of the economics of pastoralism. World Initiative for Sustainable Pastoralism/IUCN, Nairobi, Kenya. https://cmsdata.iucn.org/downloads/global_review_ofthe_economicsof_pastoralism_en.pdf

Hesse, C. and MacGregor, J. 2006. Pastoralism: Drylands' Invisible Asset. Drylands Issue Paper No. 142, Drylands Programme, International Institute for Environment and Development, London. http://pubs.iied.org/12534IIED.html

Homewood, K., Trench, P.C., and Brockington, D. 2012. Pastoralist livelihoods and wildlife revenues in East Africa: a case for coexistence? Pastoralism 2, 19.

IGAD LPI 2011. https://igadlpi.wordpress.com/2011/07/05/further-igad-lpi-studies-indicate-the-economic-contribution-of-ethiopia%E2%80%99s-livestock-is-3-5-times-higher-than-current-estimates/

IUCN 2011. Supporting Sustainable Pastoral Livelihoods: A Global Perspective on Minimum Standards and Good Practices. Second Edition March 2012: published for review and consultation through global learning fora. Nairobi, Kenya: IUCN ESARO Office. vi + 34pp. https://cmsdata.iucn.org/downloads/manual_for_min_standards_low_resoultion_may_2012.pdf

Krätli, S. 2014. If not counted do not count? A programmatic reflection on methodology options and gaps in Total Economic Valuation studies of pastoral systems. Issue Paper, International Institute for Environment and Development, London. http://pubs.iied.org/10082IIED.html

Letai, J., and Lind, J. 2013. Squeezed from all sides: changing resource tenure and pastoralist innovation on the Laikipia Plateau, Kenya. In: Andy Catley, Jeremy Lind, and Ian Scoones (eds.), Pastoralism and Development in Africa: dynamic change at the margins. Abingdon and New York: Routledge.

Letara, J., MacGregor, J., and Hesse, C. 2006. Estimating the economic significance of pastoralism. The example of the nyama choma sector in Tanzania. RECONCILE/IIED
http://pubs.iied.org/G00242.html

Mahmoud, H.A. 2013. Pastoral Innovative Responses to New Camel Export Market Opportunities on the Kenya/Ethiopia Borderlands. In: Andy Catley, Jeremy Lind and Ian Scoones (eds.). Pastoralism and Development in Africa: dynamic change at the margins. Abingdon and New York: Routledge, pp. 98–107.

Nelson, F. 2012. Natural Conservationists? Evaluating the impact of pastoralist land use practices on Tanzania's wildlife economy. Pastoralism: Research, Policy and Practice 2(15), 2–19.
www.pastoralismjournal.com/content/2/1/15

Pica-Ciamarra, U., Nouala, S., Kim, S., 2011. Livestock and Livelihoods in the IGAD Region: A Policy and Institutional Analysis. IGAD-LPI Working Paper No 01-11.
https://igadlpi.files.wordpress.com/2011/07/igad-lpi-wp-01_11_ livestock-livelihoods-in-the-igad-region_a-policy-and-institutional-analysis_ad.pdf

Rodriguez, L. 2008. A global perspective on the total economic value of pastoralism: global synthesis report based on six country valuations. WISP: Nairobi.
http://cmsdata.iucn.org/downloads/tev_report.pdf

Scoones, I. 1998. Sustainable Rural Livelihoods: A framework for analysis. IDS Working Paper 72, IDS, Brighton, UK.
www.staff.ncl.ac.uk/david.harvey/AEF806/Sconnes1998.pdf

SOS Sahel 2006. Pastoralism in Ethiopia: Its total economic values and development challenges.
www.labatafantalle.org/downloads/Value_Pastoralism_Ethiopia.pdf

7. Pastoralism and policy directives

Summary

The chapters so far have described how pastoralism as a production system makes productive and rational use of a natural environment that is inherently variable and unpredictable. However, the three pillars of pastoralism – natural resources, the herd, and the family – do not exist in isolation. National and international policies, including those that govern land tenure and access, trade, health, veterinary services and education, all play a crucial role in determining whether pastoral systems can provide viable livelihoods. In this chapter we look at public policies in Ethiopia and Africa more widely and how they have impacted on the pastoral economy, society and environment. Some of the main issues that emerge are:

- Since colonial times, policies have viewed pastoralism as uneconomic and environmentally destructive, and have sought to modernise pastoral systems and sedentarise pastoral populations.
- There is now however a rise in more pro-pastoralists policies. For example, the African Union Pan African Policy Framework of 2010 recognises the economic, cultural and social importance and contribution of pastoralism across Africa.
- National development policies are beginning to recognise pastoralism as a valuable livelihood, but still favour the commercialisation of agriculture, the sedentarisation of pastoralists and a reduction in mobility.
- Ethiopia's pastoral areas have lacked specific land use and administration policies. There are now efforts by regional states to formulate their own land use and administration laws, but these are hampered by federal law that reaffirms powers over land to the state.
- Historically, land policy in East Africa has been based on the need for nationalisation or privatisation and was influenced by Garett Hardin's 'tragedy of the commons'. This is, however, more relevant to open access resources, rather than the pastoral rangelands which are better described as common property resources.
- The growth in trade and export of livestock, and the demand for livestock products, means pastoralists need supportive livestock marketing policies.
- Decentralised veterinary services in the form of Community Animal Health Workers are offering accessible, affordable and accountable provision of livestock health care.

As pastoralists seek greater educational opportunities, there is a demand for more mobile-based systems of education that are compatible with the pastoral lifestyle.

Brainstorming questions

1) Why is it not one policy or ministry that will determine the success of pastoralism in the future? Why is there the need to integrate policies?
2) Why is there a need to coordinate livestock policies and initiatives across international borders?

Policy and law are closely linked, but different (see Box 7.1 for definitions). A policy spells out the values and aspirations of a society on a specific public issue and commits the government to promote those values. A law, on the other hand, translates policy stipulations into actionable commitments which citizens can enforce by court action.

Box 7.1 Definitions of policy and law

A **policy** is a statement by the government or other public institution setting out the ideals, aspirations, guiding principles, goals, approaches and procedures for addressing a public issue.

A **law** is a written statement of rules enacted by a duly constituted law-making organ of a political collective specifying rights and duties binding on the subjects, as well as remedies and penalties for failure to comply with those rules. An enactment of law will also specify procedures and institutions for its enforcement.

ROLE OF POLICY	ROLE OF LAW
• Creates criteria for decision-making and action by government, and a basis for accountability. • Articulates consensus on a critical issue, reconciling competing interests among different citizen groups. • Fosters predictability in government decision-making and action, ensuring decisions are not based on the whims of public officials.	• Embodies the collective values of a society and establishes what can and cannot be done. • Defines rights and obligations of individuals and groups. • Establishes institutions of governance and defines their roles. • Allocates responsibility to individuals and institutions and specifies sanctions for breach. • Provides a framework for implementation of policy to realise agreed objectives.

7.1 Overview of policies on pastoralism

Policies and laws have played, and continue to play, a critical role in defining and regulating how current pastoral production systems function across Africa. The Berlin Conference of 1884 is widely considered to be the start of the systematic invasion, occupation, colonisation and annexation of African territory by European powers between 1881 and 1914 (the period of New Imperialism). In 1870, only 10 per cent of Africa was under European control; by 1914 it was 90 per cent of the continent, with only Abyssinia (Ethiopia) and Liberia retaining their independence.

The definition of nation states in Africa under the period of new imperialism and then colonialisation divided many pastoral people and their lands between two or more countries. Pastoralists found themselves in border regions far from the capital cities, the seats of economic and political power.

Colonial and independent governments have consistently tried to sedentarise pastoral populations in order to make it easier to provide social services as well as to govern (tax and police) them, paying little attention to the critical importance of mobility to make efficient use of the environment and natural resources. The introduction of centrally defined policies and laws for the management of land and land-based resources largely ignored local customary institutions that had managed the rangelands and their resources over hundreds of years.

In Ethiopia, as in other countries in The Horn of Africa, government policies have favoured sedentary farming over pastoralism. These policies are often driven by unfounded perceptions that pastoralism is economically inefficient and environmentally destructive. As we have seen in Chapter 6 this is not the case.

