



“Broken lands: Broken lives?”
Causes, processes and impacts of
land fragmentation in the rangelands
of Ethiopia, Kenya and Uganda
Fiona Flintan 2011

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Causes, processes and impacts of land fragmentation
in the rangelands of Ethiopia, Kenya and Uganda**

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EXECUTIVE SUMMARY

Pastoralism is the most effective production system for the majority of arid and semi-arid areas. It not only feeds the millions who live in these areas but also makes significant contributions to national, regional and international food security, national and regional economies, biodiversity and the environment. Under enabling circumstances this means that pastoralists can build resilience and reduce vulnerability to drought. Pastoralists know that drought will come and it can be overcome.

In the face of predicted climate change pastoralism is likely to prove an even more important and effective land use system. With temperatures likely to rise in the region and rainfall patterns shifting to become shorter and more intense, farming will become more risky. Pastoralism with its ability to utilise a variety of vegetation states and to track often unpredictably distributed resources (grazing, browse, water) across a landscape, makes it highly suitable to these predicted changes in the environment.

However in order for this to happen pastoralism and pastoralists have several requirements. Firstly they require access to key 'reserved' resources at certain times of the year including dry season grazing areas (often found close to rivers). Such resources are a vital part of rangeland use, and their loss threatens the whole pastoral system. Secondly, pastoralists require mobility and access routes to track the spatially and temporally distributed resources, access markets and other functions. Thirdly, appropriate (collective, supportive) community-based institutions and governance systems, in order to manage resources, resolve conflicts and protect the poorer members of the society. And fourthly, assets (livestock being the most important), to be able to manage and control change, and upon which to build and/or diversify their livelihoods.

In the last few years it has become increasingly clear that pastoralists are finding it progressively difficult to deal with drought and overcome what are often 'normal' dry seasons. Though there is some evidence to suggest that such dry seasons have increased in incidence and intensity, pastoralists argue that their vulnerability to drought has grown not because of any such 'natural' increases but because their ability to cope with them has been reduced by human interference. This has resulted in a loss of the natural resource base and reduced mobility of livestock.

As this report will show, a key reason for this is the steady fragmentation of the rangeland and restricted access to key resources in particular dry season grazing areas. If this fragmentation continues the whole pastoral system is likely to collapse, because without access to these key areas, pastoralists are unable to sustain production on the rest of the rangeland.

Ethiopia

Some parts of Ethiopia have been experiencing heightened fragmentation since the 1970s. In particular the development of government and commercial irrigated schemes in the Awash River Basin to a total of 68,800 hectares by 1989, has caused significant ill effects on pastoral systems. Not only have key resources been removed

but water sources have been polluted. In Somali region and Borana it has been water/rangeland development schemes that have compromised pastoralism and opened up areas to in-migration of settlers. In Borana in particular, government or private ranches have fragmented the rangelands together with large population growth suggested as rising from 300,000 in the 1980s to over one million in 2007.

New challenges such as the invasion of *Prosopis juliflora* and other plants or shrubs have also had a significant impact: in Afar it is calculated that over 1 million hectares are now invaded by *Prosopis*. As access to land has become increasingly competitive, the fencing of remaining areas as private enclosures has grown and land/cropping arrangements have developed – often insecure in nature. The privatisation of rangeland resources has occurred in many parts.

In 2009 the Government of Ethiopia launched plans for agricultural investment areas in several regions of the country to a total of 3.7 million hectares. Land already identified and secured in the government ‘land bank’ (or already allocated to investors) includes 409,678 hectares in the Awash River Basin, 180,625 hectares in South Omo, 444,150 hectares in Gambella and 691,984 hectares in Benishangul-Gumuz. The evidence to date suggests that much of this will be in pastoral areas along rivers, and unless appropriate measures are taken risk the restriction of access to (or the complete removal of) key-site grazing areas and water sources.

The experiences of investments already underway suggest that the needs of pastoralists and other rangeland users may not be taken into account within the establishment and development of these schemes unless appropriate measures are taken. Future threats to pastoral livelihoods come from the development of oil and mineral extractions and large water development schemes including the building of dams and the establishment of linked irrigated-agricultural schemes for commercial investors and sedentarised communities (including ex-pastoralists).

Fortunately, there is a growing awareness of the value of pastoralism as an effective livestock production system and its current and potential contribution to national and regional economies. Pastoralists have been able to increase their voice in decision making processes at all levels and such as marketing facilities have improved. The establishment of land policies and legislation by regional governments offer opportunities for addressing many of the insecurities that pastoralists face and the securing of rangeland resources for them. And the importance of planning across a rangeland rather than basing decisions on one or two key resources is being recognised. It remains to be seen to what degree government and communities can for example work with commercial investors to ensure that measures are taken to protect pastoral resources as well as take forward agricultural development.

Kenya

Pastoralists in many parts of Kenya have been experiencing heavy interventions since colonial times when the then government appropriated Maasai lands in particular (resulting in the loss of between 50-70 per cent of their lands). A number of ‘development’ schemes were introduced that encouraged sedentarisation and in-migration of agriculturalists, the gradual privatisation of resources, commercialisation of livestock production, and a breakdown of pastoral systems in many areas. This

included the group ranch system that commenced a process of land use change eventually leading to the carving up of rangelands into individual landholdings: today in Kajiado District only one group ranch remains undivided from an original 52.

