

PASTORALISM AS A CONSERVATION STRATEGY

UGANDA COUNTY PAPER

Prepared for IUCN Study

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EXECUTIVE SUMMARY

Pastoralism is the finely honed symbiotic relationship between local ecology, domesticated livestock, and people in resource-scarce and highly variable regions, often at the threshold of human survival. It represents a complex form of natural resource management, involving the direct interaction between three systems in which pastoral people operate, i.e. the natural resource system, the resource users system and the larger geo-political system. It is most often an adaptation to semi-arid climatic conditions in which farming cannot be easily sustained, making the best use of biodiversity in harsh conditions through exploiting different ecological and landscape niches in different seasons with different species of livestock. In Uganda, pastoralists range from agro-pastoralists, who are largely sedentary, combining livestock and crop production to transhumants who maintain a home base and a satellite herd in search for water and pasture depending on the harshness of the environment and as need arises.

Recent work in the “new” rangeland ecology suggests that the remarkable long-term success of pastoral systems is predicated less on the establishment of an equilibrium with nature through the imposition of systemic behavioural and cultural constraints that the conservationist model seems to imply than on the interaction of a highly dynamic process of animal production and husbandry with a highly resilient dry land ecosystem that is capable of absorbing periodic, short-term grazing pressure when rainfall is low because of its remarkable powers of recuperation when rains return. This has discerned theories such as the “Cattle Complex” by Hertovitz’s and “Tragedy of the Commons” by Garret Hardin, the former perceived pastoralism to be a social problem, whereas the latter considered it to be an ecological problem, raising the inevitable question as to whether the concept of the pastoralist being conservationists is a myth or reality.

It is often argued that indigenous peoples live in balance with their environment and, more generally, in harmony with nature. Considerable ecological knowledge and wisdom is held by pastoralists emphasizing food self-sufficiency and local resource conservation. Lacking the myth of superabundance, these communities traditionally see themselves as part of the community of nature, realizing that persistent violation of its ecological roles will inevitably reverberate and destroy their own culture. Yet, in recent decades, attempts at promoting economic production have tended to follow the patterns divorced from indigenous knowledge and practices. What is clear is that there is a strong nexus between environmental care and maintenance of indigenous people’s culture. The crucial elements of how pastoralists do actually conserve the resources on which they depend, subsists on the conception that they live in “harmony with nature” without driving the exploited natural resources into extinction. When indigenous people do not wipe out the resources they exploit they are believed to be living in harmony with nature and practicing conservation.

The question of whether a group of people is “truly conservationist” requires attention to a complex of historical and cultural factors—the broader question of the relation of ideology to adaptations. Conservation outcomes observed among pastoralists are largely the epiphenomenal consequence of high mobility, low population, dispersed water sources, disease avoidance, and security issues. Pastoralists here are unlikely to favour exclusive rights; for them territorial boundaries should remain fuzzy and negotiation over access should remain a permanent process in which individuals or user groups re-evaluate their share of pastoral resources and their particular level of control over strategic resources.

1 BACKGROUND

1.1 Introduction

Pastoralism is a natural resource based subsistence pattern in which people make their living by tending or grazing herds of animals in a communal or free range system on natural pastures, involving mobility to track seasonally available resources. Pastoralism is most often an adaptation to semi-arid climatic conditions in which farming cannot be easily sustained this means that pastoralism is the most efficient way of using resources in dry land and marginal areas. Consequently, pastoralism is usually the optimal subsistence pattern in arid and semi-arid areas.¹

Pastoralists, in essence, make the best use of biodiversity (grasses, herbs, trees and shrubs) in harsh conditions through exploiting different ecological and landscape niches (plains, hills, riverine areas, woodlands) in different seasons (wet and dry) with different species of livestock (cattle, camels, goats, sheep and donkeys). Because of variable and often harsh conditions, mobility is critical to enhancing ecosystems resilience, for managing risk and being able to manage their critical safety net areas of dry season rich patch vegetation— many of which have been lost of agriculture (irrigated and rain fed) or have been reserved (as forest reserves, hunting areas or national parks).

There are essentially two forms of pastoralism namely: nomadism and transhumance². Pastoral nomads follow a seasonal migratory pattern that can vary from year to year. The timing and destinations of migrations are determined primarily by the needs of the herd animals for water and fodder. Pastoralist nomads are usually self-sufficient in terms of food and most other necessities. On the other, transhumance pastoralists follow a cyclical pattern of migrations that usually takes them to cool highland valleys in the hot season and warmer lowland valleys in the cold season. Transhumance pastoralists usually depend somewhat less on their animals for food than do nomadic ones. They often do small-scale vegetable farming at their encampments. They also are more likely to trade their animals in town markets for grain and other things that they do not produce themselves³.

In Uganda, pastoralists range from agro-pastoralists, who are largely sedentary, combining livestock and crop production to transhumants who maintain a home base and a satellite herd in search for water and pasture depending on the harshness of the environment and as need arises⁴. Agro-pastoralists may be described as settled pastoralists who cultivate sufficient areas to feed their families from their own crop production. Both pastoral and agro-pastoral systems exist in the dry lands, often engaging similar opportunistic strategies to address similar constraints imposed by the risky environments that they share. While livestock is the valued property, their herds are on average smaller than other pastoral systems, possibly because they no longer solely rely on livestock and depend on a finite grazing area around their village which can be reached within a day.

1.1.1 *Indigenous versus Modern*

The ability of pastoral populations to manage their own resources is viewed with skepticism, this skepticism results from the view that pastoral production is the cause of

¹ Daniel Rotich Kandagor, 2005

² Ben Knighton, 2005

³ Daniel Rotich Kandagor, 2005

⁴ Frank E. Muhereza and Sarah A. Ossiya, 2003

degradation and desertification, due to the inherent incentive problems of common property production and the cultural values of pastoralists⁵. Since the 1970s, Uganda government's view of pastoralism is influenced by Hertovitz's "Cattle Complex"⁶ and Garret Hardin's "Tragedy of the Commons"⁷ theories, the former perceived pastoralism to be a social problem, whereas the latter considered it to be an ecological problem. These theories enhanced the view that pastoralism is archaic, unproductive and environmentally damaging relic of the past, which needs to be brought into line with "progressive" and "modern" development concepts such as land titling, privatization of the commons, sedentarisation, and provision of permanent water.

In the 1990s, a paradigm shift took place (not in the country context of Uganda, rather worldwide) with respect to herbivore-vegetation dynamics in (semi-) arid systems. Previously, it was argued that rangeland systems behave as equilibrium systems primarily influenced by biotic factors, with grazing being the main driver of vegetation change. Consequently, degradation (the loss of productive land) was attributed to excessive stocking rates⁸. A relatively low fixed stocking rate was recommended as the appropriate management strategy in order to avoid overuse of the vegetation. In contrast to this, new rangeland science argues that (semi-) arid systems, characterized by highly unpredictable and variable rainfall, behave as non-equilibrium systems, that means, abiotic factors such as prior rainfall are considered the main drivers of the system dynamics, and biotic factors such as grazing to be only of marginal influence. It is argued that fixed stocking rates are unsuitable in a variable environment and instead "opportunistic strategies" are favored⁹.

The non-equilibrium concept has been vividly discussed by ecologists especially its tenet that herbivores have minimal impact on vegetation or production. Analyzing successful range management systems in semi-arid ecosystems, for instance, pastoral nomads have developed sophisticated strategies adapted to the temporal and spatial heterogeneity of fodder production. However, the value of analyzing this indigenous knowledge with respect to range management has not filtered into policy. Since the future of large tracts of land depends, on drastic changes in traditional attitudes towards land use, and range management among relatively unsophisticated and uneducated indigenous peoples, that make use of this fragile ecology for production and livelihood, it becomes important to understand the experience and knowledge of pastoralists in their ecosystem, within policy debates.

The emerging "new ecology" questions concepts such as carrying capacity and stocking rate in predicting ecosystem productivity and dynamics at the scale necessary for local-level management¹⁰. Carrying capacity estimates are normally based on assumptions about the impact of livestock on plants and plant succession. Despite much more careful

⁵ Guyo O. Haro, Godana J. Doyo and John G. McPeak, 2003

⁶ The cattle complex refers to a complex of cultural characteristics that evolved from cattle rearing-where cattle are kept in large numbers for social status rather than economic or production considerations- but was interpreted as psychological complex labeling African cattle rearing as non-economic, counter productive and even un-ethical production

⁷ This uses the example of rangelands to argue that when many people have access rights to the same resource, there is a potential for each individual to overuse and under invest in the resource. Hardin proposed that land degradation was occurring due to overstocking of livestock arising from a traditional system in which land was owned communally, leading to a lack of incentives to manage it properly; "tragedy of the commons" is more intellectual concept than universal experience.

⁸ Just as Hardin argues in the "Tragedy of the Commons"

⁹ Birgit Muller, 2005

¹⁰ Maryam Niamer-Fuller, 1998

scientific analyses of soils, rainfall, forage, and output, eminent experts were still disagreeing 'by factors of four or five over the "correct" stocking rate of a given range. It has been asserted that in the arid context, it is precisely the two factors of space and time, rather than number of animals that determine sustainable carrying capacity and these have been used efficiently by traditional pastoral managers in the rangelands, the best consensus of ecologists is that there is much to be said for a traditional tracking strategy, from which the pastoralists have never even tried to depart¹¹. Since the amount of precise information on stock carrying capacities is usually insufficient for practical purposes, recent research, as distinct from policy, has concluded that carrying capacity is an unsound concept of questionable validity¹².

Considerable ecological knowledge and wisdom is held by pastoralists emphasizing food self-sufficiency and local resource conservation. Lacking the myth of superabundance, these communities traditionally see themselves as part of the community of nature, realizing that persistent violation of its ecological roles will inevitably reverberate and destroy their own culture. Yet, in recent decades, attempts at promoting economic production have tended to follow the patterns divorced from indigenous knowledge and practices. What is clear is that there is a strong nexus between environmental care and maintenance of indigenous people's culture, though much discussion of this "nexus" tends to be rather generalized and rhetorical.

Indigenous communities have often been portrayed as ideal conservationists, possessing a spiritual world-view in which humankind and nature are regarded as indivisible. Accordingly, it is reasoned, "commercial consumption, exploitation of natural resources, and notions of enrichment are not part of indigenous cultures"¹³. Recent work in the "new" rangeland ecology suggests that the remarkable long-term success of pastoral systems is predicated less on the establishment of an equilibrium with nature through the imposition of systemic behavioral and cultural constraints that the conservationist model seems to imply than on the interaction of a highly dynamic process of animal production and husbandry with a highly resilient dry land ecosystem that is capable of absorbing periodic, short-term grazing pressure when rainfall is low because of its remarkable powers of recuperation when rains return¹⁴.

1.1.2 The Review

In this review, there is a broader understanding and acceptance of the rationale behind pastoralism, as an appropriate and potentially sustainable form of land use in harsh and arid climates, based on the need to evaluate the inherent belief that pastoralists have displayed ability and capacity to "live in harmony with the environment"¹⁵, thus practice inherent conservationism. Controversy exists as to whether the concept of the pastoralist being conservationists is a myth. Central to this controversy is the problem of how to identify conservationist behavior and the issue of whether sound management of common property is likely to evolve. While social scientists have documented instances of restraint in the use of resources, those who adopt an evolutionary perspective are challenged to identify the selective mechanisms whereby such altruistic conservation acts might be maintained in a population¹⁶.

¹¹ Ben Knighton, 2005

¹² Ben Knighton, 2005

¹³ Benjamin J. Richardson, 2005

¹⁴ Lore M Rutten and Monique Borgerhoff Mulder, 1999

¹⁵ Lore M Rutten and Monique Borgerhoff Mulder, 1999

¹⁶ Benjamin J. Richardson, 2005

It is often argued that indigenous peoples live in balance with their environment and, more generally, in harmony with nature. The base of this view is the observation that small populations with limited technology subsist on plant and animal species without driving these resources to extinction and without causing long-term degradation of the environment, hence putative harmonious relationship. The common thread in all these relations is that indigenous populations' exhibit enormous environmental knowledge that in itself guarantees these societies not to deplete their resources over the long term, such knowledge is of potentially immense value for resource managers, and hence indigenous people possess an intrinsic conservation ethic¹⁷.

In order to disentangle these arguments, it becomes important to understand the concept of Conservation. Conservation is defined¹⁸ in two ways; first, it commonly refers to the maintenance of genetic, species, and ecosystem diversity in the natural abundance in which they occur. Actions intended to and do in fact prevent or at least mitigate resource depletion, species extinction, or habitat degradation. These acts are costly and entail the sacrifice of immediate rewards in return for delayed ones. Four principal conditions confirm the existence and practice of conservation in this category, these include:

- (a) First, there must be mechanisms whereby outsiders can be excluded from resources.
- (b) Second, there must be within group mechanisms to enforce restraint and penalize cheaters.
- (c) Third, there must be mechanisms whereby resources can be inherited by offspring, such that long-term benefits can accrue to conservers.
- (d) Fourth, there must be no alternative forms of investment yielding higher rates of return than the conserved resource

Secondly, conservation is also defined as actions that “are intended to and do in fact prevent or at least mitigate resource depletion, species extinction, or habitat degradation”. This definition highlights five criteria:

- (a) The act must be costly, at least in the short run;
- (b) The act must be the true cause of the conservation outcome. In other words, the behavior must well be designed for the task of conservation, it must be abundantly clear that resource protection is not the result of some other factor, such as low population density or high mobility. Such incidental outcomes are called “epiphenomenal conservation”.
- (c) The act must have the demonstrable effect of conserving the resource. Often an act is claimed to have a conservation effect without conclusive evidence of that effect over time.
- (d) There must be some mechanism whereby the act is maintained in the population—most plausibly the operation of natural selection on genetic or cultural traits. Thus, the act must be immune to invasion by other (non-conservationist) variants.
- (e) The act must be intended to ensure conservation.

In all this the role of intent in defining or identifying conservation is important, although “intentionality is too narrow a requirement, hence the need to expand it to ‘intention or design,’ where by ‘design’ refers to a non-intentional process such as “natural selection”, where such a definition requires that true conservation not only reduce or prevent resource depletion but be *designed* to do so by the operation of some mechanism.

¹⁷ Lore M Rutten and Monique Borgerhoff Mulder, 1999

¹⁸ Lore M Rutten and Monique Borgerhoff Mulder, 1999

Pastoralists have to play a larger role in the design of conservation strategies than natural selection or accidental events¹⁹. The crucial elements of how pastoralists do actually conserve the resources on which they depend, subsists on the conception that they live in “harmony with nature” without driving the exploited natural resources into extinction. When indigenous people do not wipe out the resources they exploit they are believed to be living in harmony with nature and practicing conservation. Conservation for the sake of preserving biodiversity seems to be unknown among pastoralists²⁰.