Many government policies have not recognised pastoral livestock production as an important part of the national economy and rural livelihoods. There has been a long history of political and economic marginalisation of pastoralists. Governments have tended to view pastoral lands as 'empty' and 'idle' wastelands in need of investment and conversion. Pastoral lands have been lost to large-scale agricultural development, leading to the loss of pastoral rangelands, the sedentarisation of pastoralists and declining livestock numbers.

There are however some recent positive changes occuring to this dominant negative discourse. In 2010, the African Union published its Pan African Policy Framework for Pastoralism in Africa (Securing, Protecting, and Improving the Lives, Livelihoods and Rights of Pastoralist Communtiites) (AU 2010). The policy recognises the economic, cultural and social importance of pastoralism across Africa, as well as its significant contribution in conserving plant and animal genetic diversity across the continent. The policy framework explicitly aims to mobilise and coordinate political commitment to pastoral systems, and places emphasis on the need for pastoralist women and men to be involved in development processes that are intended to benefit them.

Crucially, the AU pastoral policy framework explicitly recognises livestock mobility as fundamental to the success and productivity of the system in recognition of the high variability and umpredictability of the environment in Africa's arid and semi-arid rangelands, as well as the economic significance of pastoralism as a production system for the continent (Box 7.2).

Box 7.2 Policy recognition of the critical importance of mobility

"Pastoral livestock production systems are mostly found in Africa's vast arid and semi-arid areas. These areas are characterised by marked rainfall variability, and associated uncertainties in the spatial and temporal distribution of water resources and grazing for animals. Pastoralists have developed management systems based on strategic mobility, which are well-adapted to these difficult conditions"

AU Pan African Policy Framework for Pastoralism in Africa, p.7

The AU policy framework sets out two objectives:

Objective 1: Secure and protect the lives, livelihoods and rights of pastoral peoples and ensure continent-wide commitment to political, social and economic development of pastoral communities and pastoral areas.

Objective 2: Reinforce the contribution of pastoral livestock to national, regional and continent-wide economies.

The first objective emphasises the need for policies that recognise the rights and economic contributions of pastoralists within national economies. The second objective focuses on strengthening governance of natural resources on which the system depends.

The AU Policy Framework provides a vision of development pathways in pastoral areas. This framework needs to be translated into national policies and resources allocated for implementation.

Other regional institutions such as the Common Market for Eastern and Southern Africa (COMESA) and the Inter-Governmental Authority on Development (IGAD) are also recognising the important benefits from livestock mobility. COMESA has a livestock trade initiative aimed at addressing the constraint to development in the livestock sector, and improving livestock trade in its region. IGAD's Livestock Policy Initiative addresses the policy and institutional changes needed for the poor to benefit from enhanced livestock production. It has established in country 'policy hubs' to coordinate national level processes.

7.2 National policies on pastoralism

Many national policies impact specifically on the three pillars of pastoralism.

While there are many policies relevant to natural resources, policies relating either directly or indirectly to land are the most contentious for pastoralism in the current political and economic climate of Ethiopia, because of the primacy of land for other livelihoods and for national economic development.

Policies that relate to marketing and veterinary care impact directly on the herd. Many countries have fairly progressive veterinary policies that include the promotion of community-based animal health; the problems lie more in the implementation of policy than its design. The more contentious policies relating to the herd are around marketing, cross-border trade and livestock health issues relating to export.

Policies that impact on the family and customary institutions include policies relating to governance such as decentralisation, and health and education policies. Challenges of tailoring social services to accommodate pastoral livelihood strategies such as mobility should, in theory, be addressed in the context of decentralisation (e.g. elected local governments with the authority to design and implement plans designed speicifcally to address problems in their local areas).

National development policies

In addition to policies specific to the three pillars of pastoralism, there are overarching policies that address national development and set the context for all other polices. The recent main government-wide development policies and strategies that affect pastoralism in Ethiopia today are highlighted below.

These are extracted mainly from the Rural Development Policy and Strategies (RDPS) and successive five year development plans, such as The Sustainable Development and Poverty Reduction Programme (SDPRP), the Plan for Accelerated and Sustained Development to End Poverty (PASDEP) and the ongoing Growth and Transformation Plan (GTP). Specifically PASDEP involves a range of tailored programme and policy responses that are specific to pastoralist areas and people.

The following three are among the policy subjects or issues mentioned in RDPS (MoFED 2003), and are specific to pastoral and agropastoral areas:

1. Ensure pastoral livelihoods and their asset bases through the participation of the pastoral community and the use of pastoralist traditional and formal institutions;
2. Expand and ensure access to basic social services; and
3. Ensure settlement of pastoral community members on a voluntary basis and with adequate and appropriate attention to natural resources and environment conservation.

Each of these policy regimes are explained with substantive strategies and instruments particularly identified in the successive five-year development plans as well as in subsequent studies.

The PASDEP period (2005/6 – 2009/10)

like other agriculture and rural development policies and strategies, the policies and strategies steering pastoral areas development initatives were also subjected to review during the preparation of the successive PRSP five year developemnt plan. In the PASDEP framework, the basic approach to the pastoral development was improving pastoral livelihood and asset bases through the participation of the pastoral community, pastoralist institutions and basic social improvement revived priority. The PASDEP promotes a "massive push to accelerate growth" (MoFED 2006). The PASDEP envisions the commercialisation of the agricultural sector as a pathway out of poverty, specifically: large-scale commercial farming; and large and small-scale irrigation. The private sector plays a central role in the plan, and the reform of land tenure a means to secure investments.

PASDEP recognises the diversity of agro-ecological zones of Ethiopia including the semi-arid lowlands, and has specific provisions for pastoralists.

The special pastoral programme under PASDEP aims to:

- Improve pastoral livelihoods and asset base: improved service delivery. (marketing, animal & human health, education, water) and range management.
- Address livestock movement within and across boundaries.
- Protect pastoral lands.
- Strengthening traditional institutions and designing mechanisms for traditional institutions and modern state political and administrative institutions to support each other to effectively function in pastoral areas.

The GTP 2010/11 – 2014/15 period

The Growth and Transformation Plan (GTP) 2010/11-2014/15 is focused on achieving the Millennium Development Goals (MDGs) through expanded access to higher quality basic services. The plan promotes the role of the private sector, creating favourable conditions for industry, and enhancing the quality of infrastructure development. The plan includes commitment to citizen participation in the planning

and delivery of development activities at the woreda level, requiring investment in capacity-building, good governance and greater transparency.

Under the GTP, strategic directions for agriculture and rural development include:

- Enhancing capacity and extensive use of labour.
- Proper utilisation of agricultural land.
- Taking different agro-ecological zones into account.
- Linking specialisation with diversification.
- Integrating crop, livestock, marketing, natural resources development, as well as agricultural research, extension etc.
- An efficient agricultural marketing system.

A section of the GTP is devoted to pastoral area development strategies within its Economic Sectors Development Plan. Specific pastoral development strategies are broad:

- A strategic focus on livestock resources development.
- Primary emphasis will be given to water resources development.
- This will be accompanied by improvement of pasture land and the development of irrigation schemes.
- Settlement programmes will be executed in order to enable pastoralists to lead settled livelihoods.
- Selection and distribution of local breeds, animal health services, natural resource management, and the establishment of livestock marketing systems are also strategic directions in pastoral area development under the GTP.

Once again, there is an emphasis away from mobility and `traditional livestock production methods' and towards settlement. The Ethiopian Investment Policy regards the "current output per domestic breed of livestock to as low", and seeks investment opportunities "in the areas of modern commercial livestock breeding, production and processing of meat, milk and eggs."

While the PASDEP recognises pastoralism as a livelihood with economic (livestock) and cultural values, and marginalised by past policy and vulnerable to drought and conflict, it is not clear that the drive towards the 'modernisation' of the sector recognises the inherent logic of the 'traditional' system in the context of highly variable and unpredictable environments.

Today, pastoralists are still being evicted from their land by larger interest groups (e.g. irrigation schemes, commercial farms, etc.). Not only are the economic benefits of pastoralism poorly quantified and consistently underestimated by governments (Chapter 6), such enterprises match the government vision of 'modernisation', and also make it easier for governments to capture greater returns through taxes, for example.

During the GTP period, primary emphasis has been on the development of water resources for livestock and human consumption. This task is expected to be accomplished together with the improvement of pasture land and the development of irrigation schemes.