Often these divisions were accompanied by corrupt, biased and inequitable land allocations, often to outsiders and/or land speculators but to some powerful, educated pastoralists too. In Laikipia 48 individuals control 40.3% of the land (937,583 hectares) as commercial ranches or conservancies (the latter with an area dedicated to wildlife conservation). Many are held without clear legal title. In addition there are 23 large-scale farms covering 1.48% of Laikipia. The farms are fenced off and rarely provide through migration routes for pastoralists. 27.21% of the land is under small-holder agriculture. Most pastoralists are limited to 13 group ranches in the drier northern parts covering 7.45% of the district. Corruption and bias in land allocations in Kenya has contributed to the displacement of the poorest in particular, and the marginalisation of women. The Government continues to show a lack of interest in resolving the issue, or of providing the Maasai and other groups with any form of support.

Commercial development and irrigation schemes continue to oust pastoralists from their lands and appropriate compensatory measures are rarely provided. Many vital grazing areas have been lost including the Hurri Hills, areas around Lake Naivasha and significant parts of the Tana Delta. Further, the farms pollute water-courses and drain groundwater sources.

Dependence on wildlife as part of tourism development (earning around US\$400 million foreign exchange per year) has meant conservation protectionism that has marginalised pastoralists despite their ability to successfully live with wildlife. Conservancies set up to encourage wildlife tourism that could be combined with other land uses including pastoralism have incurred administrative and management problems, and often prevented pastoralists accessing resources. Encroachment of Parks has increased as grazing lands have reduced and agriculturalists settled up to Park boundaries. Conflicts with and damage by wildlife is increasing. This is proving highly problematic for both pastoralists and wildlife. Other factors such as invasion of lands by such as *Prosopis*, as well as threats from oil and mineral exploration are also affecting mobility and rangeland production.

The 2008/9 drought highlighted the negative impact that land fragmentation is having on pastoralists' vulnerability, resilience and ability to overcome drought resulting in high loss of human life, high livestock losses, and heavy reliance on humanitarian aid which amounted to around US\$4.6 million in six districts, with livestock lost estimated to be a staggering US\$1 billion. Protracted and regular conflicts, in particular in the northern areas result in loss of life as well as revenues when markets are closed and grazing areas become no-go zones. In the shadow of potential climate change and increased resource competition these costs look set to be incurred on a regular basis unless the vulnerability of these groups is reduced.

An active civil society has enabled pastoralists to gain some attention to their cause and several court cases in their favour to gain back lost lands. Many land users (including ranchers, pastoralists and conservationists) are realising the dangers of land fragmentation and reconsolidating small parcels, brokering new agreements and

partnerships, and identifying multi-land use systems. However there is still enormous room for further progress. In addition new development schemes are being planned for many parts of Kenya including the LAPSET (Lamu Port-Southern Sudan-Ethiopia Transport) Corridor which risk opening up pastoral areas with likely increased competition over resources and knock-on negative impacts.

The Government of Kenya has recently introduced a new Land Policy and approved a new Constitution both of which offer greater opportunities for better securing rights to resources for pastoralists in the future. Other positive steps are the establishment of a new Ministry and strategies that are focused on the development of arid lands, including the role of pastoralism, and a programme to spend substantial funds on ASAL development over the next thirty years.

Uganda

In Uganda too, the British colonialists established 'development interventions' and administrative boundaries that undermined if not destroyed, pastoral production systems and divided pastoral groups. The current government seems set on pursuing the sedentarisation of pastoralists through the establishment of ranches, evictions of pastoralists from their lands, forced settlement, restrictions on mobility, biased service provision and by promoting individual landholdings over common property. This is despite the insecure nature of farming in these areas due to erratic rainfall, which is likely to become even more variable with predicted climate change.

An extensive network of protected areas has further limited pastoral production systems and the encroachment of many wildlife areas. In 1996 mineral extraction was taking place over 22,010 sq km of land, and the sector has grown ever since. The further possibilities of mineral discoveries in some parts have led to extensive land-grabbing. In Karamoja the growth in violent conflict and commercialised cattle raiding, aggravated by the often inappropriate responses of government authorities (failing to address the root causes), have resulted in a high level of insecurity in the region. This has disrupted local livelihoods resulted in the highest incidences of poverty in the country despite the great opportunities for extensive livestock production in the area. Other pastoral groups have suffered too and many such as the Bahima in the southern part of Uganda's 'cattle corridor' have experienced one eviction after another as they have tried to find space and resources for themselves and their livestock.

Though some facilitating policies do exist, few local people including pastoralists know about them and regulations and standards are lacking. There is also a lack of understanding about how livelihoods and land uses have changed, what governance systems (if any) are in place and how best pastoralists and other rangeland users can be supported. Pastoralism is still considered archaic and undesirable. There is a poor understanding of the benefits of pastoralism amongst politicians, policy makers and technocrats resulting in little understanding of the policy, legislative and strategy needs for translating policy and broader pastoralist priorities into concrete interventions and outcomes.