1.2 Country Context: Uganda

Uganda is a land locked country situated in East Africa bordered by Sudan to the North, Zaire to the West, Rwanda, and Tanzania to the South, and Kenya to the East. Its total area is 241,039 sq km, of which 197,097 sq km. is land while water and swamps cover the rest, which is approximately 43,942, sq km. It lies between latitudes 42⁰ north and 1.5⁰ south and longitudes 28⁰ and 35⁰ east. Although 42% of the country’s total land area is suitable for agricultural use, only 21% is currently under cultivation and this is mostly in the southern regions. A large part of the country, particularly in the North and Northeast is, not suitable for agriculture due to poor rainfall and the prevalence of tsetse fly²¹, in this area livestock rearing is an important activity.

Uganda’s population is approximately 24.4 million (projected to 28 million by 2006), growing at the rate 3.3% per annum²². This population growth rate is the third highest in the World after Niger and Yemen²³. In terms of structure, Uganda’s population portrays a “young population” with 56% of the population below 18 years. The sex ratio is 95 males to 100 females, about 88% of the population live in the rural areas and are largely dependent on agriculture, 22% of all household are livestock keeper (of these 66% are found in the cattle corridor)²⁴. Only 12% of the population lives in urban centres. This population structure is bound to exert on the provision of social infrastructure and concomitant services, it has serious consequences such as intensifying pressures on the economy and natural environment for provision of basic requirements (e.g. shelter, food, energy, and social services). This is further complicated by the impact of the HIV/AIDS pandemic.

The country occupies a plateau averaging 915 meters in the north and rising to 1,340 near Kampala. Uganda’s highest point is the Margherita Peak of Mount Stanley, at 5,109 m (16,762 ft) above sea level, found in the western rift in the Rwenzori ranges, which lies along the southwestern border near the Equator. In addition to lakes, which cover approximately one fifth of its territory, the country also has a complex system of rivers many of which are to be found in the south of the country and which drain into Lake Victoria. Uganda has favorable but varied climatic conditions; greater part of the country receives an average of 1000 to 1500 mm rainfall per annum, though the highland areas and some islands in Lake Victoria receive well above 2000mm. The mean annual rainfall distribution in Uganda ranges from as low as less than 500mm in some places to as high as 3500mm. Temperatures vary from place to place and range from as low as 0°C or less on the highest Mountains, to as high as 39° C in the north (Gulu, Kitgum, the western Rift valley, and some parts of Karamoja)²⁵.

¹⁹ Little Peter, 1999 commenting on the article Are East Africa Pastoralists Conservationists by Rutten and Mulder

²⁰ Lore M Rutten and Monique Borgerhoff Mulder, 1999

²¹ Recently considered to be eradicated, as of 2006

²² Uganda Bureau of Statistics, 2002

²³ World Population Report 2005

²⁴ Main Report of the Population Census of 2001 and in Muhereza Frank on Pastoralism in Uganda

²⁵ [http:// www.encyclopedia.com](http://www.encyclopedia.com)

Uganda's economy has been very dynamic since independence but is still largely dependent on the agricultural sector (food and cash crops, forestry, livestock and fisheries). Agriculture contributes more than 50 % of the country's GDP and employs more than 71% of the total population engaged in subsistence agricultural production directly or indirectly. Livestock constitutes a crucial part of Uganda's food production, accounting for roughly one third of the total value of agricultural output. It contributes about 8% of the country's GDP, 90% of which is produced by small herders, with only 10% deriving from commercial ranches²⁶. This production level makes Uganda almost self-sufficient in meat, a position similar to that of the food crop sub-sector. Pastoralists in the rangelands support about 90% of the national cattle population, mainly kept by pastoral and agro-pastoral communities. About 85% of the total marketed milk and beef in the country is produced from indigenous cattle, which thrive on natural rangeland pasture²⁷.

1.2.1 Pastoral Lands and Zones

Rangelands are traditionally and principally cattle grazing areas, where the inhabitants practice pastoralism with varying intensity depending on the culture under communal land tenure. The communities have preferential grazing rights over specific areas where animals were always on the move in search of pasture and water. Uganda's rangelands²⁸ occupy what is commonly referred to as the "cattle corridor", an unbroken stretch of land area from the north east in Kotido, Moroto, Nakapiripirt and Katakwi covering parts of Apac, Lira, Sorti and Pallisa district, to the north central part in Luweero, Nakasongola and Mubende to Masaka, and the southern Ankole districts of Mbarara, and Ntungamo. It supports about 90% of the national cattle population, mainly kept by pastoral and agro-pastoral communities. Uganda's rangelands cover an estimated area of 84,000 sq. km, or 43% of the country's total land area, and contain a population of 6.6 millions²⁹.

The land tenure of most of the rangelands is communal, with grazing mainly on natural pasture. However, major socioeconomic changes are occurring in the drylands and these have affected this ecosystem. As population increases more land is being cultivated, such that even the marginal areas which are traditionally grazing lands are being colonized, this makes them the second most fragile ecosystem after the highlands in Uganda with low and unreliable (erratic) rainfall and varied sparse vegetation (dry grass savannah to dry thickets and or shrubs). These areas can also be described as areas of great difficulty in view of frequent scarcity of water resources, which often prompts migration to other areas for survival³⁰. The cattle corridor has diverse but ethnically related people, the main cattle keepers are the *Bahima* in Mbarara and Ntungamo districts, the *Basongora* near Rwenzori Mountain in Kasese and Bundibugyo districts, and the *Karamojong* in Moroto, Kaabong, Nakapiripirt and Kotido districts. Other cattle keepers in the area include the Itesot of Soroti, Pallisa and Katakwi districts, the *Baruli* of Nakasongola and Luweero districts, and mixed ethnic backgrounds mainly *Banyarwanda* in Mubende, Masaka, Kiboga and Masindi districts. They have similar political economies, though the *Itesots* and the *Baruli* practice sedentary cattle keeping, and the *Basongora* and *Karamojong* practice transhumance³¹. In Karamoja and most parts of the cattle corridor, the zebu type of

²⁶ Frank E. Muhereza and Sarah A. Ossiya, 2003

²⁷ Margaret Rugadya, 2004

²⁸ referred to as drylands used in a broad sense to cover natural grassland, bush land, and woodland

²⁹ W. Kisamba-Mugerwa, 2001

³⁰ Bob Nakileza and Edward N. B. Nsubuga (Editors), 1999

³¹ W. Kisamba-Mugerwa, 1992

Zone A: Central Corridor

The central cattle corridor is a semi arid livestock belt which stretches from the borders of Rwanda and Tanzania in the south, northwards through parts of Mbarara, Rakai, Masaka, Mpigi, Mubende, Kiboga, Luweero and Nakasongola districts in central Uganda. The topography of the zone consists of gently to very gently rolling hills and plains, at an altitude of mostly 1,000 - 1,400m. However, the hilltops may rise to 1,300 - 1,700m. The East Ankole - West Masaka and Mubende sub-zone receives mainly convectional rainfall varying from 750-1000 mm. This area is drier in June and July probably due to the effect of the dry South East trade winds blowing over Lake Victoria.

The vegetation mostly consists of short savannah grasslands of *cymbopogon*, *themeda*, *chloris*, *loudetia*, *hyparrhenia* and sometimes *echinocloa* and *terminalia* grasses. The common shrubs and thickets found in associations include combretum and acacia and sometimes thorn scrubs. The central dry zone is covered by soils of fair productivity that are ferrallitic in nature. They are mostly loams, sandy - loams and clay - loams. Sometimes there are also humic loams from phyllites and red gravelly soils. The pastoral people in this belt depend on both crops and livestock and mixed farming hence are agro-pastoralists. The grazing population per hectares per household ranges from 3.8 to 13.7, it is the largest or the main pastoral area.

Zone B: The North - East Zone

The northeast cattle zone stretches through the districts of Katakwi, Moroto Nakapiripirit, Kotido, and parts of Kitgum district. In December to February, the North Eastern monsoon contributes to the dry conditions. The northeast sub-zone (Karamoja) is drier and has the lowest total rainfall (650-1000mm per annum) and longest dry season with pronounced drought in November to March. Rainfall occurs in April-August with peaks in May to July and minimum in June. Some orographic rainfall is received on the eastern slopes of the hills and mountains. There is some crop cultivation especially in the wetter areas in the valleys and mountain slopes

The topography consists of a low plateau and rolling plains, and broadly rolling to flat plains at an altitude of 1000 - 1440 m. Occasional outcrops of hills, and volcanic outcrops in Bokora (Moroto district) interrupt the plains. The vegetation consists mainly of grass savannah made up of *hyparrhenia*, *combretum*, *Brachiaria*, acacia trees and thickets. Karamoja also has steppes and savannah woodlands and bush lands. The soils are of sands, loamy sands of low water holding capacity in Katakwi, and black clays in Moroto. In addition, there are also ferrallitic soils. In Karamoja, people depend extensively on cattle keeping, the main activity is agro-pastoralism, which is practiced by the Dodoth, Jie, Bokora, Matheniko, and Pian. The area is also home to abundant wildlife as well, and large areas of land gazetted for wildlife conservation as Game Reserves, Forest Reserves, and a National Game Park.

Zone C: Rwenzori-Kazinga Zone

This is the smallest of all the semi-arid zones it is located in western Uganda in the Rwenzori-Kazinga area. It covers part of Kasese and Bundibugyo districts. The topography is of mountain slopes of the Rwenzori at an altitude of 1,000 - 1,800 m. At lesser altitudes of 1,200 - 1,500 m, the topography is made up of steep, stony hills. These drop to flat plains at an altitude of 900-1,200 meters.

The vegetation consists of dry acacia, *cymbopogon*, *themedra* savannah, and moist *combretum* savannah with forest savannah forms on lower ground, and *themedra heteropogon* grass savannah and high altitude moorland and heath. High altitude forests dominate the mountain slopes, while elephant grass is dominant on the flats and papyrus swamps in the valleys. The soils are clay-loams and sandy-clay-loams of low to high productivity though they have been little used for crop farming. In some areas they are gravelly or stony and are mostly of low erosion hazard. The *Basongora* pastoralists and the Bakonzo cultivators occupy this tension and have constant tensions over land use.

Zone D: Albert -River Nile Belt

The Albert-Nile Belt is a narrow stretch in the rift valley on the shores of Lake Albert northwards through Hoima, Masindi, Nebbi, Moyo, and Adjumani districts towards the Uganda - Sudan border. The topography in some parts is of low, broadly rolling plains with isolated hills and mountain masses. This zone receives low rainfall due to the rain shadow effect. The relief is high with altitude dropping from 1,800 m in the south to less than 900 m in the north. High temperatures (90-95^o F in the dry season and 80^oF during the wet season) are experienced thus explaining the high evaporation rate. Long drought conditions are in January to February and June to July.

The vegetation is of moist, semi-deciduous *cynometra cellis* forest, moist *combretum* savannah, dry *combretum*, *combretum hyparrhenia* savannah in the higher lands in the south. It gives way to *borassus hyparrhenia* palm savannah with *themedra heteropogon* grass savannah on the lower ground, and *acacia imperata* savannah where drainage is impeded. It then gives way to dry savannah. In Moyo and Adjumani, *butyrospermum hyparrhenia* savannah, with undifferentiated moist semi-deciduous thickets on the lower ground predominates. The soils range from sands, sandy-clay-loams, and clays, of high soil productivity in the south. Productivity drops from medium to low further north. Erosion hazard is moderate to very low. The farming population per square kilometer of arable land ranges from 23 to 77 persons, while the grazing area in hectares per household ranges from 4.2 to 34.4.

1.2.2 *Vegetation and Land Use*

In Uganda, pastoral systems dynamics (in the rangelands) are largely controlled by precipitation and the availability of water to support plant growth henceforth functions of climate than of livestock stocking rates. Two patterns of distribution of annual rainfall lead to quite different conditions for pastoralism³⁴. Various forms of land use affect the rate at which there are net losses (or gains) of biomass and, therefore, carbon. Vegetation destruction – as when land is cleared for agriculture – almost invariably results in a net loss (most planted crops have a relatively low biomass); on the other hand, establishing tree plantations, or increasing the forestry component of agro-forestry, can yield an increase in biomass. There is some evidence that bird numbers increase with biomass, especially woody biomass, and this may well be true of biodiversity in general, although there will certainly be exceptions³⁵. The nature of the vegetation – which largely defines ecosystems – reflects water availability in the ground.

Vegetation in Uganda has been classified³⁶ in various ways, five major types of natural vegetation are recognized; forest, woodland, bush land, grassland and wetland. These

³⁴ Maria E. Fernandez-Gimenez and David M. Swift, 2003

³⁵ M. Okoit, et al, 2004

³⁶ by Langdale-Brown *et al* (1964) and the National Biomass Study (1996)

categories are closer in concept to biomes (communities' characteristic of broad climate regions) than ecosystems³⁷, described in the table below:

Table 1: Types of Vegetation in the Dry lands of Uganda

BIOME	COMMUNITIES	CHARACTERISTICS
Dry lands	Palm Savannas	Dominated by <i>Borassus</i> Palms, the grassland are maintained by fire
	Dry <i>Combretum</i> savannas	Fire influences this type again: <i>Acacia</i> is often present too
	Dry <i>Acacia</i> savannas	These are long-grass areas, typically with <i>gerradii</i> trees
	Grass savannas	Extensive tall grasslands, dominated by <i>Themeda</i> <i>Triandra</i> or species of <i>Hyparrhenia</i>
	Tree and Shrub Steppes	Typical of areas with 600-700mm a year of rain, with many small trees and shrubs
	Grass Steppes	Areas of short grass and bare ground, mainly in Karamoja
	Bush lands	These are characteristic of overgrazed areas which would otherwise be more open savannas
	Dry thickets	Dense spiny trees and shrubs which can become almost impenetrable

Source: Langdale Brown et al (1964)

Agricultural production is carried out based on farming systems based on agro-ecological zones, soil types and cropping systems. The climatic zones do not correspond directly with individual agro-ecological zones and a climatic zone may encompass several agro-ecological zones. Two types of fragile ecosystems are identified, namely the highlands in the southwestern, eastern, western and northeastern parts of the country and the rangelands, or cattle-corridor. The highlands are unique ecosystems, well endowed with productive soils and favorable climate hence they are densely populated and intensively used³⁸. Ecology of arid ecosystems is appreciated from an understanding of the pastoral society and the management of their livestock. Neither humans nor livestock could survive in the arid areas without the other³⁹.