7.2.1 Land and environmental policy

There are no specific land use and administration policies designed for pastoral areas. Existing federal and regional policies are designed primarly to address land use and administration of the highlands, mostly the farming areas and are not practically applicable to pastoral systems. This has meant that successive Ethiopian governments have been ineffective at protecting the rights of pastoralists to land.

There has been an overall absence of policy or legal protection of pastoralists' access to key resources. This absence is particuarly worrisome given the current increase in the large-scale of acquisition of land, or land-grabs, by domestic and foreign investors in Ethiopia, and elsewhere (Cotula et al. 2009).

At the federal level: All policies of the country emanate from the Constitution. The Pastoral areas policy and strategy formulation is not exceptional in this regard. The Constitution of Ethiopia of 1994 affirms state ownership of land and all natural

resources, and at the same time includes the provision that "Ethiopian pastoralists have the right to free land for grazing and cultivation as well as the right not to be displaced from their own lands". However, this protection has not been translated into federal law, and development policy (the PASDEP and GTP) remain in favour of settled agriculture as an alternative livelihood for pastoralists (Mulatu and Bekure 2013). For example, the GTP (2011-2015) stipulates:

"agricultural development will be undertaken by private investors in lowland areas where abundant extensive land exists. Assessment will be made to identify suitable land that will be listed in an organised land bank; and promoting such lands for investment by facilitating for local and external investors to develop it using lease system." (MoFED 2010, p. 25-26).

The general pastoral areas policy direction at different levels, i.e., federal, regional, zonal, woreda and kebele, are guided by policies and strategies contained in the RDPS (2003) and the subsequent refinements and details made in the PASDEP (MoFED 2006). For example, the RDPS, in addition to substantive policies and strategies which focus on voluntarism of pastoralists' settlement, contains explicit mention of customary institutions role in conflict management, while not mentioning their role in matters related to land administration.

At the regional level: The Constitution of Ethiopia confers powers to regional states to enact their own laws concerning land administration and use. Article 17.1 of the Federal Land Adminstration and Use Proclamation No. 456/2005 states that "each regional council shall enact rural land administration and land use law, which consists of detailed provisions necessary to implement this proclamation". However, no provisions are given concerning the tenure and administration of pastoral land. Using powers conferred under the constitution, some pastoral regions have began to formulate their regional land administration and use laws. The Rural Land Use and Administration policy of Afar regional state is the first instance in attempting to develop a pastoral policy in the country. Much of the policy reflects official views towards the customary institutions role in administering pastoral land. It addresses issues and problems related to ownership, transfer and use rights. It also covers land redistribution, registration and sedentarisation issues. These are regional attempts

to address the insecurity of pastoralist land rights. However, provisions in federal policy and law reaffirm the powers of the state to expropriate land in pastoral areas for develoment (Mulatu and Bekure 2013). Thus, in the prevailing federal and regional level land policies and strategies there are still gaps that need to be addressed before there is greater policy and legal recognition of pastoral land rights.

The historical basis of land policy

Land policies currently in place today in East Africa are, for the large part, a continuation of the land policies that were introduced by European colonial administrations, and adopted by post-colonial governments in the second half of the 20th century. These policies and laws were based on a European perception of land: as a privately owned and controlled source of wealth for individuals. Little notice was taken of alternative perspectives such as rights to land being based on stewardship for future generations, on cultural identity, or membership within a social group (see Box 7.3 for some perceptions on land). Rather than integrating existing customary perceptions of land ownership and stewardship into policy and law, legislation has promoted modern systems of land ownership, privatisation, and exclusivity. The result in practice is multiple co-existing systems of tenure, reflecting the current reality and perceptions of rural users, governments and private investors.

Box 7.3 Perceptions of land

"To us in Africa land was always recognised as belonging to the community. Each individual within our society had a right to the use of land, because otherwise he could not earn his living and one cannot have the right to life without having the right to some means of maintaining it. But the African's right to land was simply the right to use it: he had no other right to it, nor did it occur to him to try and claim one. " **President Nyerere, Ujamaa: The Basis of African Socialism**

"The owner of land owns everything up to the sky and to the centre of the earth". **English common law**

"Land belongs to a vast family of which many are dead, few are living and countless members are still unborn". **Nigerian Chief, quoted in J.C.D Lawrence, The Report of the Mission on Land Consolidation and Registration in Kenya, London, 1966**

The promotion of private land tenure as a means of managing rangelands and reducing environmental degradation has had particularly negative impacts on pastoralists. Many government authorities believe that communal land tenure means that land belongs to everybody, and discourages either investment or sustainable use of resources. In the absence of private ownership there is a perception that pastoralists do not limit livestock numbers resulting in natural resource degradation and livestock mortality.

'The tragedy of the commons'

While the idea that pastoralists make inefficient use of rangelands has been proposed from the early days of colonial occupation of East Africa, this perception of the pastoralist as an irrational and irresponsible manager of the commons was reinforced in 1968 by an American researcher called Garett Hardin. Hardin (an American ecologist who warned of the dangers of over-population) wrote an article for Science (a very prestigious, peer-reviewed journal) called the Tragedy of the Commons. Hardin wrote this article to highlight the potential dangers a rapidly rising population posed to the finite resources of the planet. In his thesis, Hardin concluded that human beings have a natural disposition to seek immediate profits for themselves as individuals, and that this was a major obstacle for ensuring the sustainable management of the Earth's natural resources. His conclusion was that global population growth would have to be controlled.

Box 7.4 Definition of common property resources

Common property resources are public goods which are used simultaneously or sequentially by different users because of difficulties in claiming or enforcing exclusive rights, or because they are so sparse or uncertain that it is not worth doing so (Ostrom 1990:30).

In contrast to open access resources, common property resources are governed by institutions who claim ownership and management rights over the resources in question on behalf of a known group. These rights include, in particular, the right to deny access to those who do not belong to the community (Bromley & Cernea 1989), and to regulate the exploitation of the resource by members (Toulmin & uan 2000). Common property systems generally include all community based or customary resource management systems.

Hardin used the example of an African herdsman to illustrate his theory, the `tragedy of the commons', describing a scenario of a fictional pasture, `open to all':

"As a rational being, each herdsman seeks to maximise his gain... The rational outcome is for an individual herdsman to add to his herd as many livestock as he is able to, and for each and every other herdsman to do the same. Therein is the tragedy. Each man is locked into a system that compels him to increase his herd without limit."

In practice, however, Hardin's theory cannot be applied easily to actual pastoral systems for a number of reasons:

No account is taken of herd dynamics	In Chapter 4 we learned that herd size is limited by many factors including: seasonal variability in pasture, affecting herd productivity and calf mortality; the impacts of occasional shocks (disease, cattle raiding) slowing the natural rate of herd growth.
No account is taken of mobility	In Hardin's example, it seems that the pastoral system is closed and livestock can't leave. In reality, when the quality and quantity of pastures decline pastoralists move their animals to other areas. Mobility allows livestock to disperse over a wide area using pastures when and where they exist.
No account is taken of the dynamics of natural pastures	In Hardin's example, one gets the impression pastures are a fixed stock of biomass, which disappears forever once eaten. There is no indication in the article that pastures change from one season to the next, just as herd size can fluctuate from one season to the next. In practice, grasses have an annual growth cycle and have complex growth and reproduction dynamics. The situation that Hardin describes is similar to pastoralists' experience in the dry season when there is a fixed stock of biomass until the next rains. Livestock, however, cannot destroy this stock, as it is already dead or dormant. In addition, it is important that this biomass is consumed before the next rains to allow new growth to sprout.
No account is taken of rules of accces and management.	In Hardin's example, pastoralists can enter the rangeland without asking permission from anyone. The text mentions that pastures are 'open to all'. In practice, customary pastoral systems have complex rules of access to, and management of, natural resources based on a number of principles: reciprocity, priority but not exclusive rights, negotiation.
The pastoralist is alone and isolated in his decision.	In Hardin's example, the pastoralist appears to be completely isolated, having no contact with the other pastoralists, herding their livestock with his family or the broader community. There does not appear to be any social or cultural relations. In practice, pastoralists have families and live in broader communities (clans, etc.) with complex social, cultural, political and economic rules regulating their lives. A herder is, thus, not an isolated individual without any social contacts. Yet Hardin's article argues that herders are selfish and do not communicate with anyone. This vision contradicts the beginning of the article where he says that after many years of war, peace had returned to the region, which supposes that the community did in effect communicate with each other.