Pastoralists are unable to influence decision making processes and in particular those concerned with commercial investment. CSOs and NGOs tend to work in a

fragmented manner with few common strategies. The land tenure system needs to be revised to match the actual ways that land is being used for production including the facilitation of livestock movement. The new draft Land Policy (2011) and forthcoming Rangelands Policy are very positive step towards this and an important starting point for engaging with government on securing rangelands for pastoralists.

Impacts of land fragmentation on pastoralists

In all three countries the rangeland fragmentation that is taking place is having a significant impact on pastoralists and pastoralism. Firstly, it is clear that some pastoralists are benefiting from the process and some are losing out. In general those who benefit are more powerful and have greater assets on hand, which they can use to influence decision makers and land allocations, enclose property, build up herds, and make the most of new livelihood diversification opportunities. Those who have been able to settle on better quality land for example can be positive about their change in lifestyle and greater access to services.

For the poor, the situation has become critical – they are no longer able to access common property resources upon which they relied; competition and conflict over resources is increasing often with loss of life; they are losing control over their lives; and are increasingly vulnerable to crises such as drought. There is a gradual redistribution of livestock from the poor to the rich. This trend explains why pastoral areas can export increasing numbers of livestock but are also characterised by increasing levels of destitution. As a result increasing numbers are dropping out of the pastoral system with few assets and means to survive. The general opinion of pastoralists is that it is not the drought itself that makes them more vulnerable; rather, it is the increasing marginalisation of their drought-response mechanisms, the barriers on their mobility, and the gradual eroding of their asset base.

Secondly, the mechanisms of resilience that have been built up by pastoralists over centuries including adaptive strategies, mutual support and informal safety-net systems, and social/customary organisations and institutions have been challenged by the multiple internal and external factors affecting land use change and fragmentation. New values and practices focusing on the exclusive acquisition of monetary profit-making are conflicting with the egalitarian ‘culture of sharing’ supported by traditional values like solidarity, cooperation, reciprocity and collective wealth.

Customary institutions are struggling to control land fragmentation. Communal directives are ignored and individuals continue to plant crops and put up enclosures. In addition herders who are prevented from accessing grazing areas by community leaders may petition the local government offices and return with formal permission to use the areas. Paying tax on land further legitimises occupation: often pastoralists do not pay tax. This further weakens customary institutions’ authority over management of resources, which is also being challenged by the youth.

New vulnerable groups have emerged as the local resource base and informal safety-nets and social support systems are less able to support community members who lose assets. These include asset-poor households; small stockowners; widows; aged persons; households with limited access to social networks; and families without

working members or too few working members to e.g. collect water from far-off watering points

Little has been done to set up institutions in the vacuum created, so today rangeland management practices are compromised. In this context local institutions for conflict resolution and jurisdiction based on customary law become increasingly ineffective and incapable of solving the current land-related conflicts. Increasing conflict within and between groups further threatens the social cohesion of the pastoral clan society and plays a major role in weakening risk-averting strategies. As good quality grazing lands have reduced, competition has increased over those that are left and these prove to be regular conflict hotspots. Groups who were once allies are now conflicting over land access.

The loss of adaptive management strategies increases production risks not only for individual herd owners, but also for pastoralism as a whole. Without controlling mechanisms and institutions common property will become open access with likely over-exploitation. Land uses incompatible with wildlife are increasing. Though community-based responses to conflict and peace-facilitating activities have had some success, the root cause of land insecurity and continuing loss of access to land and resources is not being addressed: thus 'solutions' are unlikely to be sustainable.

Women and men experience these changes differently. When land tenure is formalised women have not automatically benefited and in some cases have lost out. For example the establishment of group ranches marginalised women in particular. A lack of males in the household due to taking livestock on protracted migration routes, or out-migration to towns to find jobs can have a profound impact on gender relations. Women are often left as 'de facto' heads of their households but without decision making power and a voice in community discussions.

Despite this, it seems that women are better able to make the most of new and opening opportunities. Though workloads have increased, many women are happy to have a more independent income. However, many women and in particular those who have had less exposure to alternative lifestyles and perhaps led a more 'traditional' life, feel highly insecure about the future.

Recommendations

1. An increased awareness and understanding among development actors of the causes, trends and impacts of rangeland fragmentation is required to enable more informed decisions about how best to slow and prevent such fragmentation and how best to deal with its negative consequences.
2. A better understanding and recognition of the benefits of pastoral systems is required by policy makers to ensure that appropriate support is provided to enable pastoralism to grow and better contribute to national development processes. This should include support to enable it to further adapt to new challenges such as climate change as it is likely that pastoralism can play a greater role in future dryland development than other land use systems. Investment of resources in better securing pastoral systems including rights

to land and resources, can be more cost effective than spending millions on food aid.