No ecosystem in Uganda is completely 'natural' or 'unaffected by human activities', the degree to which ecosystems have been affected, varies considerably. Classifying ecosystems, based upon vegetation is the most practical, since vegetation is easily observed, and most other organisms – notably animals – depend upon it. In a positive sense, ecosystems are important if they support many species, especially the more important ones. However, their importance in terms of needing conservation action is greater if they are under threat, and particularly if they are small in area and inadequately represented within the major protected areas. All ecosystems provide environmental goods and services, including water and carbon.

A further aspect of an ecosystem's overall conservation importance is the particular species of wildlife that it supports⁴⁰. Many important areas in Uganda are conserved under existing laws, as Protected Areas. These fall under the Forestry Department, which is responsible for major national Forest Reserves (many smaller ones are administered locally), and the Uganda Wildlife Authority which is responsible for the management of

³⁷ Derek Pomery et al, 2002

³⁸ Margaret Rugadya, 2006

³⁹ M. Okoit, et al, 2004

⁴⁰ Margaret Rugadya, 2006

Animal Sanctuaries, Community Wildlife Areas, Wildlife Reserves and National Parks and for all wildlife throughout the country.

Table 2: Ecology of major cattle rearing areas of Uganda

Location	Administrative District	Rainfall (mm) pattern	Soil Type	Vegetation Formation	Potential Range use (1/ha) (1989)
North-west	Gulu, Kitgum, Lira, Apac	1000 - 1200mm Monomodal	Ferralsols - weathered low mineral and CEC basic sands of the A.A	Dry Grassland - Polyperennium - Terminalia/Grass layer - Hyparrhenia, Setaria, Andropogon, Panicum, Boerhaavia, Sporobolus	1990
North-west	Arua	1000 - 1200mm Monomodal	Vertisols - Fine clay sand during wet season, crack during dry season	Mixed Polyperennium-Grass layer - Panicum, Hyparrhenia, Andropogon, Cymbopogon, Boerhaavia, Setaria, Themeda, Sporobolus	240
North-west	Kotaka, Mucoko, East Soroti	900 - 1000mm Monomodal	Vertisols	Dry Grassland - Grassland-Terminalia/Grass layer Hyparrhenia, Themeda, Setaria, Sporobolus	2075
Central	Luwero, Semp. Mbombale, Matany	750 - 1250mm Bimodal	Ferralsols and Ferralsols - old-weathered low mineral reserves	Mixed Grassland - Terminalia/Grass layer - Hyparrhenia, Andropogon, Panicum, Boerhaavia, Loudelia, Chloris, Setaria	1190
South-west	Tuvura, Kumi, Iganga	1000 - 1250mm Bimodal	Ferralsols soils	Mixed Grassland - Polyperennium/Grass layer - Hyparrhenia, Panicum	885
South-west	Mbarara, Masaka, Kabale, West Mtigi	750 - 1250mm Bimodal	Lithosols - young shallow unconsolidated to eroded	Dry Grassland - Grassland/Grass layer - Cymbopogon, Themeda, Boerhaavia, Panicum, Chloris, Loudelia	1482

Source: J.S. Mugerna (1992)

2. NATURAL RESOURCE MANAGEMENT

2.1 Introduction

Pastoralism is the finely honed symbiotic relationship between local ecology, domesticated livestock, and people in resource-scarce and highly variable regions, often at the threshold of human survival. It represents a complex form of natural resource management, involving the direct interaction between three systems in which pastoral people operate, i.e. the natural resource system, the resource users system and the larger geo-political system⁴¹ The specific and different interactions among these three aspects of pastoral life define for these communities their livelihood strategies, vulnerability levels and capacities to adapt to change and respond to shocks.

Conservation strategies have mainly focused on forests and wildlife, taking into account catchments areas, conservation of biodiversity, and areas with a high concentration of rare wildlife species. There is no systematic programme to integrate the pastoralists and range resources into such general resource conservation schemes. There are no data on how different types of property regimes affect Ugandan pastoral resources with respect to conservation practices⁴².

Within the systems that pastoral societies use for natural resource management, are those concerned with property rights covering their conceptual meaning, operational aspects, and enforcement. Essentially these cover both land tenure and resource tenure. Resource tenure refers to the terms of holding and use of such resources. It constitutes the manner in which resources use rights are distributed and controlled. It defines the rights one has over the use of natural resources in relation to community. Rights do not represent relationships between a person and an object; rather they are relationships between the holder and others in respect of that object⁴³.

In the past, grazing intensity was distributed such that pasture was not depleted except during periods of drought. National level colonial reports charged that overgrazing was chronic and widespread, but districts reports disputed this pointing out that degradation of pasture was limited to periods of drought⁴⁴. For example Commissioner in- charge, Karamoja was informed of the colonial government's intent with explicit instructions below:

‘The aim of the local Administration should be to foster a spirit of complete trust and confidence in the minds of the *Karamojong*, and to this end, they should be afforded every opportunity of following their own semi-nomadic pastoral habits as far as these are consistent with peace and good order. Now *Karamojong* should ‘become less cattle-minded’ and be induced to seek occupations and interests outside the district. Indeed they believed it best ‘to remove the people altogether’, but the Administration would not allow it and it would cause problems elsewhere. Forest clearing to stop the tsetse fly spreading ‘must be prevented at all costs. Honey-hunters were doing incalculable damage to forest growth by burning trees, especially the Ik north of Kamion whom Wayland

⁴¹ Michele Nori, Jason Switzer and Alec Crawford ()

⁴² W. Kisamba-Mugerwa, 1992

⁴³ Margaret Rugadya, 2005

⁴⁴ For example in Karamoja, in 1923, Aciya, a government chief had been murdered by a crowd of *Karamojong* men and women for officially preventing their cattle moving away to the dry-season grazing, a report was made giving realistic appraisal of the overall conditions, observing that the only hope for commerce was in livestock products, and that was dependent on the control of disease. The people “were not agriculturalist, were unlikely to provide useful recruits for the military and police or laborers outside their own areas

(1931) misnamed Wanderobo: ‘they are a very small tribe and will have to be moved in any case’⁴⁵.

While there has been too much fixation on movement only as movement in pastoralism, the preoccupation with tenure has been to focus too much on stability and security to the exclusion of negotiation and change. The problem with land tenure is the reverse of the problem with mobility⁴⁶.

2.2 Strategies for Resource Management

Pastoralists employ a range of strategies that have enabled them to persist for centuries, and in some cases millennia, by harvesting native vegetation with domestic herbivores. Range management as a science-based management tradition has articulated four major principles or variables that must be taken into account:

- i. stocking rate (grazing intensity);
- ii. kind and class of animal;
- iii. timing of grazing; and
- iv. spatial distribution.

Pastoralist strategies tend to focus on the latter three principles rather than the first. In addition, social relationships of reciprocity are an important dimension of many pastoral management systems, since these relationships, and the moral economy that underlies them, help ensure that pastoralists have access to the resources they require to implement mobility, reserves, flexibility, and diversity⁴⁷.

Table 3: Pastoralist Resource and Management Strategies

Range agro-ecology	Pastoral socio-economics
Resource pattern:	Resource management:
Spatially heterogeneous	Mobile livestock keeping
Highly seasonality	Communal tenure rights
Differing through time	Flexibility and reciprocity
Unpredictable climatic patterns	Contingency responses

Source: Michele Nori, Jason Switzer and Alec Crawford

2.2.1 Diversity of Habitats and Livestock Species

Diversity emerges as a strategy in terms of both the kinds and classes of livestock kept, and the range and heterogeneity of habitats exploited by pastoralists. Because different livestock have different forage and habitat preferences, these two diversity strategies are closely related in multi-species systems⁴⁸. First, their entire grazing territory must encompass habitats suitable for use in all seasons. Second, within any given seasonal grazing area, they prefer to have a diversity of habitats and vegetation communities available to match the forage preferences of different livestock species.

In Uganda, herders keep a diversity of livestock species traditionally five kinds of livestock are kept: camels, donkeys, cattle, sheep, and goats. The reasons for keeping a multi-species herd are that:

- i. Different animals have different forage and habitat preferences, and water requirements, allowing for efficient (complete) harvest of the available vegetation

⁴⁵ Ben Knighton, 2005

⁴⁶ Jennifer M. Olson, et al , 2004

⁴⁷ Kent H. Redford, 2006

⁴⁸ Kent H. Redford, 2006

resources. The varied habitat and diet preferences of different species also may minimize competition among species, allowing for a greater number of animal units to inhabit the same landscape than if only one species were used.

- ii. Drinking water for livestock is often poorly distributed during the dry season, the differential watering requirements of the different species of stock and the differences in mobility among them determine how far from water the animals can be taken to graze. Thus, cattle exploit forage resources at great distances from water, while smaller stock such as sheep and goats have a more restricted grazing radius around a water source.
- iii. Keeping a diverse herd is a risk-mitigation strategy. Different species have differing susceptibilities to disease and environmental stressors (e.g. extreme cold, heat or drought), increasing the probability that some part of the herd will survive any given disaster or change in the environment.
- iv. Keeping a variety of different animals provides the pastoralist with more different livestock products and services, and in some cases, extend the season for harvesting products such as milk, which can be obtained from several different species that differ in gestation and duration of lactation.
- v. Keeping a diverse herd also provides labour opportunities for a larger cross section of the pastoral population. Small stock can be herded by small children, while cattle and camels are generally under the keeping of older boys or young men (and occasionally, women as well). When a herd owner has a mixed herd, all members of his family can contribute labour to the pastoral enterprise.

The *Karamojong* appreciate animals of reasonable size and body weight, with good milk yield, high calf production, certain colours, and disease resistance. The different breeds within the herds are recognized, although they do not give them specific names. The *Karamojong* cattle are of the same type zebu, with upward-pointing humps, large body size and weight, blunt snouts, resistance to heat, some tolerance to cold, well-developed dewlap very prominent in bulls. Their colours include white/ cream, grey, roan, dark/dirty brown. Black colour is a recent development from interbreeding. Some *Karamojong* groups call their animals' *ngalok*'⁴⁹, though most describe them as 'Karamojong cattle'. The *Karamojong* try to maintain their breeds by some controlled breeding. Undesirable males are castrated, sold off or even used to pay a debt. It is common for one herder to borrow a desirable bull from his neighbour for breeding purposes for a few weeks⁴⁹

Among the *Bahima* in South Western Uganda, cattle are given individual names, which precisely describe them to ease management of herds. These descriptions are based on phenotypic characteristics (coat colour and patterns, sex, shape of the horns, special marks or distinguishing features), behaviour, and others characteristics, including ancestry, association with a special event and mode of acquisition (e.g. a gift). A name's prefix indicates whether an animal is a heifer, a cow, or a bull. For heifers, names start with *Ka*, for bulls whether young or old with an *R*, and for cows any other letter, except for the brown-white coloured cow called *Ruhuzumu*. It is noted that being able to distinguish between the light brown (*siina*) and the dark brown (*mbindi*), makes it possible for breeders to select the right cows and bulls to produce animals of the favoured dark reddish brown colour (*bibogo*). This fine description of an individual animal makes it possible for the *Bahima* to trace back the genealogical relationships of their cattle as far

⁴⁹ Thomas Loquang, 2003

back as ten generations. Great care is taken in selecting the bull of the herd (*engundu*), eating of male calves is in effect a method of breeding control as only the best males are preserved for breeding purposes. There is hardly any selection pressure on female animals⁵⁰.

Table 4: Selection Criteria for Breeding Bulls among the Bahima

Feature	Desirable characteristics	Remarks
Horns	Large, long, heavy, well balanced, wet glow on them, white all the way to the tips, graceful curving (outwards and upwards and finally inwards – <i>Orukondo</i>)	However perfect a cow may be in other regards, if it does not have good horns it cannot be considered beautiful. Black cows are avoided because it is almost impossible for them to have glowing white horns
Colour	Varies but the favourite one is dark reddish brown – <i>bihogo</i>	Ideal is a single, unbroken colour
Body	Big and tall	
Neck	Big	
Dewlap	Big	
Chest	Wide, straight, firm	
Hump	Small	Belief is that the bigger the hump the more feed is wasted by being stored there
Coat colour	Not dry, smooth, shiny	
Rump	Wide and beefy	
Hooves	Big	Belief that animals with big hooves give high milk producing offspring
Legs	Long and big	Able to move long distances
Testicles	Big and equal in size	Bull with one testicle highly valued because of belief it will have many female offspring
Penile sheath	Big	
Rudimentary teats of the bull	Big	Believed to produce offspring with high milk production
Temperament	Good	
Milk production	High	On basis of pedigree
Milk quality	High butterfat	On basis of pedigree

Source: Helen Nakimbugwe and Charles Mchunguzi, 2003

2.2.2 Mobility

Pastoral mobility requires movement over different scales depending on variable temporal and spatial range production patterns. It depends on the presence of temporarily utilized lands, knowledge of ecosystem productivity potentials (and constraints), and capacities to negotiate or enforce access to these resources. It therefore critically hinges upon technical as well as sociopolitical factors:

- *Knowledge* – In-depth pastoral knowledge of complex rangeland agro-ecological dynamics is critical in detecting resource availability to ensure livelihood strategies and coping mechanisms accordingly. This knowledge includes understanding erratic climatic patterns and familiarity with patchy range resources. Water availability is often the limiting factor in pasture utilization, whilst wild fruits and nuts, medicinal plants, and salty areas provide important supplemental food resources for pastoralists.
- *Access* – The political ecology of herding involves social capital and negotiating capacities. Through principles of flexibility and reciprocity, these factors play a

⁵⁰ Helen Nakimbugwe and Charles Mchunguzi, 2003

critical role in ensuring access to different range resources in times of need, and provide for critical options of dispute resolution during periods of stress and other forms of shock. Accessing resources and services of neighboring communities is therefore a vital element for pastoralists⁵¹.

All pastoral movements involve complex decisions. In fact, the herder's production technology is very complex. It includes the spatial and temporal variation and interrelated dynamics of water, vegetation and other key resources all too often lumped misleadingly together as the external environment as well as the links between this variation and dynamics and the livestock behavioral and physical characteristics⁵²: Opportunistic movements are often undertaken to avoid disaster, such as drought, or wildfires, or to limit exposure to insects or disease, these movements often are not planned and constitute a deviation from the regular pattern of transhumance⁵³.