'Open access' to natural resources can undoubtedly result in a 'tragedy of the commons' – e.g. the over-fishing of the oceans, the global rise in temperature due to carbon emissions. However, pastoral lands have traditionally not been open access, but 'common property resources' (Box 7.4) – land that belongs to a defined group with rules governing access and resource use, and institutions responsible for the management of the land.

Box 7.5 Key points – tragedy of the commons

- Pastoralists are often seen as irrational, being incapable of managing resources under common property regimes due to the 'tragedy of the commons'.
- Functioning pastoral systems are NOT open access and do have complex systems and rules for regulating access and use of resources.
- The tragedy of the commons argument applies to open access resources and NOT to common property resources that are subject to complex negotiated management systems.
- Open access to natural resources can result in a 'tragedy of the commons'.
- Hardin's article continues to influence government and donor policy.

Many colonial and independent governments, believing pastoral lands to be open access with no limits to resource exploitation, pursued policies of nationalisation or privatisation of pastoral lands and land-based resources. These policies significantly undermined existing pastoral institutions that were regulating access to land and land-based resources. Government inability subsequently to enforce their own policies in the pastoral rangelands, often for lack of resources, has resulted in a governance vacuum thereby creating the very tragedy they were trying to prevent.

7.2.2 Economic policy

Chapter 6 described the economic importance of pastoralism, both to local and national economies.

The livestock sector in the developing world is growing at a rate of up to 7 per cent per annum. There has been rapid increase in demand for livestock products in developing countries, due to population growth, urbanisation and income growth.

Box 7.6 Rising global demand for livestock products

Meat consumption in developing countries increased by more than three times the increase in developed countries from the early 1970s to the mid-1990s, and growth in demand for meat is predicted to be much higher than growth in cereal consumption in future.

In Ethiopia, there has been a huge growth in the formal export of livestock in recent years (Table 7.1). This export trade is closely tied into pastoralists areas as it is these areas that are the main source of livestock for export.

Table 7.1: Formal live animal and meat exports from Ethiopia, 2005-2013 (reproduced from Aklilu and Catley 2014, source data from National Bank of Ethiopia)

	Live animals		Meat	
Year	Number	Value (US$1,000)	Amount (tons)	Value (US$1,000)
2005/06	163,000	27,259	7,717	15,598
2006/07	234,000	36,507	7,917	18,448
2007/08	298,000	40,865	5,875	15,471
2008/09	150,000	77,350	6,400	24,480
2009/10	334,000	91,000	10,000	34,000
2010/11	472,000	148,000	16,877	63,200
2011/12	800,000	207,100	17,800	78,800
2012/13	680,000	150,000	16,500	68,000

This 'livestock revolution' means that there is good potential for pastoralism and livestock production in Ethiopia to play an even greater role in the national economy in the future. National policies to support livestock marketing, as well as pastoralism as a production system, will be very important if Ethiopian livestock keepers are to benefit from this increased demand.

Data from studies across pastoral areas in Ethiopia show that more animals are offered at markets than are actually sold (Figure 7.1). A recent study by ILRI found market access made a significant difference in the average number of sales per livestock keeper as a percentage of their herd: livestock keepers with easy access to markets would sell 17 per cent of their herd compared to 7 per cent for those with poor access to markets. Poor market access and intermittent international livestock import bans due to inadequate vaccination programmes and disease monitoring and control are both examples of current market inefficiencies.

Figure 7.1: Proportion of livestock offered for sale and sold at market. Data collected at three markets on weekly basis from June-Nov 2007: average livestock sales as percentage of livestock offered. Source: ACDI/VOCA Pastoralist Livelihoods Initiative: Livestock Market Monitoring Bulletin Weekly Bulletins: June-Nov 2007

Constraints to livestock marketing in Ethiopia exist from the supply side as well as the demand side of the market, and include:

- Differences between traders' requirements (species, breed etc.) and pastoralist preferences for selling. We have seen in Chapter 4 that pastoralists will sell livestock with the intention of maintaining a specific species/age/configuration that suits their particular household economy and herd structure at the time. This may not match the demands of the traders.
- Market information inefficiencies - pastoralists often have price information and may be reluctant to accept below-market prices.
- Seasonal variation in quality – pastoralists may wait to sell, offering animals that are older or in poorer condition than the market requires.
- Lack of financial institutions (MFIs and co-operative banks) (see the conversation between the bank manager and pastoralist in Box 7.7 below), reducing access to capital and collateral. For example, the Oromiya Co-op Bank does not reach pastoral areas; Regional Governments guarantee farmers' loans for fertilizer but don't do the same thing for pastoralists. Such credit is necessary at all points of the supply chain – for example, providing financial support to allow herders to vaccinate, or for `middle market' traders to buy locally and transport livestock to larger markets.
- Absence of proper facilities/infrastructure for keeping, transporting, and slaughtering livestock and livestock products.
- Weak local and regional demand, especially for large stock.
- Poor quality animals – local breeds may be very drought resistant but not good for markets.
- Poor transport and poor roads/infrastructure.

- Poor responses to export bans/livestock disease. Vaccination requirements, required by importers to provide adequate health and safety along the food supply chain are not in place to reassure importers, due to inadequate, underfunded, lack of centralised veterinary services.
- Difficulties of ensuring stable demand (within and between years) in context of fluctuating supply because of seasonality and drought.
- Difficulties of ensuring stable supply. Traders may not understand fluctuations due to seasonal and annual variations in livestock mortality, and other productivity factors. There are significant seasonal variations in the supply of livestock to markets, particularly cattle and camels.

Recent policy initiatives (e.g. NEPAD, the Commission for Africa) highlight the importance for Africa to capitalise on its livestock wealth through improved livestock development and marketing.

Box 7.7 Conversation with a bank manager: a drama in one act...

Pastoralist: I own 53 camels, 25 cattle and around 70 goats and sheep. Can I get a loan with my animals as collateral?
Bank Manager: No
Pastoralist: Why not?
Bank Manager: You might take your animals across the border and never come back again. You must understand that the bank's money is somebody else's life savings.
Pastoralist: But I also have a Toyota Land Cruiser. Can I have a loan with my car as collateral?
Bank Manager: Yes, that's possible
Pastoralist: But what will happen if I drive off to Kenya in my car and never come back?
Bank Manager: Hmmm... I guess that would be the bank's loss.
Pastoralist: I don't understand. What's the difference between crossing the border with a camel and crossing the border with a car?
Bank Manager: ...uuummmm.....
Pastoralist: So it's the same?
Bank Manager: As per our bank's procedural manual it is not possible to give you a loan with your animals as collateral.
Pastoralist: What does the manual actually say about giving loans to pastoralists like me?
Bank Manager: Nothing.

Source: Pastoralist Concern Ethiopia and Save the Children USA, 2006. On the Move: Understanding pastoralism in Ethiopia

For example, the PASDEP/ GTP has specific objectives relating to livestock marketing:

- "Facilitating local and cross-border livestock trading, with better market information, credit provision and certification for quarantine; restoring the stock/feeder programme through private or livestock cooperatives; and promotion of 'commercialisation' of livestock production objectives."
- "Establishment of MFIs that is tailored according to the pastoralists' nature and character to support pastoral activities in trading as well as livestock."

The challenge is to respond in a way that recognises and supports the logic of pastoralism as a production system. For example, implementation of policies must allow for mobility rather than constrain it.

Furthermore, research shows that it is primarily the wealthiest pastoralists that are most engaged in the marketing of livestock at a regional level, and make the most gains from policies that support trade. Policies to support and improve marketing should not be at the expense of those that support livestock productivity for poorest families who benefit from livestock services (food, savings and insurance, social capital, etc.) as much as or more than as a source of income.