3. Development and land use planning in the rangelands needs to occur at a more appropriate scale that can better take into account the different parts of the rangeland system and the requirements of pastoralists as well as other rangeland users. The impact of changing one part of the rangeland system on the rest of the whole needs to be understood and any negative impacts mitigated. The process should start with understanding current land use systems that already exist.
4. Protection and securing of stronger rights to land and resources and such as (serviced) migration routes for pastoralists are needed. This is fundamental if pastoralism is to survive as the effective production system that it is and/or has potential to be. National governments, donors, the African Union and regional bodies, NGOs/CSOs, pastoral local leaders and communities can all play a role in this. The process should start with understanding current land/resource tenure systems and the gaps within these.
5. Awareness raising on land issues, rights that already exist and how to access them; gain protection for them; and to influence decision making processes concerned with such as commercial investment is required. CSOs and NGOs need to better work together to assist communities with this, and develop a more united front from which to promote pastoral livelihood security.
6. Secure cross-border movement and regional pastoral development should be facilitated that will also contribute to sustaining and enhancing the pastoral production system including marketing/trade and its benefits. Governments, regional and pan-Africa bodies can facilitate this.
7. Communities' indigenous knowledge needs to be understood and built upon within decision making bodies concerned with rangeland use planning and development, together with early warning systems and drought cycle management. Communities require support in strengthening or where necessary establishing collective community institutions, customary or other.
8. Land issues should be incorporated into vulnerability assessments, and drought crisis preparation, management and response processes: mobile pastoralism needs to be the cornerstone of integrated poverty reduction programmes and the building of resilience for pastoralists.
9. A number of research gaps need to be filled including a lack of information on land fragmentation in some geographical areas for example northern Kenya and Uganda (other than Karamoja); the lack of empirical data on the impacts of land use change on pastoral livelihoods and strategies in times of drought

in particular; on processes of sedentarisation under different circumstances and in different contexts; on gender differences and issues; and in clarifying the most appropriate land and resource securing system(s) that can best support pastoral rights and livelihoods.

As this report is being written, pastoralists in northern Kenya and southern Ethiopia are being adversely affected by another drought-induced crisis across their lands. Their situation is made all the worse by land fragmentation, highlighting the need to address rangeland fragmentation as a matter of great urgency.

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GLOSSARY OF TERMS

Adaptation is “the ability to respond and adjust to actual or potential impacts of changing climate conditions in ways that moderate harm or takes advantage of any positive opportunities that climate may afford” (IISD/IUCN/SEI, 2003:5).

‘Climate change’ is taken to mean the term used for changes in climate from global warming which is due specifically to human actions causing excessive emissions of greenhouse gases, notably carbon dioxide from fuel use (Magrath 2008).

Commons are defined as lands, which rural communities possess and use collectively in accordance with community-derived norms. These norms are variously referred to as customary or indigenous tenure regimes. Two distinctions are drawn to help clarify their nature. First, a distinction is drawn between open access **common pool resources** and commons, the former being better defined as unowned and unbounded resources available for public use. In contrast, commons are discrete land areas and over which a known community is locally acknowledged as its owner. Second, a distinction is drawn between **communal lands** and commons. The former refers to whole customary domains and may include both parcels over which individual and family possession is established and collectively owned lands (commons) (Alden Wily 2011).

Common property is characterised by the following elements: overarching ritual and cosmological relations with traditional lands; community ‘rights’ of control over land disposal (sometimes delegated to traditional leaders); kinship or territory-based criteria for land access; community-based restrictions on dealings in land with outsiders; and principles of reversion of unused land to community control (Fitzpatrick 2005: 454).

Community is understood as a human group sharing a territory or domain and involved in different but related aspects of livelihoods— such as managing natural resources, producing knowledge and culture and developing productive technologies and practices. Communities are by no means homogenous, and harbour complex socio-political relations, with diverging and sometimes conflicting views, needs and expectations. Yet, they have major common concerns, which, in healthy situations, lead towards various forms of collaboration and cohesion (Borrini-Feyerbrand et al 2004).

Coping is “the manner in which people act within the limits of existing resources and range of expectations to achieve various ends....Coping can include defence mechanisms, active ways of solving problems and methods for handling stress” (Blaikie *et al.*, 2004:113).

Customary institutions are the structures and ‘rules’ that provide ‘order’ to the lives of rangeland users and are particular to a ‘group’ and its identity. Customary institutions are many and influence if not control what people do, how, when and with whom - from birth, through marriage and family to death (and even afterwards through the memory of and respect for ancestors). Customary institutions govern all aspects of social, cultural, economic and political lives. They are both regulatory systems of formal laws, informal conventions and behavioural norms which may include such as a women’s community support system i.e. they are more than male-dominated village decision-making bodies.

Customary land rights are where current access to land is linked with social norms and networks, and where local powers play an important role in land rights regulation and conflict resolution (Lavigne-Delville 2010).

Drought means the naturally-occurring phenomenon that exists when precipitation has been significantly below normal recorded levels, causing serious hydrological imbalances that

adversely affect land resource production systems (UNCCD Art. I in Ahmed et al 2002).