Mobility is a defining characteristic of most pastoral systems. Pastoralists move herds and often households at several spatial and temporal scales. Movements may be nomadic, in which the pattern of movement is opportunistic and varies each year, or transhumant, in which a regular pattern of movement is repeated year to year, with relatively minor variations. Transhumance may be elevational, latitudinal, or otherwise driven by the availability of dry and wet season water and forage. Seasonal and inter-annual movements vary in scope, but in highly variable arid and semi-arid ecosystems. Transhumant movements enable pastoralists to exploit the heterogeneity in their environments at a larger scale, matching the seasonal nutritional and physiological demands of their herds to the available resources.

Aggregate patterns of mobility of many households over a landscape often result in seasonal patterns of clustering and dispersion of herds and households, as people convene when forage is lush and abundant and disperse when it becomes scarce. This type of pattern is found where water sources are not a limiting factor. In other cases, where dry season water is limited to a few widely scattered sources, during the dry season and disperse in the wet season when ephemeral water sources scattered across the landscape permit greater mobility.

Mobility on a smaller spatial scale is also employed as a strategy by some pastoralists. However, the detailed choreography, or day-to-day dynamic mapping of movements, resembles rest-rotation schemes, albeit less strictly organized, and because of the twin factors of dispersion and frequent movement, it contributes to pasture sustainability. Traditionally, range-improvement techniques relied on fire, modifying the grazing behavior, and therefore the animal-plant relationship; and changing the herd composition. None of these techniques is feasible unless herds are mobile⁵⁴.

Writings on *Karamojong* pastoral production⁵⁵ in the 1960's reveal a highly flexible pattern of movement and cattle-camp configuration: "Most *Karamojong* herd-owners have no clear idea of where the next dry season will find them, or in whose company. The men who occupy adjacent cattle-camps, or even the same one, may be drawn from entirely different sections". The annual pattern of movement of the cattle-camps herd is such

⁵¹ Michele Nori, Jason Switzer and Alec Crawford ()

⁵² Emery Roe, Lynn Huntsinger and Keith Labnow, 2005

⁵³ Kent H. Redford, 2006

⁵⁴ Maryam Niamer-Fuller, 1998

⁵⁵ Dyson Hudson's, 1966

that at the beginning of the dry season—that lasts from October to March—most cattle-camps are scattered around the wetter southwestern belt of Moroto District or near water-retaining areas at the mountain foothills of the Kadam and Mt. Moroto ranges. As the dry season advances, cattle-camps congregate in large groups around the most reliable water points.

When rain starts to fall in March and April most dry season grazing areas are abandoned and the large congregations of cattle-camps split up in order to use temporary grazing and water resources in dryer areas that cannot be used in other periods, nor be cultivated. These areas allow nutritious, salt containing grasses to emerge immediately after the first rains have started to fall. During the wet season, the flow of a river is followed, often in the proximity of the permanent settlement area. Herds are literally moved downstream to use available rainfall to the maximum. When the rains decline and temporal supplies of grass and water are almost exhausted, herdsmen will set fire to the long grasses in their dry season grazing areas, so that fresh, nutritious growth will emerge, enabling them to return here⁵⁶.

Embarking on the nomadic life each year is seen by the herdsmen as liberation for both them and their cattle. They roam as far a field as they need in order to satisfy their appetites. Together they represent the future well-being of society; the herdsmen are the rising generation and the herds are the social and economic capital⁵⁷. In this sense, mobility is an effective tool for range improvement, as it provides the herder flexibility to modify herds, and access to alternative pasture areas, while waiting for spontaneous regeneration of degraded pastures.

2.2.3 *Opportunistic Use of Grazing Reserves*

Many pastoralists, particularly those who repeat the same seasonal movements year after year, set aside areas as grazing reserves to be used during the dry season, or in some cases, for use exclusively during forage availability crises (droughts weather). Reserve areas may be explicitly set aside, or they may be *de facto* reserves that result from minimal use of areas that are difficult to reach or otherwise unappealing to herders⁵⁸. Many transhumant groups had range reserves that were used as fodder banks for bad times, or as deliberate enclosures for ensuring spontaneous regeneration.

One important mechanism that allows opportunistic use is the “tracking” of ecological variability, both spatially and temporally. Herders and scouts track the ecosystem by constant monitoring and adjust the behavior of their animals accordingly. Tracking is possible if there is freedom of movement, and specialized labor and talent for tracking and evaluating ecological processes. Scouts must monitor indicators that are sensitive to ecological changes. Indigenous indicators are sensitive to both the variability in the ecosystem, and its condition at any point in time.

Opportunistic utilization of the ecology a highly adaptive strategy to the space and temporal fluctuations of the environment, by moving around herds of cattle, resources (pasture, water, salt) are used where and when they are most available. All habitats are used and there is no functional distinction between wild and agricultural lands. Pastoralists have a complex strategy of customary arrangements to commonly manage

⁵⁶ Reuben de Koning, 2003

⁵⁷ Ben Knighton, 2005

⁵⁸ Kent H. Redford, 2006

and use these resources based on their extensive knowledge of the ecosystem⁵⁹. An opportunistic stocking strategy requires that mobility patterns adapt to both herd sizes and variability in primary productivity. High primary productivity in good years provides an incentive to herders to reduce mobility, but they have to balance that with the needs of a larger herd. A smaller herd could be kept closer to home, but in bad years may need to be taken further a field to reach pockets of good feed⁶⁰.

It is argued⁶¹ that the *Karamojong* use resources as they become available and that dry-season pastures are not set apart for use later. It would be difficult to reject the hypothesis that conservation outcomes observed among pastoralists are largely the epiphenomenal consequence of high mobility, low population, dispersed water sources, disease avoidance, and security issues. The fact that grazing regulations exist and moots sit to punish violators suggests, however, that infractions do occur. This suggests that although protecting grazing reserves may be a strategy that makes long-term economic sense, it may not be in the short-term interest of all individuals⁶².

2.2.4 Flexibility

Flexibility is a general strategy that is manifested in a number of specific ways, such as inter-annual variation in movement patterns, herd splitting, emigration, and flexible social organization. Pastoralists that practice transhumance may vary the time of seasonal moves or the destination, depending on pasture conditions. Herd splitting is common tactic that illustrates flexibility. Many pastoralists occasionally split their herds into smaller groups, sometimes by species. Segregating herds by species may enable stock to gain access to more suitable forage for that species. Herd splitting may also reduce risk of losses due to disease, predation, drought, or raiding. Herds are also split seasonally, such that animals that are not used much in a particular season (for example, camels in summer) are turned out to graze at will, while others are tended close by. During lactation, the milking stock are kept close to the encampment, as are the young of the year, while mature, dry animals are grazed at greater distances. Similar practices are undertaken by other pastoral peoples.

The *Karamojong* in the north eastern part of the country, divide their cattle, into a camp herd and a settlement herd. The *Karamojong* breed cattle, sheep, goats, donkeys, and camels (camels are kept only by the Pokot in South Western Karamoja). As long as water and grazing are available near the home settlement area, a considerable number of cattle are kept in the permanent settlement. The settlement herd is sent out to graze each day and brought back to the settlement at night⁶³. When pasture resources are depleted around the settlement area during the dry season, the settlement herd may be moved away. Still the herd is kept as close to the settlement area as possible so that villagers can easily collect animal products. Whereas the settlement herd is returned homewards as soon as water and pasture conditions in the settlement zone have recovered⁶⁴, the cattle-camp herd, is in most cases further away in the peripheral grazing areas, located at the fringes of the tribal or sectional territory⁶⁵.

⁵⁹ Ahmad Y, 2003

⁶⁰ Maryam Niamer-Fuller, 1998

⁶¹ In Dyson-Hudson, 1969

⁶² Lore M Rutten and Monique Borgerhoff Mulder, 1999

⁶³ Dyson-Hudson, 1966

⁶⁴ Reuben de Koning, 2003

⁶⁵ Thomas Loquang, 2003

The variable environment necessitates continuous reallocation of access rights that define macro-mobility (or long-distance routes and seasonal grazing areas). 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, too, is continually changing as labour is allocated and reallocated between management units. For example:

A *Karamojong* pastoralist manages his herd and family in “mutual association”. Families recognize a household head (usually male) that has most of the apparent responsibility for herd management decisions. All family members engage in herding activities. Children are especially important for the day-to-day maintenance of animals. There are also traditions for mobilizing work parties or age groups according to the age grades of young women with a female leader or young men with a male leader ⁶⁶

Compositions of households and herding camps change seasonally and annually, depending on economic conditions and social demands. This flexibility in social organization is essential to household survival in many cases⁶⁷. Flexibility can be maintained by the legal recognition and development of appropriate legal language for nested property rights, communal stewardship rights and duties, fluid boundaries, inclusively, and the concept of priority of use.

2.2.5 *Reciprocity*

Traditional African processes of reciprocity and negotiation are used in three basic kinds of resource management decisions: conservation, regulation, and allocation⁶⁸. Reciprocity, like flexibility, is a general strategy that finds expression in a number of pastoral practices and institutions. Reciprocal relationships are not always, and perhaps not often, balanced or simultaneous exchanges and may take the form of patron-client relationships. Reciprocal exchanges are non-monetary and typically consist of the exchange of favors, privileges, services, etc. that are difficult to value or keep accounts on. Reciprocal relationships are important not only in the day-to-day practices that they support. Reciprocal transactions themselves are key to building and maintaining interdependence among individuals and groups and accruing “social capital”⁶⁹.

Reciprocity has been shown to be the backbone of interdependence and collective action in pastoral societies⁷⁰. Livestock lending and reciprocal pasture access are two examples of reciprocity in action. Livestock lending is a common practice in many pastoral societies. A household with surplus milking stock may lend a milk cow to a poorer household on a temporary basis, for example. In exchange, they provide herding labor out of proportion to the number of stock in their own herd. Typically, the livestock belonging to all the households in the camp are pooled into one herd and each household takes the animals to pasture in turn. Access is seldom, if ever, denied, with the expectation that reciprocal privileges will be provided when the circumstances are reversed. Without the norm of reciprocity, flexibility in movement would often be much more difficult to implement. Being granted access to the grazing territories of a neighboring tribe or section implies welcoming the hosting communities whenever they run short of water and pasture resources⁷¹.

⁶⁶ Dyson-Hudson, 1966

⁶⁷ Helen Nakimbugwe and Charles Mchunguzi, 2003

⁶⁸ Maryam Niamer-Fuller, 1998

⁶⁹ Kent H. Redford, 2006

⁷⁰ Maryam Niamer-Fuller, 1998

⁷¹ Reuben de Koning, 2003

Reciprocity is fundamentally the basis of market exchanges, which is codified into contracts and monetary transactions. In the context of managing mobility, therefore, transactions can be negotiated either through customary institutions of reciprocity and political alliances, or they can be based on a system of reciprocated fees and permits. Both reciprocation, and the threat of denial of reciprocation, is powerful tools for ensuring respect of collective rules and regulations. In other words, the social and administrative boundaries of a community need not coincide with its ecological ones

2.3 Conservation in Resource Management

The question of whether a group of people is “truly conservationist” requires attention to a complex of historical and cultural factors—the broader question of the relation of ideology to adaptations. It appears that social learning and cultural evolution based on ecological knowledge, often following a resource crisis, are the major ingredients of developing conservation-oriented practices⁷². Such a view of the evolution of conservation makes a distinction between invaders and natives. When humans invade a new and unfamiliar ecosystem, their impact on the environment may be substantial initially, but this initial relationship may change as they develop a knowledge base, learn from their mistakes, and come to terms with the limits of their new environment. A knowledge base takes a long time to develop and practices based on such knowledge even longer.

Pastoralist communities are commonly credited with practicing a conservation ethic. There are numerous detailed observations of herdsmen following grazing regimes, observing stocking regulations, and maintaining institutional land use practices that seem to protect grasslands from overuse⁷³. Conservationists evaluate success in ecological and environmental terms (e.g. protection of habitat from degradation by increased human and livestock populations), while rural development specialists tend to use socio-economic criteria (e.g. reduced conflicts over natural resources, improved access to resources, and new activities for income generation). Socio-economic evaluations tend to aggregate costs and benefits, and fail to capture the indirect as well as direct impacts on rural livelihoods, their distribution between different groups, and the preconditions for engagement in certain activities.⁷⁴

Conservation in pastoralism is mainly concerned with the “harmony” that pastoralists establish with nature, seen as a loose bargain between two highly volatile competitors than a reciprocal vow between docile partners⁷⁵. What are of interest are adaptive institutional responses to ecosystem dynamics for conservation. A key contribution is demonstrating that pastoral conservation practices conjoin individual and collective interests as herders coordinate their behavior to make the most of the rich but meager resources they are allotted by history and chance.

Most anthropologists still hold that prudence is a *goal* of subsistence hunters, as embodied in their conservation ethic and knowledge of natural history. Accordingly, indigenous peoples are attributed the reputation of being natural conservationists “ecologically noble savages”. As might be expected, evolutionary ecologists question whether indigenous peoples are natural conservationists, because individuals cannot be

⁷² Lore M Rutten and Monique Borgerhoff Mulder, 1999

⁷³ Lore M Rutten and Monique Borgerhoff Mulder, 1999

⁷⁴ Charlotte Boyd, et al, 1999

⁷⁵ Kent H. Redford, 2006

expected to limit present harvests of resources for conserving them for future use if this behavior entails a cost. The rationale of this critique is that such restraint is altruistic if the benefits are shared by all but the costs are borne individually. Thus, the notion of conservation entails all the theoretical problems associated with the evolution of cooperation, altruism, and collective action⁷⁶.

Ethno-botanists are the most vocal proponents of the view that indigenous people possess an intrinsic conservation ethic. Central to this debate are the problem of how to identify conservationist. While social scientists have documented instances of restraint in the use of resources, those who adopt an evolutionary perspective are challenged to identify the selective mechanisms whereby such altruistic conservation acts might be maintained in a population⁷⁷. It is important to distinguish between hunting and gathering in relation to conservation efforts of pastoralist, well as it is affordable to restraint in the harvest of plants today for the future because by comparison, plants are predictable in time and in space, this may not be true for game (mammals and birds) which are commonly unpredictable in time and space, and often highly dispersed, or sometimes migratory. For this reason, restraint today may afford no future benefit to the restrainers, once one focuses on game it becomes easy to reject the proposition that pastoralist are conservationists.