Box 7.8 Key policy areas that impact on livestock marketing

- Infrastructure and transport – investment in roads and improved accessibility.
- Investment and provision of veterinary services.
- Taxation
- Linkages and communication between all stakeholders
- Credit and financing
- Payment flows
- Capacity building: business skills
- Quality improvements

7.2.3 Livestock health policy

Until the recent PASDEP and GTP period, animal health policy or strategy in Ethiopia was to provide services throughout the country in fixed public veterinary clinics. Three types of animal health personnel (Veterinarian, Animal Health Assistant (AHA), and Animal Health Technician (AHT) were permitted to work in the veterinary profession. These services are organised as federal (within the Ministry of Agriculture) and regional services.

Federal animal health services are responsible for strategic direction, formulating policies and strategies, legislation and certification, national level issues of disease prevention and control, particularly relating to trade-sensitive disease, and provide a central animal health information system.

The role of the regional and state animal health services are fivefold:

1. Provision of preventive and clinical services
2. Conduct vaccination programmes
3. Provide diagnostic services
4. Infrastructure development
5. Procurement.

Licensing private practitioners - through woreda clinics – vets, AHAs and AHT and Animal health posts (sub-woreda clinics) – AHTs.

In practice, public clinics are located in major towns, far from the livestock and livestock keepers that require their services, and it is estimated that less than 30 per cent of the livestock population is served. This is due to inadequate budgeting, a shortage of staff and limited staff mobility. As a result, endemic diseases still cause huge livestock losses and low productivity and disease reporting is very low.

Community animal health workers (CAHWs) are one solution that has been successfully piloted in Afar and elsewhere in Ethiopia and has finally been endorsed by the government. CAHWs are community members who have received basic, non-formal training in animal healthcare and who prevent and treat animal diseases within their

communities. CAHW work focuses on simple treatable diseases such as internal and external parasites and infections which respond to antibiotics and trypanocides. The veterinary establishment does not pay them; they are supported through their own activities. In spite of early concerns about the ability of CAHWs to properly administer veterinary drugs and diagnose livestock diseases, surveys show they have the confidence of livestock keepers and are providing much needed services at an affordable cost.

The advantages of CAHW for pastoralist areas are fourfold:

- **Accessibility:** The problem of physical access to livestock particularly challenging during the rainy season or in areas affected by conflict. CAHWs live in the same community as their clients, where they are usually readily accessible when needed. Treating sick livestock in places rather than having to transport them to centres, reduces the risk of disease spread as well as increases effectiveness as treatment can be provided so much more quickly.
- **Technical appropriateness:** CAHWs can handle basic healthcare problems; CAHWs can offer preventive or curative services for problems such as internal and external parasitism, other infectious diseases and various other ailments. These workers can also vaccinate animals against anthrax, pasteurellosis, BQ and offer castration, dehorning and similar services.
- **Affordability:** CAHWs are usually part-time workers who also make a living from rearing livestock.
- **Accountability:** pastoralists feel a greater sense of control and accountability with CAHWs whom they have had a say in selecting, as compared to most government personnel.

The value of CAHW has been particularly well-demonstrated in the vaccination campaigns to eradicate rinderpest, where CAHW were able to vaccinate more than 85 per cent of livestock using a heat-stable vaccination that did not require refrigeration.

Figure 7.2: CAHWs are community members who have received basic, non-formal training in animal healthcare and who prevent and treat animal diseases within their communities

The PASDEP/GTP has endorsed CAHWs as "strengthening field veterinary services through increasing the number of veterinary clinics from 1,587 to 3,600, mobile service delivery units and deployment of trained community animal health workers", and also sets a target of 100 mobile animal health facilities.

In addition to this, PASDEP includes within its stated goals, better control of major trans-boundary animal diseases, Livestock early warning system in pastoral areas, and research on newly emerging unknown diseases.

Still, concerns remain with respect to the shift towards a more decentralised animal health care system, working through community members, specifically:

- Governance of CAH system: veterinary services need to develop objective and transparent systems for the accreditation, certification monitoring and supervision of CAHWs.
- A need to review legislation: the policy gap is lack of definition, roles, regulation and supervision of CAHWs. Need to be defined in veterinary legislation.
- Need of coherence with existing public and private veterinary service delivery system
- Continuing support to subsidised systems for veterinary drugs
- Lack of proper and regular supervision and monitoring system

- Absence of certification
- Regular review of national guidelines, curriculum, licensing and monitoring procedures
- Inadequate private practitioners in remote areas.

Box 7.9 Key points – animal health

- National level policymakers recognise the need for support to decentralised veterinary services provision.
- Community Animal Health Workers (CAHW), a more extensive network of veterinary clinics and mobile service delivery units, and better disease monitoring and early warning systems are key solutions being implemented under the PASDEP and GTP.
- Challenges remain to ensure a quality of service, coherence of service delivery, and support/subsidies to CAHW working in remote low-population areas.

Education policy as it relates to pastoralists

There is a rising demand for pastoralists' education and innovative education in pastoralist areas (Krätli and Dyer 2009). There are demands for mobile-based education systems or schools that allow children directly involved in pastoral livestock production to also receive schooling. Pastoralists' access to education is low relative to non-pastoral populations, partly because conventional school-based systems are not compatible with pastoralist lifestyles (Siele et al. 2013). Experiences in Kenya show that distance learning through the use of radio is a potentially flexible and worthwhile option (Siele et al. 2013). Other examples include, mobile community-based teachers, and community boarding schools.

Many of these initiatives are currently based through NGOs with limited support from governments. This can results in overall quality problems and high costs for parents and communities to bear. Government policies on education need to recognise mobile pastoral societies and cater for their eduational needs, as well as for those under more conventional school-based systems.

Education provides a long term investment for improved pastoral representation, better intergation of pastoralists in national policy making, and in being able to seize business opportunities.

References and further reading

Aklilu, Y., and Catley, A. 2014. Pastoral livestock trade and growth in Ethiopia. Future Agricultures Policy Brief 72.
www.future-agricultures.org/policy-engagement/policy briefs/1880-pastoral-livestock-trade-and- growth-in-ethiopia/file

AU 2010. Policy framework for pastoralism in Africa: securing, protecting and improving the lives, livelihoods and rights of pastoralist communities. Department of Rural Economy and Agriculture, African Union Commission. Addis Ababa, Ethiopia.
http://rea.au.int/en/sites/default/files/Policy%20Framework%20for%20Pastoralism.pdf

Bromley, D. W., and Cernea, M.M. 1989. The management of common property natural resources: Some conceptual and operational fallacies (Vol. 57). World Bank Publications.

Cotula, L., Vermeulen, S., Leonard, R., and Keeley, J. 2009. Land grab or development opportunity? Agricultural investment and international Land deals in Africa. London/Rome: IIED/FAO/IFAD.
https://dlc.dlib.indiana.edu/dlc/bitstream/handle/10535/6178/land%20grab%20or%20dev%20opportunity.pdf?sequence=1

Fratkin, E., 2014. Ethiopia's pastoralist policies: Development, displacement and resettlement. Nomadic Peoples, 18, 94-114.

Hardin, G. 1968. The tragedy of the commons. Science, 162, 1243–1248.

Toulmin, C. and uan, J. (Edts). 2000. Evolving land rights, policy and tenure in Africa. DFID/IIED/NRI, London.

Krätli, S., and C. Dyer. 2009. Mobile Pastoralists and Education: Strategic Options. Education for Nomads Working Paper 1. London: IIED.
http://pubs.iied.org/ 10021IIED.html

MoFED 2003.Rural Development Policy and Strategies (RDPS). Addis Ababa, Ethiopia.
MoFED. 2006. Ethiopia: Building on Progress – A plan for Accelerated and Sustained Development to End Poverty (PASDEP) (2005/06 – 2009/10). Addis Ababa, Ethiopia. Ministry of Finance and Economic Development

www.afdb.org/fileadmin/uploads/afdb/Documents/Policy-Documents/ Plan_for_ Accelerated _and_Sustained_%28PASDEP%29_final_July_2007_Volume_I_3.pdf

Mulatu, A. and S. Bekure 2013. The Need to Strengthen Land Laws in Ethiopia to Protect Pastoral Rights. In Pastoralism and Development in Africa: Dynamic Change at the Margins, ed. A. Catley, J. Lind and I. Scoones. Routledge, Abingdon and New York, pp. 186-194.

MoFED. 2010. Growth and Transformation Plan (GTP)2010/11 – 2014/15. Vol 1. Addis Ababa, Ethiopia. Ministry of Finance and Economic Development.
www.ethiopians.com/Ethiopia_GTP_2015.pdf

Ostrom, E. 1990. Governing the commons: the evolution of institutions for collective action. Cambridge: Cambridge University Press.