Formalising rights refers to processes of identifying interests, adjudicating them and registering them. While registration can include titling, an exercise during which rights to clearly defined land units vested in clearly defined individual or group “owners” are documented and stored in public registries as authoritative documents, it need not. And rather it can be the simple writing down on pieces of paper of land transactions in the presence of the recognised local authority or the maintenance of land registers to track tenure changes.

Fragmentation of the rangeland is the breaking up of the total rangeland area into smaller pieces or patches (Reid et al 2004).

Land-grabbing is the usually swift acquisition of land (and property) often by fraud or force.

Land tenure is the relationship, whether legally or customarily defined, among people, as individuals or groups, with respect to land. (For convenience, “land” is used here to include other natural resources such as water and trees.) Land tenure is an institution, i.e., rules invented by societies to regulate behaviour. Rules of tenure define how property rights to land are allocated within societies. They define how access is granted and rights to use, control, and transfer land, as well as associated responsibilities and restraints. In simple terms, land tenure systems determine who can use what resources for how long, and under what conditions (FAO 2002).

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 and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base (Carney 1998).

Pastoralism is a collective livestock-based land use system of which a central feature is the tracking and utilisation of resources temporally and spatially distributed across a rangeland that experiences low and variable rainfall. **Pastoralists**, who increasingly today may be involved in other social, political and economic activities, use this land use system for the securing of their livelihoods. Livestock has both economic and cultural significance for pastoralists.

Rangelands are ecosystems dominated by grasses, grasslike plants, forb, and shrubs. Rangelands result through a complex interplay of biotic and abiotic factors: climate, available nutrients and water, fire, herbivores (livestock or wild ungulates) and anthropogenic/human influences. Rangelands tend to occur in dryland areas with low and highly variable rainfall and often contain a patchwork of resources that include not only grasslands, but also forests, wetlands and mineral sources.

Resilience is the capacity of a system, community or society potentially exposed to hazards to resist, adapt, absorb, utilise or even benefit from change in order to reach and maintain an acceptable level of functioning and structure (UNISDR, 2005; Blaikie and Brookfield 1987).

Sound governance is based on the application of principles, such as legitimacy and voice (through broad participation and consensus-based decisions), transparency and accountability, performance (including responsiveness to stakeholders, effectiveness and efficiency), fairness (equity and the rule of law) and direction (including strategic vision and the capacity to respond to unique historical, cultural and social complexities). (Institute on Governance, 2002)

Vulnerability is defined as “the extent to which a natural or social system is susceptible to sustaining damage from climate change” (IPCC, 1997:1) and “the characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist and recover from the impact of a natural hazard (an extreme natural event or process)” (Blaikie *et al.*, 2004:11). The Report considers vulnerability in the context of exposure to environmental hazards (contingencies, shocks and stresses) and the coping capabilities of people.

ACRONYMS AND ABBREVIATIONS

AFC	Agricultural Finance Corporation
AFD	African Development Bank
ASID	Agricultural Investment Support Directorate
ASAL	Arid and semi-arid land
AU	African Union
CCO	Certificate of community ownership
CHA	Controlled hunting area
CLA	Communal land association
CLC	Customary land certificate
COMESA	Common Market for Eastern and Southern Africa
DAC	Development Assistance Committee
DRR	Disaster risk reduction
ECA	Economic Commission for Africa
EPRDF	Ethiopian People's Republic Democratic Front
FAO	Food and Agriculture Organization
FDI	Foreign direct investment
GDP	Gross domestic product
GIS	Geographical information system
GoK	Government of Kenya
GoU	Government of Uganda
Ha or hct	Hectare
IDP	Internally displaced person
IGAD	Inter-Governmental Authority on Development
ILRI	International Livestock Research Institute
KLDP	Kenya Livestock Development Project
Km	Kilometre
LAPSET	Lamu Port-Southern Sudan-Ethiopia Transport
Masl	Metres above sea level
MOARD	Ministry of Agriculture and Rural Development
MOWE	Ministry of Water and Energy
Mm	Milimetre
NAPA	National Adaptation Programme of Action
NGO	Non-governmental organisation
NP	National Park
NR	Nature Reserve
NRM	National Resistance Movement
ONLF	Ogaden National Liberation Front
OWWCE	Oromiya Water Works Construction Enterprise
PASDEP	Plan for Accelerated Growth and Sustained Development to End Poverty
PEAP	Poverty Eradication Action Plan
PMA	Plan for Modernization of Agriculture
REGLAP	Regional Learning and Advocacy Project

SDPRP	Sustainable Development and Poverty Reduction Program
SNNP	Southern Nations, Nationalities and Peoples
Sq	Square
TARDA	Tana and Athi Rivers Development Authority
TLU	Tropical livestock units
VLUP	Village land use planning
WB	World Bank

AREA CONVERSION

It has not been possible to convert all land measures into one. Therefore please note the following conversions:

- 1 hectare = 2.47 acre
- 1 km sq = 100 hectares
- 1 mile sq = 2.49 km sq

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Fiona Flintan, June 2011

I.0 PASTORALISM, RESILIENCE AND VULNERABILITY

Why do we need pastoralism?