Conservation outcomes observed among pastoralists are largely the epiphenomenal consequence of high mobility, low population, dispersed water sources, disease avoidance, and security issues. The fact that grazing regulations exist and moots sit to punish violators suggests, however, that infractions *do* occur such as those observed among the *Karamojong*⁷⁸. The conventional thinking informed by notions of ecosystem equilibrium, pastoral irrationality, and Hardin's tragedy of the commons now stands challenged.

Empirical evidence suggests that the proper management of natural resources must be seen both from the point of view of "protection" and "production". While the natural resources are being protected, they must also be made more productive. The test of sustainability lies in the proper mix of protection and production.⁷⁹ In sum, the use of pastoral resources is based on a complex set of temporary or more permanent claims on pastures, wells and other resources (salt licks, for example), and on underlying principles of flexibility and reciprocity.

Mobility and flexibility, in turn, require large spatial extent for grazing management, and favour heterogeneous environments. Mobility, together with the use of diverse species to harvest diverse habitats, enhances the efficiency of forage harvest and conversion into livestock products. Mobility can also be viewed as a risk avoidance strategy, when moves are undertaken to escape environmental, political, or economic conditions that threaten the well-being of herds or people. Finding ways to maintain and strengthen such mobility is crucial for the survival of pastoral communities, and calls for the pastoral herders to "modernize" and settle down would mean death to pastoral livelihood systems which have proved productive and sustainable, despite harsh and risk prone environments⁸⁰.

⁷⁶ Kent H. Redford, 2006

⁷⁷ Lore M Rutten and Monique Borgerhoff Mulder, 1999

⁷⁸ by Dyson-Hudson, 1969

⁷⁹ Ahmad Y, 2003

⁸⁰ ECAPAPA, 2005

3. INSTITUTIONS FOR MANAGING NATURAL RESOURCES

Understanding institutions begins with a view on the social structures through which access and use rights to natural resources are negotiated, these often display a certain pattern of behavior and generate norms, rules, and principles.⁸¹ Institutions are the repeated patterns of human behavior over time that structure human interactions⁸². The sustainability of pastoral systems is threatened largely by the loss of institutions that support sustainable practices⁸³. Colonial and post-colonial economic and social changes have severely affected many traditional and local resource management systems, through expropriation of (property especially land), displacement of communities and new market pressures.

3.1 Introduction

Indigenous pastoral resource management systems are commonly based on distinctive customary rules governing access to resources and rules concerning control of resource use, they are not mere traditions but adaptive responses that have evolved over time, often based on kinship, social classes, or other ties frequently determined rights of access. The control tier of is vested in a clan chief or a council of tribal elders, who would determine the nature and level of resource use. Customary institutions rely on negotiation for their maintenance and evolution⁸⁴. The notion of negotiation is essential in the setting up of “sustainable” relations between the different types of users and the environment.” Customary practices are based on peer-group pressure, social custom, and can oscillate to harder legal norms depending on environmental conditions and resource scarcity.

Pastoral people’s direct reliance on their environment can spur the formation of indispensable customary rules to govern resource harvesting to avoid environmental depletion and sharing of nature’s bounty. The inclusive (or porous) nature of transhumant tenure institutions has often been misread as evidence for the lack of institutions governing resource access— for example, a resource open to all. Such conclusions confuse a lack of rigid exclusion (a defined membership) with the lack of exclusionary powers. In fact, outsiders can only use resources with the permission of the group with usufruct rights⁸⁵. It is observed⁸⁶ that networks of rights and obligations have served to instruct functional social groups, collective norms, and sanctions.

By appropriating pastoral resources and limiting the role of local-level pastoral institutions, state ownership has often fostered land use conflicts and the breakdown of collective action within and across pastoral groups. In particular, where the state claimed ownership but expended limited resources to manage rangelands or relied on bureaucrats to implement management schemes without knowledge of local resources and institutions, many land use conflicts have arisen and resources have become degraded⁸⁷. Customary socio-political systems have been subsumed under the hegemony of the central state (nation), leading to a weakening of the traditional leadership, and a fragmentation of authority. The customary judicial system has been relegated to deal with relatively minor internal conflicts. Communally held land (the ownership of which was

⁸¹ Reuben de Koning, 2003

⁸² Kent H. Redford, 2006

⁸³ Maria E. Fernandez-Gimenez and David M. Swift, 2003

⁸⁴ Lore M Rutten and Monique Borgerhoff Mulder, 1999

⁸⁵ Maryam Niamer-Fuller, 1998

⁸⁶ By Ruttan and Borgerhoff Mulder, 1999

⁸⁷ Tidiane Ngaido and Nancy McCarthy, 2004

generally vested in a deity) has been abrogated by the nation-state, often under the pretence that they are not being put to productive use, resulting in a breakdown of common-property regimes.

3.2 Social Structures and Relations

Among the Karamojong, authority is not centralised in one single organ, but operates through the elders in their different localities, though always according to the same procedures. To appropriate powers all *Karamojong* males go through a series of age and generation sets. These age sets function as bonding mechanisms between the different territorial groups that comprise the *Karamojong*, but also between the *Karamojong* and neighbouring peoples with similar age set structures. There are five age sets—the interval being about five to six years—that comprise one of the two generation sets: the elders, and the juniors. A man's first initiation is called *asapan*, whereby a young man is admitted to the organisation and earns voice in assemblies, the *akeriket*⁸⁸.

Once initiated into the junior generation set, a man passes to the following age set every five to six years. He will remain in the fifth age group of the junior generation until generation sets turn over. This happens when the members of the ruling generation set have been reduced in number and have become very old. Power is transmitted to the junior generation set at a ceremony called *akidung amuro*⁸⁹. The elders' generation, *ngikathikon*—in the current situation—bears the connotation of already 'retired' leaders. Although they are still consulted, they cannot be up to date on all affairs going on in the cattle-camps, let alone take lead in decision making here.

In the cattle-camps the last two age groups of the junior generation set have operational authority and are referred to as the kraal-leaders. Among these, the *arwonit* are highly respected kraal-leaders. Their power and prestige is determined by the amount of cows they possess—something that shows their personal skills and rightful interceding with the ancestral spirits. At so-called *ekokwa* meetings these middle-aged and senior *arwonit* take lead in decision making on when and where to shift next (for grazing) and in what formations. Furthermore they lead negotiations on communal grazing with other sections or tribes. Although movement and yearly alliances of kraal-leaders are fluid and opportunistic, each has a specific pattern of movement. The starting point is the main settlement area of his section, following specific water points towards a specific dry season grazing area⁹⁰.

In fact, kraal-leaders do not decide or force a decision like a chief or big man—rather they lead the process of decision-making. Because of the egalitarian character of decision making final decisions or arguments often need to come from the supernatural (outside the individual) to be valued and accepted⁹¹. Several offices can intercede between the natural and supernatural world. First, an *Ekawaran*—the highest possible position of an elder—has the capacity to see future events and even more important, to avert or encourage them. By his prophesies he can make rain or cause dry weather, bring health and disease, and avert disasters such as raids. The second, an *Emuron* interprets and receives dreams, visions, and other signs. These readings are particularly interesting because they may directly influence the pastoral cycle of where to settle, what places to avoid and when to move. Third, an *Ekataman*—meaning good thinker—does not

⁸⁸ Reuben de Koning, 2003

⁸⁹ Dyson-Hudson 1966

⁹⁰ Niamir-Fuller 1999

⁹¹ Reuben de Koning, 2003

specifically have a diviner's role, but is consulted for his or her experience and specific knowledge⁹².

Among the *Karamojong* nothing is feared more than being cursed by the elders. It means that the person involved is being badly disposed by the gods⁹³. Although the power of the elders seems strongly embedded in *Karamojong* society, It is noted that the egalitarian and all encompassing character of the elders' authority has been affected by the rising of a few militarist kraal-leaders two gained more success than others through banditry and raids. It is pointed out that modern leadership is trying to establish a niche of its own, thereby pushing aside the elders' authority, for example the elected local council chairmen, civil leaders, parliamentarians, and intellectuals.

Karamojong have long had these institutions and processes: the age-class system, the elders' assembly, and the contingent decisions of family herders and cattle-camp leaders, which ensure a mobile spread of grazing while set within a non-hierarchical but highly communal society that builds much mutual reciprocity through exchanges and gifts of livestock. Peaceful relations are expressed by intermarriage, joint cattle-camp movements and shared ceremonies. Conflict relations are accompanied by cattle rustling and straight out warfare. Social relations between the different territorial groups—whether sections or tribes as a whole—are of major importance when considering the mode of habitation and the pattern of movement⁹⁴.

3.3 Territorial Management

The *Karamojong* are transhumants and their production system is a dual system in which life ideally revolves around two locations at the same time: the permanent settlement (*ere*) where predominantly agricultural production takes place and the mobile cattle-camp (*avi*) where pastoral production takes place. The two productive spheres are in no way separate but are connected through family relations. Individual *Karamojong* families are active in both production forms—with men ideally spending most of their time in the cattle-camp and women, children and elderly people taking care of the homestead and the adjacent gardens. This division of labour between men and women, however, is not static⁹⁵.

The settlement cluster, or *ngereria*, is the smallest form of territorial it consists of several fenced settlements (*ere*) that house up three to six families on average. The basis of the *ngereria* is common residence in a certain geographic area, which has bound several single *ere* together historically. The *ngereria* functions as a common interest group. Cattle owners from one *ngereria* often migrate together and its members manage and use communal resources such local pastures and woodlands. The *Karamojong* are again subdivided into various territorial sections—called *ekitela*—with three dominant ones in Moroto for example are: the Matheniko; the Bokora; and the Pian. These are subdivided into, called *ekenoi*, which are further territorial identifications. Territorial identity has become increasingly prominent over the last decades. For example, grazing rights and conflict relations are negotiated at the sectional level instead of the tribal level⁹⁶.

⁹² Reuben de Koning, 2003

⁹³ Reuben de Koning, 2003

⁹⁴ Reuben de Koning, 2003

⁹⁵ Reuben de Koning, 2003

⁹⁶ Reuben de Koning, 2003

The *Karamojong* also share settlements or villages (*ngirerya*), kraals (*ngawuiyoi*), taboos, customs (*ngitalio*), shrines (*ngakiriketa*), watering points, dams (*ngakare, namatatain*), pastures, farmland (*ngamanat*), and marriage ceremonies (*ekiitan*). The elders (*ngikasikoi*), soothsayers (*ngimuruok*) and foretellers (*ngikadwuarak*) not only act as mediators or arbitrators on daily issues but also communicate with God on behalf of the community. Herds' boys (*ngikeyokok*) and warriors (*ngikarachuna*) defend the entire community and its resources⁹⁷.

Table 5: Territorial Groups and Resources among the Karamojong

Level of territorial organisation	Location of pastures used in common	Nature of ownership
Ere (single settlement)	Where ere is large and distant from other ere, it may exclusively use nearby grazing and water resources. (dry- and wet season)	Negotiated but very probable access for members of neighbouring ere with whom the ere comprises the ngereria.
Ngereria (cluster of villages)	Local year round grazing areas for domestic cattle and goats (dry- and wet season)	Negotiated access for members of neighbouring ngereria, and occasionally for moving cattle-camps
Subsection or cluster of ngereria	Mid distance grazing areas for cattle-camp cattle (usually accessed in wet season).	Negotiated access for non members but on temporal basis
Section and Tribe	Peripheral long distance grazing areas for cattle-camp cattle (usually accessed in dry season)	Negotiated access for non members but on temporal basis

Source: Reuben de Koning, 2003

The most important trend refers to the quality of intertribal and intersectional social relations. When these are peaceful, herdsmen from different tribes and sections can approach each other closely or even utilise resources found on the other party's territory. For example between the Matheniko and Pian in Moroto District section reciprocal grazing relations were developed; and around Sogolimen and Omaniman different tribes were able to approach each other closely and even graze together because of improved relations between the Matheniko and the Tepeth and between the Pokot and the Pian. However, when relations deteriorate, then negotiations become inflexible, rights are refused and land use becomes more exclusive.

3.4 Grazing Management

Among the *Karamojong* when the grass around the settled areas begins to dry up, the cattle herdsmen become restless, wanting to move away to the dry-season grazing lands with their herds. As the herdsmen grow restless, one of them, an *esorokit*, asks for a council (*atukoŋ*) to decide a lunar date for *akivodokin* (the traditional institution of 'freeing the cattle'). Until this happens, it is an act of willful disobedience, punishable by a beating or the sacrifice of an ox, to take cattle off to the dry-season pastures. Oxen are sacrificed to please the elders, who divine the propitious occasion. A facilitator (*ekeseran*) is appointed to announce and organize the assembly, so that all the males may attend the sacred grove of the section with as many herds as possible- no mean operation. The elders feast on the sacrificial oxen and gourds of milk. The herdsmen and the stock in their care are blessed with the *chyme* and the elders' prayers, then the herdsmen leave, in the accepted order of clan or locality, through the brushwood gate and are given a clay spray blessing and a token beating with a switch to remind them of their duty to the elders⁹⁸.

⁹⁷ Thomas M. Loquang, 2003

⁹⁸ Ben Knighton, 2005

Group membership in cattle-camp movements is flexible and convertible. An individual herd-owner may choose to stick together with his current neighbours this year, whereas next year he will accompany affiliates and friends whose settlements are located elsewhere, possibly in another subsection or section⁹⁹. Despite this individual flexibility, a relatively stable pattern of cattle movement has developed at the sectional and sub-sectional level—with territorial groups that claim access to land for grazing with various levels of exclusiveness.

It is noted that¹⁰⁰ the *Karamojong* establish by sheer repetition an accepted process in which groups separate territorially from an erstwhile containing society and go their own way—in hostility, in neutrality, in friendship, but in any case independent'. As a result of the separation of sections, each of these sections has tended to appropriate rather exclusive user rights over certain pasture resources that were located in relative close proximity to the sectional heartland. This separation structures the grazing pattern and can therefore be accounted as an institution in the sense of a regularised pattern of behaviour. However, the accepted process of separations and enclosure can be overruled because—inherent to the history of separation—there is a rather strong belief in a point of common origin. As a result of tracing common origins and remembering shared grazing periods sections and tribes can legitimately claim access to resources that are located on the fringes of and even beyond their territories of predominant use.