Pastoralist Concern Ethiopia and Save the Children 2006. On the Move: Understanding pastoralism in Ethiopia.

Siele, D., Swift, J., and Krätli, S. 2013. Reaching pastoralists with formal education: a distance-learning strategy for Kenya. In: Andy Catley, Jeremy Lind, and Ian Scoones (eds.), Pastoralism and Development in Africa: dynamic change at the margins. Abingdon and New York: Routledge

Wellard-Dyer, K. 2012. CAADP Policy Brief 06. Pastoralism in the Horn of Africa: Diverse livelihood pathways. Future Agricultures Consortium.
www.future-agricultures.org/policy-engagement/policy-briefs/1531-pastoralism-in-the-horn-of-africa-diverse-livelihood-pathways/file

8. Challenges and prospects of pastoralism

Summary

This chapter looks at the constraints and opportunities currently facing pastoralism, and what these might mean for the sustainability and future of pastoral systems:

- There are a number of constraints facing pastoral systems including population growth, policy and market challenges, changing land uses, increasing inequalities, insecurity and conflict.
- Despite these constraints, there are a number of opportunities for pastoralism to remain a viable livelihood and land use system. These include; more supportive frameworks and policies towards pastoralism, a growing pastoral political presence and civil society movement, greater use of technology, enhanced diversification and innovative livelihood strategies, increasing education, and more demand and market opportunities for livestock.
- Climate change is both a constraint and opportunity for pastoralism. It is argued that pastoralists are well positioned to adapt to climate change and already utilise a number of strategies to respond to climate variability.
- There are a number of gaps to address to ensure pastoralism as a viable livelihood. These include, securing mobility and equitable access to land, supportive development and national policies, capacity building, expansion of trade and the empowerment of women.
- The possible futures of pastoralism in Ethiopia and The Horn of Africa are diverse and will depend on the particular physical, economic, political and social context and demands placed on pastoralists. Some will continue to maintain a livelihood based on mobile livestock keeping, whilst others will drop out of pastoralism and seek alternative livelihoods. Others might tap into opportunities for commercialisation and trade, and engage in value-added activities. It is likely a combination of activities will emerge which allow diverse livestock and non-livestock based activities to support and complement one another, to strengthen livelihoods in pastoral areas.

Brainstorming questions

1) What is the role of investment and business in the future of pastoralism?
2) What are some of the ways to improve the representation of pastoralists at state and regional levels?
3) What are some of pastoralists' adaptation strategies to climate change?
4) How do you better foster women in community leadership in pastoral areas?
5) What is the role of education in the future of pastoralism?

8.1 Overview

This book has shown how pastoralism as a production system makes productive and rational use of a natural environment that is inherently variable and unpredictable.

We have learnt how extensive pastoral production contributes significant amounts to the national economy of Ethiopia, as well as other countries in The Horn of Africa, with a livestock and meat trade valued at US$1 billion for The Horn of Africa in 2010. Pastoralism supports 30 million livelihoods in The Horn, and provides a diverse set of economic, cultural and social benefits. Mobile livestock production makes productive use of the arid and semi-arid lands, and livestock are able to make efficient use of scarce rangeland resources, feeding burgeoning human populations and conserving rangeland biodiversity in the process.

Despite these considerable benefits, governments still consider pastoralism an environmentally destructive and irrational land use. Pastoralists are considered archaic, traditional, and irrational in their desire to keep many livestock. Much of the headlines and media portrayal of pastoral land is that of poverty, food insecurity and land grabs (IIED 2013).

Yet, pastoralism is showing remarkable vitality, and in the last decade research has shown a much more nuanced picture of pastoral systems. This portrait shows pastoralists as fluid and dynamic, and continually adapting to constraints and opportunities

in their political, economic and climatic environments to market demands and opportunities, and pastoralists are innovating and finding new ways to harness the variability and uncertainty in their environments (Krätli 2015).

Here we outline some of the main constraints and opportunities currently facing pastoralism.

8.2 Constraints

Pastoral systems currently face a number of challenges including population growth, urbanisation, changing land uses, globalisation, and increasing insecurity and conflict. These are discussed, although not exhaustively, in the list below:

- **Growing populations**. Population growth, pastoral towns and settlements are expanding; but while human populations are growing, livestock population numbers are remaining relatively stable. This is resulting in fewer livestock per capita. The increasing need to grow crops to feed the growing numbers of people makes it difficult to keep rangelands open for livestock. This is restricting mobility. It is also causing pastoral economies to be less self-sufficient.
- **Gender inequality.** The exclusion of women's voices in decision- making at various levels of a pastoral society.
- **Market constraints.** These include high transaction costs, high market taxes and transit fees, poor access to high–value export markets. Pastoralists are vulnerable to low prices especially if livestock lose condition on the way to market.
- **Policy challenges.** Policy promotes cropping over pastoralism, turning rangelands to crops and herders to farmers. It is assumed that crop farming is a better way to develop pastoral lands. However, keeping land under common property tenure regimes so livestock can be mobile, especially in the context of climate change, can improve the success and sustainability of production. Governments seek to replace pastoralism with alternative land uses to raise taxes and exert greater economic and political control in rangeland areas (Behnke and Kerven 2013). There is also the continual assumption that to develop is to intensify production to western style ranching or diary systems. However, constraints

such as low and irregular rainfall, recurrent drought, poor soils and limited veterinary and agricultural inputs limit this. Government policies continue to encourage pastoralists to sedentarise – for administration and taxation purposes, provision of services, such as health and education.

- **Large-scale land use change and loss of rangelands.** This amplifies the impact of drought and climate change, and can be particularly severe if key resource areas such as wetlands are targeted and removed (Scoones 1992). Ethiopia's current economic plans include the extensive development of riverine areas for large scale agriculture or large dams for hydroelectric power, involving the relocation and resettlement of pastoralist and agro-pastoralist populations away from rivers (Fratkin 2014).
- **Increasing inequalities.** There is an increasing gap between those that own livestock and those that herd livestock, resulting in an increasing concentration of livestock with wealthy absentee owners, and fewer with rural poor herders. Those left behind are marginalised and not well represented. Similarly, there is a growing gap between those that are able to access and profit from increasing market opportunities and those that are not. Those that are not may have to drop out of pastoralism, find new livelihoods, or rely on aid. The more wealthy pastoralists are buying fodder and supplementary feed, buying and trucking in water, and fencing off private areas for their personal use to make up for reduced pastures.
- **Insecurity and conflict.** Pastoralists' reliance on mobility makes them more vulnerable to conflict. This can cut off access to key resources and block them from routes to reach markets. Insecurity and conflict is creating fear and loss of life and livestock, and this is made worse by the spread of small arms and other weaponry into the region.
- **Poor governance and corruption**. Traditional institutions are less and less effective. Pastoralists suffer from poor representation. Distributional issues such as those caused by elite misappropriating funds, negatively impact pastoral populations.

8.3 Opportunities

Despite these constraints, pastoralism is continuing to thrive, and there are a number of opportunities for pastoralism to remain a viable livelihood and land use system in Ethiopia and beyond.

- The **African Union has a pastoral policy framework that is supportive** of pastoralism including livestock mobility within and between countries. It recognises pastoralists' economic, social and cultural contributions, historically and in the future. National governments need to design policy and pass legislation to enact the AU's policy framework.
- **The overall policy environment in Ethiopia is becoming more positive to pastoralism:** The Constitution includes the protection of pastoralists' land rights; development policies recognise pastoralism as a livelihood system and have provisions to improve pastoral development; and regional states are beginning to formulate their own land use and administration policies that are more in favour of pastoralism. However there are still gaps to addresss if these are to become effective.
- There is greater prominence of pastoralism within formal government institutions, and a **growing pastoral political presence**. For example, the Ethiopian Pastoral Affairs Standing Committee plays an important role in raising the awareness of pastoral issues and has influenced the establishment of pastoralists departments, committees and groups within various ministries (Morton et al. 2007). These include the establishment of the Pastoral Development Department in the Minsitry of Federal Affairs and Pastoral Commissions at the regional level. These show a greater commitment by the government of Ethiopia towards the development of pastoralists areas.
- There is a strong and emerging **pastoral civil society movement** in the region raising pastoralist issues at the national level. For example, the annual National Pastoralist Day in Ethiopia helps to raise awareness about pastoralist issues, brings a collective voice in favour of pastoralism, and encourages advocacy. Also, the proliferation of pastoral NGOs is helping build capacity of pastoralists and makes important contribution to employment in pastoral areas.