Pastoralism is the most effective production system for many arid and semi-arid areas. It not only feeds the millions who live in these areas (and those that are linked to them) but also makes significant contributions to national, regional and international food security, national and regional economies, biodiversity and the environment (COMESA 2009; SOS Sahel and IIED 2009; Binot et al 2009; Kirbride and Grahn 2008; Nori 2007; Rass 2006; Niamir-Fuller 2005; UN-OCHA-PCI 2007).

Pastoralism has unique adaptive characteristics. In an enabling environment this means that pastoralists can build resilience, reduce vulnerability to drought and adapt to predicted climate change (see Box 1.1) (Nassef et al 2009; Pavanello 2009; Kirbride and Grahn 2008; Oba 2009). Pastoralists know that drought will come and it can be overcome (UN-OCHA-PCI 2005). Pastoralists actively thrive on and exploit variability and do not just minimise its associated risks (Nassef et al 2009; Krätli 2008).

Box 1.1 Climate change in Ethiopia, Kenya and Uganda

The climate of the Horn and East Africa is becoming more variable and less predictable, and trends towards future changes are emerging. In Ethiopia, Kenya and Uganda overall temperatures have increased by between 1-1.3°C between 1960-2008. Though there has been little change in overall rainfall amount, patterns have changed and variability has increased (Magrath 2009; McSweeney et al 2008a; b; c). Global climate models predict further changes – increased temperature, shifts in rainy seasons, shorter and more intense – which will result in a mosaic of changing climate conditions with serious implications for land use and production systems (Nassef et al 2009).

Though there is likely to be more rain, there can also be more drought influenced by changes in the La Niña effect of the El Niño and Southern Oscillation (ENSO) phenomenon (Adger et al 2003). What matters, and in particular for farmers, is the effectiveness, timing and distribution of rain throughout the crucial growing seasons. It is likely that rain will come in heavier bursts. This type of rain may not only be less useful, it can also be positively damaging, smashing crops and washing away topsoil. In Uganda for example, if the predicted two degree rise in temperatures happens within the next ten years, it is likely that most of Uganda's coffee production (upon which some five million people rely) will be wiped out (Magrath 2008). Of all the natural resource-based land uses in the drylands, pastoralism functions better within the context of wide rainfall variability and unpredictability. It therefore presents a logical adaptation route for climate change and more so than livelihood activities and land uses which do not have the advantage of mobility (Nori and Davies, 2006).

What does pastoralism need?

Mobility and access to 'key-sites'

To enable pastoralism to effectively utilise drylands, pastoralists with their livestock² need to be able to move across the rangeland of patchily distributed resources, highly influenced by the low, variable and comparatively unpredictable rainfall³ (Butt, 2010b; PFE et al 2011; Nori 2007; Piers Simpkin 2005; Rugadya 2006; Pavanello 2009; Nassef et al 2009; Rass 2006; Oba 2009; SALDO 2009). This includes being able to access the best grazing⁴ available at different times of the year including dry season grazing areas found along rivers or where there is a permanent water source. These 'key-sites'⁵ not only provide critical grazing when grass/browse elsewhere has been depleted, but also are part of strategies to allow the resting of wet season grazing areas and to kill-off livestock-parasite populations (Butt 2010b). It is also important for animal husbandry: camels for example cannot stay more than seven days in the same place due to disease problems (PFE et al 2011). Figure 1.1 provides examples of dry season migration routes and kraal (temporary enclosure) locations in Uganda.

Movement may also be made across altitudinal zones in response to changes in climate and vegetation growth (Flintan et al 2008; Oba 2009; Roba and Witsenburg 2004). Movement is required for accessing such as minerals and medicinal herbs for livestock, house-building materials, supplementary or 'famine' foods, and other rangeland products used by the household. It may also be required to avoid conflict and/or to defend one's lands, resources and community.

Additionally, movement is vital for trade and accessing markets. Migration routes may extend across countries and even across national borders⁶. For example the marketing

² Indigenous livestock have a sophisticated digestive capacity to process fibrous vegetation, and are ideally suited to a diverse landscape where production varies over time and from place to place and where grasses and shrubs are the forage supply (Rugadya 2006).

³ Pastoralists in East and Horn of Africa are mainly found in the semi-arid rangelands that tend to receive less than 1000mm of rainfall per year over less than six months, with the remaining months being relatively or absolutely dry (Mortimore 1998). As a result arid and semi-arid rangelands produce forage that can be highly variable in time and space. Not all areas are limited by water and there are pockets of wetlands, river flood plains or margins of lakes. These offer valuable dry season grazing, and opportunities for flood recession or irrigated farming.

⁴ It is commonly believed that pastoralists move in response to pasture shortage. While this may be true at times, it is not the main reason why they move. As a general rule pastoralists are much more concerned with the quality of the diet, as measured by animals' health and productivity. They usually move towards higher quality rather than away from low quantity. Selective breeding and selective eating are encouraged to optimise productivity (IIED and SOS Sahel 2010).

⁵ Called 'key-sites' by (Niamir-Fuller 1993 in Rass 2006) or 'rangeland productivity hotspots' (Flintan and Cullis 2010).