In summary, the 'history of use'—as an institution guiding peoples behaviour—reveals a process of separation and enclosure of land at a sectional level, while at the same time it can support claims to resources outside the territory of sectional dominance. It reflects trends of both exclusion and inclusion¹⁰¹ the demand to reach resources beyond the territory of predominant use is not only explained by people tracing common origins. One shared principle structures people's behaviour in grazing matters: the principle of opportunistic management. Generally the tendency of inclusion prevails. Unfortunately, several social trends—besides tendencies of separation and exclusion—have affected people's freedom to utilise resources where and when available. The access rights to pasture and water resources are mainly based on group membership, history and opportunistic behaviour¹⁰². This implies that every cattle owner is entitled to access resources where and when available, in order to sustain his herd. In the 'non-equilibrium' ecological system of Karamoja where resources are distributed unevenly, this strategy assures that people can optimally benefit from available resources found inside and occasionally beyond the tribal territory¹⁰³.

The gradual disintegration of customary institutions responsible for managing natural resources has provided the opportunity for proponents of privatization to push through their particular agenda of land reform, resulting in widespread alienation of land. In territorial groups are the social structures through which access rights to grazing lands are negotiated. By being a member of a certain tribe, section, sub-section or *ngereria*, individual herd-owners acquire access to pasture and water resources. This, however, does not mean that individual herd owners are firmly tied to the territorial groups they belong to in matters of grazing.

⁹⁹ Reuben de Koning, 2003

¹⁰⁰ Dyson-Hudson, 1966

¹⁰¹ Reuben de Koning, 2003

¹⁰² Reuben de Koning, 2003

¹⁰³ Reuben de Koning, 2003

3.5 Environmental Protection

Environmental regulations that are based on traditional custom and sanctioned by community institutions are more likely to be respected than those imposed by external authorities, even where the regulations themselves are very similar¹⁰⁴. For example In some pastoral communities, local lakes are treated as sacred, restricting fishing and waste deposition. Their beliefs that gods dwell in particular natural resources such as lacks, trees and in certain animals is equivalent to seeing intrinsic value in the environment some wetlands are protected for their role in performance of cultural rites such as male circumcision ceremonies.

¹⁰⁴ Lore M Rutten and Monique Borgerhoff Mulder, 1999

4. MANAGING RISK AND ENHANCING RESILIENCE

Pastoralists often reflect a continuing effort at adjustment between the physical and natural forces on the one hand, and the gradual evolution of deep-seated perceptions, customs and cultural forces on the other hand. Traditionally pastoral cultures have managed, through their own empirically developed techniques of farming and herding, to wrest a living from unfriendly and unforgiving soils and at the same time to maintain the productivity and resilience of their rangelands. This is no mean achievement, especially considering that it was done without the aid of the sophisticated, recently developed, technical, and scientific tools for rangeland monitoring¹⁰⁵.

Range resources are typically heterogeneous and dispersed, with their variance tied to seasonal patterns, time and erratic climatic conditions. Those who inhabit these arid regions must contend with a number of variables that regulate range productivity, among which rainfall patterns play a major role. Rains may fall abundantly in one region for decades, yet fail entirely and without warning in any given year. The disequilibrium model of rangeland management and its implications for the importance of mobility of livestock to cope with risk is more suited to the northeast cattle corridor of Uganda, which is in a more arid, uni-modal rainfall zone, than to the southwest cattle corridor in Ankole, which has higher, bimodal rainfall¹⁰⁶.

4.1 Introduction

New Range Ecology tells us that achieving a “steady state” or equilibrium between stocking rate and forage production is not possible on many, if not all, arid and semi-arid rangelands¹⁰⁷. Instead, the interaction of pastoralists and their surrounding conditions has created an institution of reliably maintaining high (i.e., peak) levels of livestock in order to exploit the expected but unpredictable production of low-quality vegetation. In this view, livestock are best thought of as part of the complex technology adapted by pastoralists to utilize and “smooth” a highly volatile, unpredictable and inherently “dangerous” forage resource key to their production system. Livestock are mobile, have a sophisticated digestive capacity to process fibrous vegetation, and are ideally suitable to a diverse landscape where production varies over time and from place to place and where grasses and shrubs are the forage supply. It has long been noted that pastoralists have had and continue to have very detailed knowledge of the range, key resources, cattle and other livestock they manage as part of their production systems¹⁰⁸.

Natural-resource systems can be transformed by human action into less productive or otherwise less desirable states. This has consequences for human livelihoods, vulnerability, security, and conflicts. Such shifts reflect loss of resilience¹⁰⁹. Humans, with their cultural diversity, are an integral component of many ecosystems. Often there is an implicit wrong assumption that responses of ecosystems to human use are linear, predictable and can be controlled and that, the human and natural systems are separate and can be treated independently. Evidence, however, suggests that natural and social systems behave in non-linear ways, exhibit marked thresholds in their dynamics, and that

¹⁰⁵ Ahmad Y, 2003

¹⁰⁶ W. Kisamba-Mugerwa, et al , 2006

¹⁰⁷ The conventional view of rangeland ecosystems, based on Clementsian successional theory and equilibrium plant-herbivore population dynamics, conceptualized the interaction between plants and large herbivores as tightly coupled and mutually responsive such that herbivore populations closely tracked plant biomass, and plant productivity and species composition were highly responsive to increases and decreases in grazing pressure is being dismissed

¹⁰⁸ Emery Roe, Lynn Huntsinger and Keith Labnow, 2005

¹⁰⁹ Carle Folke, et al, 2002

social-ecological systems act as strongly coupled, integrated systems. Most ecosystems are highly variable over time, heterogeneous in space, and resilient; in which long-run primary productivity is influenced more by abiotic factors such as rainfall than by the density of grazing livestock within the system; and the flexibility of opportunistic or 'tracking' strategies of mobile animals, along with many other adaptations herders and farmers make to the vagaries of such dynamic, event-driven ecosystems, allows the exploitation of the varied phenology, production dynamics and forage quality of diverse feed sources¹¹⁰.

It is increasingly apparent to range scientists and managers that plant and herbivore populations in many rangeland ecosystems might not be so closely coupled or at least not in the way described by the conventional models. First, even long-term removal of grazing pressure in many cases does not result in initiation of secondary succession towards a "climax" plant community, calling into question the application of successional theory to range management. It appears that a single ecological site (climate-soil-topographic context) might support a variety of distinct, but stable, plant communities depending on the sequence, intensity, and interactions among various disturbances and stresses (herbivory, fire, drought, etc.) In arid and semi-arid grazing ecosystems systems, livestock-grazing pressure is increasingly thought to be a minor, negligible determinant of long-term vegetation state and associated biodiversity compared with other biophysical factors, particularly rainfall¹¹¹.

4.2 Strategies for Risk Management and Resilience

Focusing on the dynamic capacity of ecosystems to uphold the supply of goods and services here referred to as resilience, through active management in order to secure prosperous social and economic development¹¹². The concept of resilience shifts policies from those that aspire to control change in systems assumed to be stable, to managing the capacity of social-ecological systems to cope with, adapt to, and shape change. Managing for resilience enhances the likelihood of sustaining development in changing environments where the future is unpredictable and surprise is likely¹¹³. Adaptive capacity in ecological systems is related to genetic diversity, biological diversity, and the heterogeneity of landscape mosaics. Adaptive capacity is the ability of a social-ecological system to cope with novel situations without losing options for the future, and resilience is key to enhancing adaptive capacity.

Because a pastoralist lives according to how well they can assess risk and uncertainty, they are more sensitive - and more sensitized - to natural changes than most other population groups. Studies of indigenous knowledge affirm that it is not simply a product of ancient hunter-gatherer societies, but is applied to many aspects of contemporary resource management¹¹⁴.

Pastoralist's intimate and detailed knowledge of his territory must be continually rehearsed and revised. This knowledge is the foundation of the technology of successful nomadism, and represents a huge and continuous investment in time and energy¹¹⁵. Typical examples include herbal medicine, building construction techniques, communal land use arrangements, craft technologies, and knowledge of fauna and flora ecology. Knowledge may be transferred through elders, rituals, initiation, and story telling.

¹¹⁰ Robin Mearns, 1996

¹¹¹ Lore M Rutten and Monique Borgerhoff Mulder, 1999

¹¹² Carle Folke, et al, 2002

¹¹³ Levin et al. 1998, Holling 2001 in Carle Folke et al, 2002

¹¹⁴ Benjamin J. Richardson, 2005

One of the basic principles of range management is range condition class, interpreted as how “healthy” a particular range site is. This involves an assessment of the composition of vegetation at any given site and the degree of differentiation from an ideal climax plant community¹¹⁵. The overall extent of a habitat area is also related to the stability of an ecosystem. Empirical results¹¹⁶ have found that pastoralist-dominated ecosystems more efficient than wildlife ones, and both more efficient than commercial ones because by knowing the range condition class, the proper use factor, or the amount of forage to leave to allow plant nutrients to be restored, and taking into account distance to water, slope steepness, and other factors.

Tracking the rangeland environment in a predictive manner (early warning) is the first key step towards effective mitigation and intervention. However, it was noted¹¹⁷ that while pastoralists in eastern Africa demonstrated an ability to describe their environment and indeed to recognize drought, they were unable to utilize that information in a predictive manner. Scientists have been equally inept at tracking the rangeland environment in a predictive manner. Early warning systems (EWS) instituted by national governments have focused on crop production and thus utilize indicators which are geared towards crop production, and therefore to generally less drought prone areas. Various indicators, which pastoralists use to track their environment, include faecal quality. From these indicators, pastoralists are able to understand current environmental phenomena; however, interpretation is subjective and there is apparently very little ability to translate the knowledge gained into an early warning signal¹¹⁸.

Pastoralists have an intense practical experience and rich knowledge of their environment and the ecological relations between various areas, which is accrued by moving around over large areas and passed on over many generations. They have a vast knowledge of plants and their food and medicinal purposes (human and animal), as well as of animal behavior. This is borne from the necessity to be able to move their cattle safely through various areas and make use of the resources available in these areas, as they cannot be brought along whilst moving. This knowledge is safeguarded and passed on through many cultural institutions and expressions.

4.2.1 Indigenous Ecological Knowledge

Ecological knowledge has always been essential to the thriving of pastoral people and their knowledge of large herd management. Traditional ecological knowledge is described as the knowledge and insights acquired through extensive observation of an area or species. Traditional ecological knowledge represents experience acquired over thousands of years of direct human contact with the environment¹¹⁹. It can be used to understand and predict environmental events upon which the livelihood or even survival depends. Traditional ecological knowledge has been acknowledged as a contributor to understanding the effects of management decisions and human-use impacts on long-term ecological composition, structure, and function.

The critical role of the ecological knowledge of the resource users themselves in such systems, whether traditional or contemporary, generated through experience facilitates

¹¹⁵ Roger Blench and Florian Sommer, 1999

¹¹⁶ Carle Folke, et al, 2002

¹¹⁷ By Dyson-Hudson, 1991

¹¹⁸ Identified by Niamir-Fuller, 1998

¹¹⁹ J. T. Inglis, 2005

the monitoring and interpretation of resource and ecosystems dynamics. The importance of this knowledge surfaces as part of institutional memory, on how to respond to environmental crisis, disturbance, and other changes, this may be the reason that some common property systems survive and others do not¹²⁰. Indigenous ecological knowledge differs from modern, scientific knowledge in that it is intuitive and holistic (as opposed to analytical and reductionism), spiritual (as opposed to mechanistic) and is based on empirical experience through trial-and-error (rather than systematic experimentation by experts)¹²¹. Over hundreds of years, pastoralists have acquired intricate ecological knowledge and understanding of the pastoral ecosystems in which they live and upon which their livestock production economies depend¹²²:

“The pastoralist is not satisfied with generalities: he has a well-developed question and elicitation technique that seeks specific and essential items of information, at the same time he is continually on the alert for other resources to exploit. Every morning the herd owner decides upon a new route for the daily livestock migration. Systematic, consistent individual and group rewards for discovering error, performing acute analysis, and proposing potential solutions”

Pastoralists possess in-depth ethno botanical and ethno zoology knowledge of local environments. A wide diversity of livestock and grazing management techniques are employed by the herders to maintain the natural balance of the land. It comes as no surprise that knowledge of resource and ecosystem dynamics and associated management practices exists among people of communities that, on a daily basis and over long periods, interact for their benefit and livelihood with ecosystems. Also documented is the considerable ethno veterinary medicine that involves the folk beliefs, knowledge, skills, and methods used by farmers for the health care of their animals.

4.2.2 *Bio-Diversity Conservation*

Rangelands are more perplexing environments than most when it comes to conserving or recreating their biodiversity¹²³. The role of biodiversity in ecosystem resilience needs to be explicitly accounted for in management and policy. Hence, in addition to the conservation of biological diversity for aesthetic, ethical, or psychological reasons, there is a more pragmatic reason for conservation. Erosion of functional diversity and response diversity may lead to vulnerability, alterations in nature’s capacity to supply society with essential ecosystem services and support, and degraded social-ecological regimes¹²⁴.

Indigenous knowledge and biodiversity are complementary phenomena, studies that depicted local communities and their knowledge as primitive, simple and static are now countered by a rapidly expanding database generated by both biological and social scientists that describes the complexity and sophistication of many indigenous natural resource management systems. Indigenous knowledge is essential for biodiversity conservation (for example, to protect particular biological communities (e.g. vulnerable wetlands), to protect all individuals of certain species (e.g. particular fodder tree species), to protect organisms at vulnerable stages of their lifecycle, and to carry out periodic harvesting (as a group activity to monitor populations and harvesting levels effectively)¹²⁵:

¹²⁰ Lore M Rutten and Monique Borgerhoff Mulder, 1999

¹²¹ Birgit Müller, 2005

¹²² Emery Roe, Lynn Huntsinger and Keith Labnow, 2005

¹²³ Roger Blench and Florian Sommer, 1999

¹²⁴ Emery Roe, Lynn Huntsinger and Keith Labnow, 2005

¹²⁵ Robin Mearns, 1996

“Serious investigation of indigenous ethno biological and ethno ecological knowledge is rare, but recent studies...show that indigenous knowledge of ecological zones, natural resources, agriculture, aquaculture, forest, and game management, to be far more sophisticated than previously assumed”

Pastoralism has contributed substantially to the diversity of species and habitats, dependent upon stabilizing agro-ecosystems, maintaining ecological balances, developing biological processes to their optimum, and linking agricultural activities with the conservation of biodiversity. Wild species perform a variety of ecological services. Enhancing functional biodiversity is a key ecological strategy to bring sustainability to production.

By respecting the natural capacity of plants, animals and the landscape, pastoralism aims to optimize quality in all aspects of the environment. Biodiversity is generally assessed at three distinct levels¹²⁶:

- Genetic diversity: the variation between individuals and between populations within a species;
- Species diversity: the different types of plants, animals and other life forms within a region or community;
- Ecosystem diversity: the variety of habitats found within an area (grassland, marsh, and woodland for instance).