- Pastoralists are constantly innovating, **modernising, and working with technology.** Mobile phones are commonly used by pastoralist across Africa to check on pasture and water conditons, to compare market prices, to monitor livestock health, to avoid wildlife areas, and to recover stolen or raided cattle (Butt 2015). Moreover, additional features such as mobile banking, e.g. Safaricom's MPESA in Kenya, allow pastoralists to easily exchange and transfer money in rural areas where traditonal banking infrastructure can be absent. Development and private sector innovations are offering drought insurance schemes, pastoral credit provision and loans. Pastoralists use motorbikes to follow their herds, connect to markets, and tax people around as a source of income.
- Pastoralist are **diversifying their herds to cope with restricted mobility** and increasing droughts. For example, by keeping indigenous breeds best adapted to drought, and by keeping increasing goats and camels that browse trees and bushes.
- Pastoralists are **diversifying their incomes and engaging in new activities.** This is helping to supplement livestock-based incomes and reduce risk. Wealthier households are likely to diversify out of choice to engage in new business and investment opportunities. However, poorer households are more likey to diversify out of necessity to manage risk and seek alternative work in order to survive (Little et al. 2001). Some pastoralists are migrating out of pastoral area for wage labour in towns and cities and sending back remittances –these are helping support the pastoral family to buy food, livestock etc.
- Pastoralists are **innovating and responding to new market opportunities** in dynamic ways. Livestock markets in The Horn of Africa are huge with significant national, regional and export trade going on. Pastoralists are responding to new market demands and changing consumer preferences, e.g. to the growing demand for camel milk in urban areas (Abdullahi et al. 2013) and to new internatioinal camel milk markets.
- Pastoralists are **increasingly educated,** going to university, and getting more skilled jobs. This is increasing opportunities for new employment and diversification, and for getting involved in national political processes. Also, more girls are going to school and becoming educated and getting jobs. Education systems are being developed for nomadic pastoralists to allow children directly involved in pastoral production to simultaneously acquire a formal education (Siele et al.2013).

- The Livestock Revolution is ongoing and **fuelling an increased demand for livestock** and livestock products in Africa, Asia and South America. It is mainly pastoralists who will meet this demand.
- Many NGOs and donors are increasingly supporting development activities in pastoral areas of Ethiopia, such as in basic service provision, policy and advocacy, research and community empowerment.

8.4 Climate change – a constraint and an opportunity

Climate is becoming more variable and less predictable. Climate change is expected to increase the frequency and severity of droughts and floods in the region. Recurrent droughts, increased floods events, and highly variable rainy seasons are currently being observed.

Climate change can be considered both a constraint and an opportunity to pastoralism. If pastures and water sources dry up, pastoralists can lose their livelihoods, or severe floods can wipe out entire herds that are already suffering from a previous drought. However, pastoralists are better able to adapt to climate change than those tied to sedentary land uses. Pastoralists already have strategies that allow them respond to variable climatic conditions, using mobility and reciprocity to access variable resource. Thus, pastoralists that are mobile are well positioned to adapt to climate change.

For sound policy it will be important to have a good understanding of these strategies, in the context of increasing climate variability, land use changes, and growing populations.

Pastoralists' capacity to adapt to climate change will thus depend on policies that are supportive of mobility and that secure pastoralists land rights. If pastoral strategies of adaptation are supported, productive use of the lowlands can continue. However, if pastoral strategies of adaptation are not supported, climate change could result in increased poverty, environmental degradation and conflict. Climate change thus offers both opportunities and threats to pastoralists.

Furthermore, grasslands large capacity to store carbon means that pastoralism has an important value in mitigating the impact of climate change (FAO 2010). The carbon sequestration capability of grasslands can be as great as or greater than that of cropland, offering great potential for pastoral rangelands to mitigate climate change.

8.5 Gaps

To ensure pastoralism as a viable livelihood, the following gaps need to be addressed:

- **Securing mobility.** Pastoralist need secure access to resources, to pasture and water, but also access to salt licks, traditional medicines, and sacred sites. Mobility is essential for livestock production, but also to access markets to sell and purchase livestock, thus generating incomes. Mobility is also essential to escape risks, such as due to drought, flood or conflict.
- **Equitable access to land.** Weak recognition of pastoralists' customary rules and practices regarding access and use means that pastoralists' use is often invisible, and land is perceived by outsiders to be 'idle' and thus ripe for conversion. Pastoralists need equitable access to land and secure land-use systems to prevent encroachment of pastures. Stronger local and customary systems will enable pastoralists to negotiate access to key resources, particularly in the dry season.
- **Development and national policy must be supportive of pastoral land use.** There is a need for policies that are inclusive of the needs and constraints of pastoralists. Progressive pastoral policies, such as the AU policy framework, are those that recognise and support innovation and entrepreneurialism in pastoral areas. Complementary policies need to be developed, and governments must provide pastoralists with space and authority for decision-making.

Ethiopia's current government objectives for economic growth and poverty reduction through the commercialisation of the agricultural sector, particularly through irrigation of large agricultural estates in the lowlands, need to be reconciled with the recognition of pastoralist livelihood strategies based on adaptive management (e.g. mobility) in variable environments. Effective policy implementation will require a deepened understanding of pastoralism, the establishment of institutions,

and allocation of sufficient resources.

- **Recognising and working with variability.** Pastoral rangelands are variable systems with climatic variability and uncertainty, which is predicted to increase in future. Pastoralists engage with variability and are best able to cope with it. This variability should be embraced rather than controlled, with policies supporting pastoralists to develop a number of risk-management strategies, keep a portfolio of livelihood options and strengthen their capacity for adaptation (Krätli 2015).
- **Capacity building of pastoralists.** Building the capacity of pastoralists' through education and training programmes can enhance pastoralists' skills and help them diversify their enterprises, take up new employment opportunities, improve their resource management techniques, and enable greater participation in policy-making.
- **Empowerment of women.** Women play a significant role in pastoral societies and are responsible for a number of activities including milking, domestic chores, caring for sick and small livestock, and house building. However, pastoral societies continue to be dominated by men who hold the greater decision - making power. However, women are increasingly involved in new economic opportunities and should be supported to do so. Supporting women's income-generating activities can empower women to take a great role in the community and enhance their socio-economic position. Women need to be supported to access productive resources and gain control of productive assets to strengthen their decision-making power.
- **Pastoralists as partners.** In any new investments in the rangelands, pastoralists need to be at least informed and consulted, but ideally made partners. Investments need to take account of local circumstances and priorities, and pastoralists involved in all stages of a project development.
- **Expansion of trade.** Pastoralists need better integration into markets and the development of domestic markets. This will help to meet the growing demand for animal products worldwide.

8.6 The future of pastoralism in Ethiopia and the Horn of Africa

This book has shown how pastoralists are responding to the opportunities and demands that are placed upon them in their physical, economic, political and social environments. These play out differently in different areas, for different pastoralists and are dependent on a varied and dynamic set of particular influencing factors. As diverse as pastoralism is itself, where pastoralists may keep different numbers and species of livestock, engage with markets at differing levels, and hold varying livelihood diversification strategies, there is no one future of pastoralism. Instead there are diverse and different pathways that pastoralists may take depending on their circumstances and change going on around them (Catley et al. 2013).

In 2006, pastoral leaders, Ethiopian policy makers and development practitioners came together to consider the future of pastoralism in Ethiopia. They considered some of the choices pastoralists may make over the next years to adapt to changing circumstances, taking account of key factors such as climate, natural resources, markets, conflict and governance that will shape the future (UN OCHA-PCI 2007). They envisaged four possible hypothetical futures (Figure 8.1):

1) **Sustaining pastoralism.** Where the natural environment is productive and pastoralists have access to good pasture, and market access is poor, many will maintain a livelihood primarily based on the raising and selling livestock.
2) Added-value diversification. Where pastoralists are under natural resource pressure, but there is strong demand for pastoral products on national and international markets, pastoralists may expand into milk and meat processing, and the export of quality skins and hides.
3) Expanding export trade. Where natural resources are more abundant and pastoralists' gain increasing access to international markets, they may move quickly to scale up the quality of production to take advantage of high prices for animals and animal products abroad.