⁶ In just five border areas including eastern Ethiopia/Somaliland, southern Somalia/northeastern Kenya, western Ethiopia/eastern Sudan, southern Ethiopia/northern Kenya, northern Kenya/southern Kenya, the cross-border livestock trade is estimated to be worth US\$61 million per annum with about 90% occurring through unofficial channels (COMESA 2009). Cattle trekked for over 450 kms from southern Somalia

routes used by pastoralists from northern Kenya extend across the country to Nairobi and Mombasa and have proved highly resilient despite a host of political and other challenges. The use of these routes have also been important for building closer economic ties in the region and have social and political benefits too, adapting to new economic and social challenges and opportunities. The cross-border clan relationships that have underpinned the trade in the past are increasingly giving way to multiple clan business enterprises based on complex market arrangements and channels. These involve extensive networks of people and help to build trust and integration among them (Mahmoud 2010: 1) (see Figure 1.2).

Figure 1.1 Dry season migration routes and kraal locations in Karamoja, Uganda

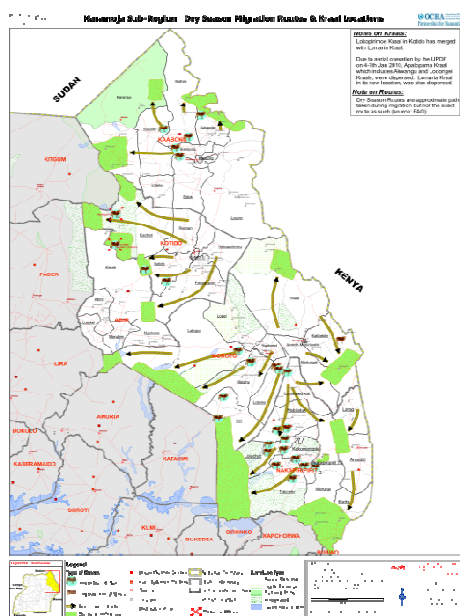


Figure 1.2 Livestock marketing routes across Ethiopia, Kenya, Somalia and Djibouti (Source Mahmoud 2010)

account for 26% of the beef consumed in Kenya and 16% of that consumed in Nairobi (Little and Mahmoud 2005).

Strong social networks and support systems

Of equal importance are the social networks and reciprocal arrangements that are developed by pastoralists as part of the pastoral system. These include those developed through the clan system, through kinship and those established with different land users including agriculturalists and through related marketing chains (see for example Ahmed et al 2002; Nassef et al 2009; Rass 2006; Oba 2009; PFE et al 2011). These networks and arrangements manage and provide access to resources including grazing and water⁷, are often mutually reinforcing, and often prove critical for the lives of both humans and livestock in times of stress such as drought. The alliances that result may cover entire regions: the Boran-Digodia alliance for example bound together half a million people across the Kenya, Somalia and Ethiopia border until it broke down in 1997 (Umar 2007). Others may occur across communities where animals are dispersed in herds of allied households, as separated herds are likely to be affected differently by disease and drought (Rass 2006).

Working and managing the environment and the pastoral system collectively spreads risk between the members of the group. Pastoralists tend to respond to drought or other crises in steps: risk minimisation, risk absorption, and risk-taking to survive with different strategies for each (PFE et al 2011). The clan protects livestock wealth, and redistributive mechanisms provide some insurance against loss (Umar 2007; PFE et al 2011). In particular the poorest members of pastoralist societies benefit, sharing customary ownership of the rangelands (and its resources) with richer members, and these may be their only real 'property' (Alden Wily 2005a).

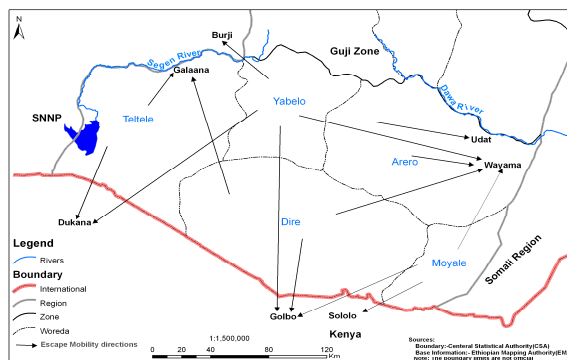
Though there will be common practices and norms in both the routes taken by humans and livestock, and the social networks and relations that support them, these will change and adapt over time and in response to events such as drought and in times of drought recovery (e.g. Kenya – Butt 2010a/b; Oba 2009 or Ethiopia – see Figure 1.3 which shows the 'escape routes' out of Borana in times of severe crisis).