In general, the degree of biodiversity in agro-ecosystems depends on four main characteristics of agro-ecosystems¹²⁷:

- The diversity of vegetation within and around the agro-ecosystem,
- The permanence of various crops within the agro-ecosystem,
- The intensity of management/farming,
- The extent of isolation of the agro-ecosystem from natural vegetation

For instance, changes in the mix of species modify the ecosystem over the long term a shift in the vegetation composition from palatable grasses to unpalatable grasses and woody plants reduces the availability of fodder for livestock. Woody vegetation can sometimes become so thick as to prevent livestock access completely, but in more open landscapes, it tends to attract pastoralists specialized in browse species¹²⁸. Indigenous seeds have been shown to perform better in the harsh drought conditions. Floral diversity has been shown to contribute to ecosystem stability, while the invertebrate community associated with field boundaries performs many ecosystem functions including biological control of pests and diseases, pollination and food resource for higher trophic levels.

Evidence¹²⁹ from experiments affirms that the diversity of functionally different kinds of species affects the rates of recovery and increase the reliability of ecosystem processes. Documented evidence suggests that a change in rainfall or other climatic conditions often bring about a rapid response in the dry rangelands. Vegetation cover is often found to switch over considerable distances with even a modicum of precipitation¹³⁰. Furthermore, a number of observations suggest that biodiversity at larger spatial scales,

¹²⁶ Carle Folke, et al, 2002

¹²⁷ Carle Folke, et al, 2002

¹²⁸ Roger Blench and Florian Sommer, 1999

¹²⁹ Synthesized by Lawton (2000) and Loreau et al. (2001)

¹³⁰ Ahmad Y, 2003

i.e. landscapes and regions, ensures that appropriate key species for ecosystem functioning are recruited to local systems after disturbance or when environmental conditions change. In this sense, biological diversity provides insurance, flexibility, and risk spreading across scales¹³¹.

Genetic diversity also provides a natural barrier against the evolution and spread of pathogens that can result in large-scale forage or food deficits. As a rule, the more genetically uniform a population is, the more vulnerable it is to pathogens. Plants and animals constantly adapt to counter such assaults. The more diverse a population is, the greater the chance of developing strategies against these pathogens¹³². Today, the diversity of the typical wild flora on arable fields, which is the main habitat for a wide range of species, is at risk.

Many species are endangered due to agricultural intensification, including the intensive use of mineral fertilizers and of herbicides, intensive soil management, and the destruction of habitats. In grassland species, diversity is also decreasing due to intensification of grazing management and to high inputs of fertilizers. Habitat conversion can lead to loss of livelihood for one producer (a pastoralist) and corresponding gain for the arable farmer, a procedure paradoxically reversed when rainforest is converted to pasture.

The Ankole Long Horn cattle breed is unique and represents important biodiversity which should be conserved. Concerns are being expressed among the *Bahima* that confining Ankole cows to small, enclosed, heavily modified spaces outside the park will destroy, or alter, the essence of the cow. This is important to the *Bahima* as the Ankole cow forms the central focus of their cultural and spiritual, as well as economic, existence.

4.2.3 *Ethno Veterinary Knowledge*

Ethno veterinary Knowledge is the indigenous veterinary knowledge or traditional techniques, practices and medicines for livestock that has been passed down verbally. Most practices are plant based and reportedly can be used on “every livestock disease known”. Local medicines are important for the Karamojong, because, they treat a range of various livestock diseases and other abnormalities, including some that have no “modern” medicine treatment, they are cheap, and available to every pastoralist (verses orthodox [modern] medicines). They grow naturally, they are safe, overdoses, and toxicity's are practically unheard of. The transhumant *Karamojong* pastoralists rely heavily on their livestock for their livelihood, and primarily use their ethno veterinary knowledge (EVK) to prevent and treat animal diseases they have developed many local techniques and medicines to insure their health¹³³

Livestock owners can also control the genetic composition of the herd through selective breeding to achieve certain goals, including increasing efficiency of milk and meat production under highly seasonal or drought conditions, or the ability to subsist on poor quality fodder and little water. Other traits that can be maximized include color, domesticity, mothering instincts, herd ability, disease resistance, or ability to walk long distances. Traditional livestock breeds, animal husbandry, and the management of natural

¹³¹ Emery Roe, Lynn Huntsinger and Keith Labnow, 2005

¹³² Roger Blench and Florian Sommer, 1999

¹³³ Jean T. Grade and Longok Anthony, 2000

resources based on detailed ecological knowledge are all part of a set of survival strategies for subsistence pastoralists¹³⁴.

4.2.4 *Abiotic Knowledge*

Soil is one of the chief natural resources. Since pastoralists cannot compensate for a loss in soil fertility by inputs of synthetic nutrients, the building and maintenance of soil fertility is a central objective of pastoralism. Generally, soil management techniques such as organic fertilization and cover cropping improve soil structure and therefore increase the soil's water infiltration and retention capacity, substantially reducing the risk of erosion. These management techniques are also of special relevance on porous ferralitic soils of the tropics and subtropics, available in Uganda's rangelands, which are highly susceptible to soil erosion. The environmental importance of organic matter content is its capacity to limit physical damage and to improve nutrient availability as well as biological activity. Pastoralists depend more on a high and sustained supply of organic substances including animal rotations and animal manure¹³⁵.

Soil is a habitat for plants, animals, and microorganisms. As plants build up organic matter, soil animals feed on them and their debris, whilst microbes decompose the complex organic compounds to their mineral components and to carbon dioxide. Mineralization and decomposition processes are influenced by humidity, temperature, and oxygen. Under humid tropical conditions, these processes run faster and all year round. Sandy soils dry out quickly, slowing down the decomposition process, ferralitic soils on the other hand are generally not very fertile, but they encourage fast decomposition and the building-up of stable organic matter. A living soil is central to soil fertility because it is the activity of soil organisms that makes available the elements in plant residues and organic debris entering the soil. Part of this material, however, remains in the soil and contributes to its stabilization by humus build-up.

4.2.4 *Landscape Management*

Resilience of rangelands depends on the ability of the landscape to maintain water infiltration, water storage capacity, nutrient cycles, and vegetation structures¹³⁶. Within, this the resilience strategy is determined by presence of drought resistant grazing material and landform that enhances water retention. In arid lands, uncertainty is high, and the risks of production and survival are higher. The risk burden is too much for an individual to bear; therefore, common-property regimes are devised to share the risk and spread the burden.

In Kiboga, one of the districts in the cattle corridor, herders categorize landscapes into *Ekiibita* (hilltops), *Omugongo* (slopes of hills), and *Omukura* (the valleys). These classifications are based on physical and vegetation characteristics based on which suitability for grazing is assessed given the soil, landform, vegetation and physical features exhibited by the livestock. Range condition varies among the various landscapes. The herders grazed their livestock in different landscapes depending on the weather conditions. Species richness of grasses did not vary at landscape scales while herb, shrub and tree varied at macro-landscape level. Species diversity of herbs and trees did not vary at landscape scales, while shrubs varied at macro-landscape level¹³⁷.

¹³⁴ Vandana Shiva, 1992

¹³⁵ Roger Blench and Florian Sommer, 1999

¹³⁶ Emery Roe, Lynn Huntsinger and Keith Labnow, 2005

¹³⁷ Patrick Byakagaba, 2005

The understanding and response to ecological pressures by the *Karamojong* has been adversely affected. The drawing of boundaries and restriction of cattle movements has affected transhumance patterns already mastered by the pastoralists through long experience of ecological hardship. To the *Karamojong*, a boundary is determined by the existing natural conditions in a given year. Secondly, some balance with the natural factors is created by people developing patterns of movement and following areas that maximize the use of grass and water. Land management by herders allowed for access to water and grazing for both livestock and wildlife. Productivity of the vast areas of semi-arid land depended upon access of wildlife and livestock to these small perennial sources of water.

4.3 Strategies for Supporting Conservation

Successful management and conservation rest on the capacity to understand and adapt to environmental feedback over time as well as space. Ecological knowledge generated through experience facilitates the monitoring and interpretation of resource and ecosystems dynamics. It is an important component of institutional memory of how to respond to environmental crisis, disturbance, and other change. It is proposed that local-level institutions build resilience for conservation of resources and ecosystem services of local ecosystems have a close fit to the dynamics of these systems¹³⁸, this may be part of the reason that some common property systems survive and others do not. Since “epiphenomenal” conservation may have a close cultural fit that draws on culturally accepted norms and values, its redesign toward intended conservation may involve low transition costs of benefit in conservation¹³⁹.

Mobility and flexibility are essential for the survival of such livestock-keeping people, who continue to provide a major part of the meat and milk produced in the country. Finding ways to maintain and strengthen such mobility is crucial for the survival of pastoral communities, and calls for the pastoral herders to “modernize” and settle down would mean death to pastoral livelihood systems which have proved productive and sustainable, despite harsh and risk prone environments¹⁴⁰.

¹³⁸ Carle Folke, et al, 2002

¹³⁹ Jennifer M. Olson, et al , 2004

¹⁴⁰ Emery Roe, Lynn Huntsinger and Keith Labnow, 2005

5. LAND USE

Land use in pastoral societies was traditionally governed by a set of rules and institutions that provided access to vital resources, such as water, trees, and salt licks, which was regulated to avoid degradation through over use. Changes in land tenure arrangements have been perhaps the most “shocking” driving force of land use change. User rights based on residence and membership within a community have been replaced by legal formalization of group or individual ownership of the communal pastoral land throughout the entire cattle corridor. The use of land by pastoralists as a common property resource has increasingly come under pressure¹⁴¹. Contemporary land uses reflect the influence of both colonial policy and laws, some extending back to the late 19th century, and recent ones, such as structural adjustment policies that date to the 1980s. Since the colonial days, the law has been used extensively as a tool in land management among pastoral areas, it has thus become imperative that access to natural resources for pastoralists is mediated by the imperatives of the natural systems on the one hand and the imperatives of governance on the other¹⁴².

5.1 Introduction

Traditional pastoral land tenure has not been given adequate attention in Uganda. The focus on land tenure policies has been centered on farmland that is clearly demarcated and where improvements are easily discernible. The movement of pastoralists and their herds in search of water and pasture over a common range is thought to be unproductive¹⁴³. An examination of the laws that have governed the administration of land in Uganda reveals how communal land tenure has been gradually transformed by development policies for the privatization and the intrusion of the market economy.

It is difficult to identify a single land tenure pattern for Uganda. Customary land tenure in the pre-colonial period varied from one ethnic group to another. What was common, however, was that access to land came through inheritance, and settlement on any unclaimed land through approval of the head of the ethnic group in the area and other members. Even after colonial enactments such as 1900 Uganda Agreement through which land was allocated to the king, chiefs, and the notables in Buganda, and after subsequent similar agreements in Toro (1900) and Ankole (1901), no uniform land tenure system was established throughout Uganda.¹⁴⁴

In Uganda, the post-independence laws including the Land Reform Decree of 1975, legally transferred all land to the state, and most of the land was accessed for export production and commercial agriculture¹⁴⁵. Other legislation with significant impact on land use in Uganda included the 1995 constitution and the 1998 Land Act, which are likely to stimulate further changes in land use in the future.¹⁴⁶ The debate on land issues, for simplicity, is categorized into two schools, the “individual” and the “customary”. The former urges that lack of socio-economic transformation is due to the persistence of the so-called “customary” tenure and the solution being “individual”, sometimes-equated to capitalist, tenure.

¹⁴¹ Jennifer M. Olson, et al, 2004

¹⁴² Rugadya et al, 2005

¹⁴³ Charles R Lane (Ed) 1998

¹⁴⁴ W. Kisamba-Mugerwa, 1992

¹⁴⁵ Jennifer M. Olson, et al, 2004

¹⁴⁶ Tukahirwa, 2002

The most radical reform was the 1975 Land Reform Decree, whose primary aim was to uproot for the last time, the foundations of customary tenure and pave way for “individualization” of tenure. Essentially, it did away with the power of the customary tenants to stand in the way of developments by refusing grants of lease to persons who are most able to develop the land. Where a particular piece of land was to be developed in a particular way, the tenants occupying that piece of land would be asked to move away to enable the planned development to take place¹⁴⁷.

Today the land question has several aspects to it, there is the question of justification of the current land usage. It raises the issues of transhumance, the border relations with neighbors, and then ownership of land. Overall, land tenure and natural resource policies in Uganda have been following the individual owner model, this is because of the state’s view that rangelands no economic benefit and that pastoralism is unproductive. Land management has evolved from primarily communal management by clans or by the government, to private individual management. The system changes have been accompanied by shifts in how pastoralism is perceived and conducted¹⁴⁸.

Pastoralists almost universally move their herds around in response to the vagaries of climate and a variety of other constraints to make the best use of grazing and water resources. To facilitate this form of foraging, they operate systems of common land tenure. In policy, the criticism against “customary” tenure is essentially the following: first, that there is insecurity of tenure because when land is collectively owned, it cannot be used for co-lateral purposes, therefore, it is impossible to acquire loans from the bank. Secondly, because land is collectively owned there is a tendency to misuse land resources through irrational husbandry techniques¹⁴⁹ such as shifting cultivation or grazing which are inefficient and uneconomic ways of land use. Finally, the inheritance customs lead to fragmentation and, therefore, the rise of uneconomic pieces of land¹⁵⁰.

On the other hand, “individual” tenure is strongly advocated for because it is believed that it offers security of tenure and, therefore, incentive to invest in better agricultural and husbandry techniques. Second, it allows mobility of land resources from the inefficient farmers to the efficient ones through a land market. Thirdly, it offers opportunity to the owner to acquire loans from banks as individualized land serves as collateral security. Interestingly, the virtues of “individual” tenure have not been tested against empirical evidence.¹⁵¹

5.2 Compatibility with Other Land Uses

New land uses have been developed and existing ones transformed. In the more marginal, semi-arid zones, herding systems have experienced multiple chronic pressures to alter land use, the most significant land use changes have been:

- an expansion of cropping into grazing areas, particularly in the semi-arid to sub-humid areas,
- a reduction in size of many woodlands and forests on land that is not protected,
- the maintenance of natural vegetation in most protected area¹⁵²

¹⁴⁷ Nyangabyaki Bazaara, 1993

¹⁴⁸ Jennifer M. Olson, et al , 2004

¹⁴⁹ Just as Hardin’s Tragedy of the Commons

¹⁵⁰ Nyangabyaki Bazaara, 1993

¹⁵¹ For instance, the attempt by Nsibambi to examine the relationships between the landlords and the tenants in Buganda after the 1975 Land Reform Decree was marred by methodological and theoretical failings. His respondents were only tenants and no landlords were interviewed

¹⁵² Jennifer M. Olson, et al , 2004

The conversions of land use is associated with changes in land tenure status, as governments have sub-divided communally managed land for individual ownership, as governments have allocated land for private development, or as new groups have obtained land. Since the colonial period, herding systems have experienced chronic pressure to alter their land use pattern because of multiple forces. These pressures have resulted in reduced access by herders to vital grazing and water resources, competition over resources between herders and wildlife, sedentarisation of pastoralists, and increases in the intensity of resource use in areas where water and grazing remain accessible.