4) **Alternative livelihoods.** Where resources are scare and livestock markets inaccessible, some pastoralists will need to find alternative liveilhoods, shifting away from pastoralism towards complementary activities such as tourism, education and financial services.

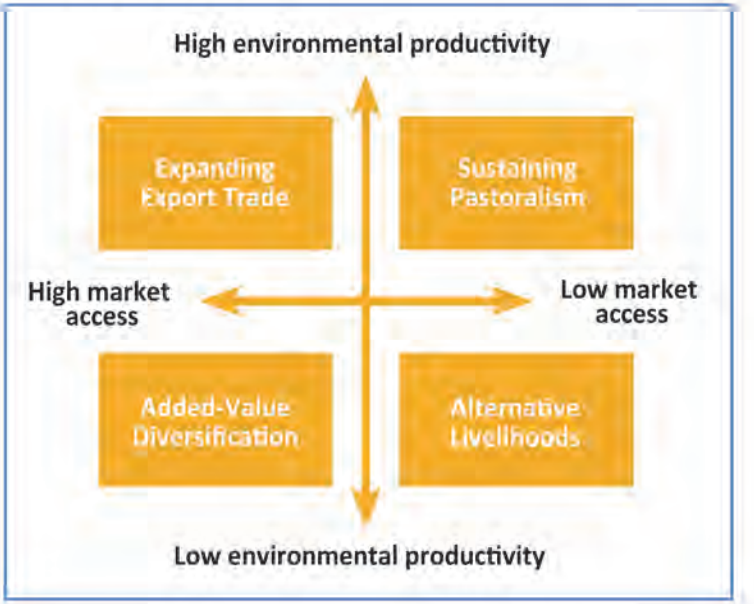


Figure 8.1: Four possible scenarios depicting the future of pastoralism in Ethiopia (UN OCHA-PCI 2007)

All of these scenarios are currently being played out in Ethiopia, and even historically, pastoral societies have shifted between more traditional livestock production systems and diverse, alternative forms of livelihood, and have long been tied into networks of exchange and trade. Today, there is an even greater spread of diverse livelihood pathways that pastoralists are taking, and this is resulting in increasing differentiation (Catley et al. 2013). Those who are unable to tap into the growing opportunities for trade and commercialisation, and are unable to stay in traditional pastoralism, may move out of pastoralism altogether. Those who are able to profit from commercialisation can do well and form the economic and political pastoral elite.

Research shows that pastoralists are increasingly leaving pastoralism. In 11 pastoral sites across southern Ethiopia and northern Kenya, McPeak et al. (2011) found that there were more ex or non-pastoralists than there were active pastoralists. Those exiting pastoralism will need to be supported to find alternative livelihoods and new jobs. If encouraged to get involved in small-scale trading and urban-based market and input services that serve the livestock sector, such as meat-processing plants and fattening operations for export animals, this can help to find the balance to support and assist ex-pastoralists without constraining those who still rely on livestock production. This will also require good rural-urban linkages and good provision of local markets and services. Non-pastoral and more sedentary activities can supplement pastoralists and allow mobile pastoralism to continue. Having a household member in wage employment outside of pastoralism elsewhere is an increasingly important livelihood strategy that can enhance food security and provide capital to reinvest in livestock (McPeak et al. 2011).

Also, as rural populations increase, there is a growing need for rural enterprise and associated service industries – for example in house construction, trade and transport, brewing, hotels and restaurant businesses. There are thus opportunities for more households and individuals in pastoral areas to acquire the skills to respond to these needs.

Others will continue to keep livestock and combine this with other land use and livelihood options. As the growing demand for livestock and livestock products increases, and new markets emerge for export trade and value addition, pastoralists will respond, innovate and adapt to these demands. Indigenous livestock practices are likely to mix with more modern practices, as well as new innovative and entrepreneurial practices and diversification strategies emerging.

It is likely that all four scenarios depicted above will continue to be found in pastoral areas, and a diversity of possible pathways will reflect the diversity of strategies and outcomes currently observed in pastoral systems today. This diversity needs to be recognised and built upon by policymakers and development organisations. Critical is the need for governments and policies to support and recognise the

value of pastoralism as a rational production system. This will require an overall change in the perception and dominant discourse of pastoralism (Catley et al. 2013), away from being irrational, uneconomic and fragile, to one that is flexible, innovative, responsive, and adaptable and able to work with the variability inherent in rangeland areas where other land uses cannot. Although there are ongoing improvements to the integration of pastoralism into policy and national development priorities, there is still much more to be done. This must be facilitated through the continued improvements in the education of pastoralists and better representation of pastoral priorities in decision-making.

References and further reading

Abdullahi, A., Mohammed, S., and Eid, A. 2013. Town Camels and milk villages: the growth of camel milk marketing in the Somali Region of Ethiopia. In: Pastoralism and development in Africa: dynamic change at the margins. Edited by Catley, A., Lind, J., and Scoones, I.

Behnke, R.H., and Kerven, C. 2013. Counting the costs: replacing pastoralism with irrigated agriculture in the Awash Valley, north-eastern Ethiopia. IIED Climate Change Working Paper No. 4.
http://pubs.iied.org/10035IIED.html

Butt, B. 2015. Herding by mobile phone: Technology, social networks and the 'transformation' of pastoral herding in East Africa. Human Ecology, 43(1), 1-14.

Catley, A., Lind, J., and Scoones, I. 2013. Pastoralism and development in Africa: dynamic change at the margins. Abingdon: Earthscan/Routledge.

FAC CAADP 2012. Pastoralism in the Horn of Africa: Diverse livelihood pathways. Future Agricultures. FAC CAADP Policy Brief 06. March 2012.
www.future-agricultures.org/policy-engagement/policy-briefs/1531-pastoralism-in-the-horn-of-africa-diverse-livelihood-pathways/file

FAO 2010. Challenges and opportunities for carbon sequestration in grassland systems. A technical report on grassland management and climate change mitigation. Integrated Crop Management Vol. 9. FAO.
www.fao.org/fileadmin/templates/agphome/documents/climate/AGPC_grassland_web version_19.pdf

Homewood, K. 2008. Ecology of African pastoralist societies. Oxford: James Currey.

IIED. 2013. Following the herd: why pastoralism needs better media coverage. Briefing paper. IIED: London.
http://pubs.iied.org/10039IIED.html

Krätli, S. 2015. Valuing variability: New Perspectives on climate resilient drylands development. IIED. Edited by de Jode, H. http://pubs.iied.org/10128IIED.html

Little, P. D., Smith, K., Cellarius, B. A., Coppock, D. L., and Barrett, C. 2001. Avoiding disaster: diversification and risk management among East African herders. Development and Change, 32(3), 401-433.
http://crsps.net/wpcontent/downloads/Global%20Livestock/Inventoried%207.11/2-2001-4-91.pdf

McPeak, J.G., Little, P.D., and Doss, C.R. 2011. Risk and social change in an African rural economy: livelihoods in pastoralist communities. Taylor and Francis, London.

Morton, J., Livingstone, J.K., and Mussa, M. 2007 Legislators and livestock: Pastoralist parliamentary groups in Ethiopia, Kenya and Uganda. Gatekeeper Series No. 131. IIED: London.
http://pubs.iied.org/14552IIED.html

Scoones, I 1992. Wetlands in drylands: Key resources for agricultural and pastoral production in Africa. IIED Drylands Issue Paper No. 38.
http://pubs.iied.org/7287IIED.html

Siele, D., Swift, J., and Krätli, S. 2013. Reaching pastoralists with formal education: a distance-learning strategy for Kenya. In Pastoralism and development in Africa: dynamic change at the margins. Edited by Catley, A., Lind, J. and Scoones, I. Abingdon: Earthscan/Routledge.

UN OCHA-PCI 2007. The Future of Pastoralism in Ethiopia. Addis Ababa: United Nations Office for the Coordination of Humanitarian Affairs. Pastoralist Communication Initiative.
www.pastoralists.org/policy-and-government/