Droughts and their severity are hard to predict and drought-cycle management always has an element of speculation, as nobody knows in advance when the rains will recommence. Movement away from the homestead tends to increase during times of drought (Somali region, Ethiopia – Coulter et al 2010; Afar and Gambella, Ethiopia – Piers Simpkin 2005; Garissa, Kenya – Mahmoud 2010). This is likely to include a movement cross-border. For example in 2009 more than 3,000 Kenyan Maasai moved

⁷ The majority of rangelands are held as commons under customary tenure regimes. The sound management of rangelands is promoted through norms of inclusion (and to a lesser extent exclusion) designed for pastoral activity. In Borana, Ethiopia for example these are called *seera marraa bisanii* – 'the law of grass and water'. Resources are managed as common property with access derived in the first instance as a member 'of the group' (Cousins 2007). Indigenous knowledge about the land, resources and their dynamics are key to successful decision-making about such as movements (Rugadya 2006). Regulating laws and institutions tend to work first and foremost on the basis of 'territory' or 'domain' under which a hierarchy of 'nested' overlapping 'bundles' of rights for different sets of users exist, and often for the same resource (Flintan 2011; Ethiopia – Boku Tache and Irwin 2003; Nori 2008; Kenya – Niamir-Fuller 2005; Oba 2009; Uganda – Rugadya et al 2010).

into Tanzania as well as coastal regions and north-west Kenya – places they had never been to before (UN OCHA 2010). Often more localised movement will be made over a greater area and for example, up to highland areas (Afar – Piers Simpkin 2005) or to state farms (Gambella – Piers Simpkin 2005) or National Parks (Garissa – Mahmoud 2010). This will often put the pastoralists into direct conflict with non-pastoral land users unless prior agreements are in place (UN-OCHA/IOM/ISS/UNEP 2010).

Figure 1.3 Map of ‘escape routes’ from Borana in times of drought (Source: Eyasu Elias 2009).



As such flexibility is required both in terms of physical space and in terms of social relations. Indeed, not only do households constantly redistribute themselves over the terrain in response to climatic fluctuations and the needs of herd management, but also membership of pastoral households is continually changing as labour is allocated and reallocated between management units. Compositions of households and herding camps in Uganda for example change seasonally and annually, depending on economic conditions and social demands. This flexibility in social organisation is essential to household survival (Rugadya 2006). Households often split herds (of mixed, selected livestock types and age) with some migrating to far off pastures and others (including young and/or the old and sick) being kept near the household (SOS Sahel and IIED 2009; Turkana – Akabwai, undated; Somali region, Ethiopia – Coulter et al 2010; PFE et al 2011; Uganda – UN-OCHA 2010).

Assets

Pastoralists also need assets that provide them with the strong foundation from which to manage change and on which to build their livelihoods. Collective ownership ensures that all members of a group have access to assets (including material assets i.e. livestock, and social assets including people). Herd accumulation is a way of buffering pastoralists against drought – larger herds facilitated by mobility are a key factor in pastoralists' ability to overcome drought. When collective systems break down the poor are left more vulnerable than the better off, and more likely to be asset-less (Little et al 2008).

Assets such as financial capital, labour and knowledge provide a good base and investment for income diversification, which can strengthen pastoral livelihoods. However without these assets livelihood diversification becomes more of a desperate scramble for survival and forces the poor to scatter their efforts in low-skilled, low-income, broad-spectrum casual employment (Nassef et al 2009).

In addition as households find the number of livestock in their herd driven below a critical threshold, it becomes impossible to rebuild the herd even in relatively good periods, and in particular where social support systems have broken down. Today, even where social support systems are still functioning the wealthy may not have enough livestock for building their own herds let alone to redistribute to the poor in an attempt to build theirs.

Increasing vulnerability of pastoralism?

Maintaining access to rangeland resources and collective social relations, and building pastoral assets, are vital for sustaining the productiveness, effectiveness and development of pastoralism, and enabling pastoralists' resilience to drought and adaptation to climate change. In the last few years however, it has become increasingly clear that pastoralists' are finding it progressively difficult to overcome drought, which appears to have increased in intensity and length, and be happening on a more regular basis (Nassef et al 2009; Kirbride and Grahn 2008)

Pastoralists in Ethiopia, Kenya and Uganda argue that this is not because droughts have increased, but because their ability to overcome them has been reduced. As this report shows, a key reason for this is the steady fragmentation of the rangeland and restricted access to key resources in particular dry season grazing areas. If fragmentation continues the whole pastoral system could collapse because without access to these key areas, pastoralists are unable to sustain production on the rest of the rangeland.

This report

This report is written in a time of increasing awareness that land fragmentation is occurring in the rangelands, but without a clear understanding of its causes, processes⁸ and impacts. This report aims to improve this understanding and in particular the impacts of land fragmentation on the resiliences and vulnerabilities of pastoralism and pastoralists to drought and climate change.

The issues have been explored through in-depth literature reviews in the countries of Ethiopia, Kenya and Uganda plus selected interviews with people working on the subject. The report summarises the policy and development context of these countries and the place of pastoralism within them. It identifies key processes and trends of land fragmentation and the impacts that these are having on pastoral livelihoods and social

⁸ Some causes are also processes. For example change of land use to agriculture is both a cause of land fragmentation and a process of land fragmentation (for a detailed discussion on land fragmentation, causes and processes see Reid et al 2004).

systems, and thus pastoral resilience and vulnerability. Conclusions and recommendations are made for each country case study, and overall conclusions and recommendations that cut across the countries are made in Section 5.0.