To maximize the use of land there are several strategies that the pastoralists have developed over the years. These include, among others, keeping more than one sort of livestock, dividing livestock holdings into spatially separate units to minimize the effects of localized droughts, and establishment and maintenance of a special system of resource sharing, lending, and giving of gifts to relatives and kinsmen within and outside the clan¹⁵³.

5.2.1 *Wildlife and Forestry*

The gazettement of several forest and wildlife areas in the 1940s and 1950s by the colonial government largely reduced the area of movement for human beings and their livestock given that they were now made mostly inaccessible¹⁵⁴.Gazettement in areas that had been used for centuries for grazing, watering points and agriculture; private and governmental agricultural estates and plantations were carved out of former small scale agricultural areas; and settlement schemes, sometimes forcefully. The result was large “chunks” of land were rapid converted to new uses under new land management structures. Pastoralists became losers in the process.

Currently, protected wildlife areas occupy about 20% of the area of Uganda¹⁵⁵. This is quite significant. Substantial numbers of livestock owned by pastoralists compete with wildlife populations for both water and forage. There is evidence of heavy use of the protected area by livestock in national parks like Queen Elizabeth, Kidepo Valley and Murchison Falls, is also significant.¹⁵⁶ The wildlife areas under the Uganda Wildlife Authority, the forest reserves under the Forest Department and the controlled hunting areas under the Uganda Land Commission are examples of such authority.

The establishment of reserves had a major impact on pastoral land use, since all human activities with the exception of those connected with the management or utilization of wildlife resources, were strictly prohibited thus, fuelling resource use conflict. Due to the difficulties being experienced with dependency on livestock in Uganda, especially among the *Karamojong*, cultivation is becoming widespread. During the short rainy season plots of sorghum can be seen near their homesteads. These are prepared and look after by women. The viability of both the extensive and the more sedentary livestock systems is affected by restrictions on movement of animals to pasture and water due to an increase in fencing of fields.

Socio-economic situation in areas adjacent to parks and reserves thus have implications for wildlife conservation management. More widespread is a chronic problem of

¹⁵³ Tidiane Ngaido and Nancy McCarthy, 2004

¹⁵⁴ ECAPAPA, 2005

¹⁵⁵ Uganda has ten national parks, ten wildlife reserves, seven wildlife sanctuaries and 13 community wildlife areas

¹⁵⁶ Kisamba Mugerwa, 1998

increasing human-wildlife conflict resulting from wildlife predation on cattle, shoats and other livestock, and damage to crops. This is associated with the extension of farming into areas formerly part of the wildlife resource base. As with herders, wildlife has experience reduced access to some grazing and water resources. These have been resolved by wildlife moving elsewhere, while in others, they persist and conflict with people ensues. The marginal lands that were previously the province of pastoralists are increasingly coming into focus as reserves of biodiversity.

The Ankole Region of southwestern Uganda is the home of the traditionally nomadic *Bahima* people. Historically, in dry years, the *Bahima* would follow the wildlife, driving their famous long-horned Ankole cattle south from the rapidly desiccating hinterland¹⁵⁷. When the rains fell, the movements were reversed, and wildlife and cattle dispersed to the fresh grazing and replenished water sources to the north, allowing the vegetation to recover. Because of this pattern, during the dry season there is local political pressure to admit livestock into the park. During the rainy season large numbers of impala, zebra, eland and topi are outside the park, where they are vulnerable to illegal hunting, compete for grazing with wildlife, consume salt purchased for cattle, break fences and damage watering facilities.

The relationships between wild and domestic ungulates co-existing in the same habitats are complex, and turn on the questions of the extent of dietary overlap and competition for forage, and of disease vectors. The potential for complementarity and even symbiosis between wild and domestic ungulates, especially in relation to foraging patterns exists. Domestic as well as wild ungulates are an integral component of drylands ecosystems the world over¹⁵⁸. The presumption that livestock are necessarily inimical to the conservation of wildlife biodiversity has led to policies favoring wildlife over pastoralists. Displaced pastoralists have had to settle with their herds as “squatters” on ranches and in national parks, forest reserves and other private land. The result has been growing conflict between displaced pastoralists and commercial ranchers.

The state-of-science in biodiversity conservation is now shifting from protection for “charismatic” species to defensively managing larger tracts of land with habitats or ecosystems holding suites of sensitive species¹⁵⁹. The human-wildlife issue remains vital, many now argue that either conservation of wildlife will depend upon aggressive restrictions on human land use, or that people living adjacent to wildlife population must be provided sufficient financial incentives for them to accept and protect wildlife. While the grazing of national parks and reserves has afforded protection of wildlife for decades, in many areas dispersal into adjacent areas is necessary to sustain wildlife populations.

5.2.2 *Settlements*

Settlement of pastoralists, whether forced or spontaneous, has resulted in severe land degradation in the semi-arid zones. Decreased mobility of animals’ means increased continuous grazing around the settlements, resulting in reduced vegetation diversity and soil degradation. At the same time, as mentioned earlier, lower grazing pressure in distant pastures results in an invasion of unpalatable plants. Settlement also results in a loss of traditional knowledge about and controls on range use, leading to less-efficient management of the arid resources¹⁶⁰. The pattern of anthropogenic land degradation is

¹⁵⁷ Helen Nakimbugwe and Charles Mchunguzi, 2003

¹⁵⁸ Robin Mearns, 1996

¹⁵⁹ Robin Mearns, 1996

¹⁶⁰ Maryam Niamer-Fuller, 1998

much more severe around permanent settlement sites than it is in open rangelands because of concentration of pressure¹⁶¹.

The increase in population is placing pressure on the land with intensive degradation occurring especially at watering points, along livestock paths and on hilltops. In many pastoralist areas, the spread of privately owned, fenced land has made it increasingly difficult to move between wet and dry season pastures. Many former wet-season pastures have been gazetted as protected areas where grazing livestock is prohibited and severely punished¹⁶². With steady increase in population, the squeezing of pastoralists onto a reduced land area has pushed them to either graze on the crop fields hence conflicts with agriculturalists or looking for pasture elsewhere hence conflicts with their neighbors. Ways should be found to reduce risks of conflict between herders, neighboring crop farmers, and other land users. This could involve locally agreed rules for rights of passage for animals along agreed pathways, access to water and compensation for crop damage¹⁶³.

The tendency to ignore the implications of power differentials on the ability of pastoralists to conserve their environment has pitted them against their more powerful settled neighbors who are cultivators. This power differential influences the extent to which pastoralists can afford the luxury of acting as conservationists. First, pastoralists do not hold secure autonomous rights to their land, what then can the motivation for practicing short-term restraint for long-term benefit is?, clearly this is a case of no long terms incentives for conservation, hence the problem of the commons degenerating into open access. Secondly, pastoralist have been pushed to the margins of the marginal lands, with the settlers taking over all the more productive lands, in such a situation over exploitation is inevitable, as pastoralist do their best to survive on the margins.

5.2.3 *Ranching*

Rangeland management policies in Uganda have promoted development of private ranches, causing displacement of pastoralists from extensive rangeland areas. During the 1960's about 400 large ranches were developed on extensive pastoral lands cleared of tsetse fly infestation and were leased to influential politicians and cooperative societies, managed by the political elite without due regard to the typical grassroots pastoralists of the area¹⁶⁴. Since colonial times a number of changes have taken place in the management of rangeland resources in Uganda. The process took the form of settlement of some pastoralists who hold the land under communal land tenure system, the creation of privately owned ranches such as the Ankole-Masaka Ranching Scheme, in which the land is held under titled leasehold land tenure, and the creation of various national parks and game reserves located within the cattle corridor¹⁶⁵. The impact of these development policies varies according to the aridity of the rangeland. These changes reduced the rangeland area available to traditional pastoralists, and became a source of conflict, both within the cattle corridor and with neighbouring districts

5.2.4 *Cultivation*

From the colonial period up to the present, land tenure policies have been directed towards promoting private ownership of the land. Uganda is pursuing a 'blanket cover' policy towards resettling pastoralists throughout the country, without considering the

¹⁶¹ Maryam Niamer-Fuller, 1998

¹⁶² Lore M Rutten and Monique Borgerhoff Mulder, 1999

¹⁶³ Emery Roe, Lynn Huntsinger and Keith Labnow, 2005

¹⁶⁴ W. Kisamba-Mugerwa et al, 2006

¹⁶⁵ W. Kisamba Mugerwa, et al, 2006

heterogeneity of the pastoral economy¹⁶⁶. The main rangelands within the cattle corridor areas are experiencing increasing individualization of communal grazing land. Due to the difficulties being experienced with dependency on livestock in Uganda, especially among the *Karamojong*, cultivation is becoming widespread. During the short rainy season plots of sorghum can be seen near their homesteads. These are prepared and look after by women. The viability of both the extensive and the more sedentary livestock systems is affected by restrictions on movement of animals to pasture and water due to an increase in fencing of fields. This practice is widespread in the districts of Mbarara and Ntungamo.

In the rangelands of Kasese district, it is causing tremendous tension between the *Basongora* (cattle keepers) and the Bakonzo (cultivators), rendering the *Basongora* almost landless¹⁶⁷. Karamoja is also beginning to experience a trend towards individualisation of grazing land rights. This is leading to a high incidence of rangeland resource use conflicts, displacement of indigenous pastoralists, and crises in rangeland management.

5.2.5 *Minning*

Although mineral extraction is a subject to controversy, the presence of regulatory frameworks and highly-developed advocacy groups ensure public debate and eventually pressure to adopt sustainable and environmentally sound practice. This is very much less the case in the developing world, partly because of the relative economic importance of mineral revenues, with the consequence that governments are generally not keen to publicise details of either potential income or environmental impact¹⁶⁸. Uganda's National Mining policy puts extra pressure on agricultural and pasture lands—with Exclusive Mineral Prospecting licences (EPL's) being issued that cover every inch of the land in Karamoja where there are minerals.

5.3 **Land Use and Conservation:**

The establishment of protected areas and biosphere reserves are currently viewed in the great majority of their locations by local communities as outside imports, cultural impositions, from which they seldom benefit. This is a perception, which imposes an unnecessarily heavy burden on conservation efforts. The challenge is to get all parties to agree on common paths in which capacities are tapped, responsibilities are shared, and everyone is expected to receive some benefits (and bear some costs) for the conservation and sustainable use of biodiversity. In reality, the distributional incidence of costs and benefits of biodiversity conservation and sustainable use is seldom shared in a fair and responsible manner¹⁶⁹. The establishment of protected areas is a primary strategy to conserve biodiversity, although reserves alone cannot guarantee that biodiversity will be maintained. Protected areas are especially dedicated to the protection and maintenance of biological diversity¹⁷⁰.

There is growing recognition that conservation areas as islands surrounded by wildlife deserts are not sustainable, and that management of wildlife outside conservation areas needs to be improved, the conventional approaches to biodiversity conservation place unacceptable burdens on poor local communities¹⁷¹. A major reason for this focus is the recognition that conventional resource management and conservation as practiced by

¹⁶⁶ W. Kisamba-Mugerwa et al, 2006

¹⁶⁷ Government of Uganda, 1993:13

¹⁶⁸ Maryam Niameer-Fuller, 1998

¹⁶⁹ Ahmad Y, 2003

¹⁷⁰ As defined by the World Commission on Protected Areas

¹⁷¹ Charlotte Boyd, et al, 1999

governmental agencies and models of resource exploitation often lack the capacity for responding to environmental change that pastoralists have. It is necessary to make the need for conservation measures understandable and acceptable to the pastoralists and to complement the perception of the link between the number of species and the productivity of ecosystems. Recent research shows that effectiveness of protected areas is limited by the fact that many are too small and isolated to sustain the full range of ecosystem services.

It is argued that wildlife conservation and livestock production are potentially more complementary, but the point remains that the amenity and option values of biodiversity should be fully reflected in the prices paid by those who make use of these benefits, and should be used to compensate those who bear the additional costs of providing them. A dispassionate understanding of where, when, and how humans engage in conservation is central to the development of strategies designed to develop sustainable patterns of resource use, to protect human rights, and to conserve biodiversity¹⁷². Indeed, indigenous groups demonstrating no conservation ethic under traditional conditions readily become conservationists as they adjust to the novel political and economic environment.

Conservation authorities, often short of resources, have generally failed to prevent the decline in wildlife numbers through protectionism, exclusion, and policing. There is no systematic policy under which a comprehensively coordinated program is developed to integrate the pastoralists to be involved in the management of natural resource conservation and development schemes managed by the State. Furthermore, the rangeland tenure of the country has been influenced towards individualization by historic government development policies.

It has been argued that local pastoral inhabitants see very few benefits from wildlife. Conservationists, on the other hand, argue that livestock mismanagement underlies the decline in pastoral livelihoods¹⁷³. Opportunities to address these conflicts and competing land use interests are provided by the dynamic concepts of rangeland ecology and the philosophy of incorporating benefits to local people, based on the recognition that pastoralist-stocking strategies are less damaging to rangeland resources than previously thought, and that rangeland conservation would be better served by allowing traditional patterns of pastoral movements than by promoting lifestyles that are more sedentary¹⁷⁴.

Lastly, for the pastoralists, the concept of optimal plant foraging for survival is more palatable than conservation alternative. In fact, it is not an alternative at all, rather sustained production and continued use, is the driving factor. Indeed, a strategy can be both environmentally friendly and economically rational, particularly where pastoralists have more control over the resources they depend. Henceforth, conservation performance is not a valid reason for divesting indigenous peoples of their land. Indeed, indigenous groups demonstrating no conservation ethic under traditional conditions readily become conservationists as they adjust to the novel political and economic environment. Thus, policies divesting pastoral lands extinguish the human abilities of pastoralist to conserve¹⁷⁵.

¹⁷² Lore M Rutten and Monique Borgerhoff Mulder, 1999

¹⁷³ Charlotte Boyd, et al, 1999

¹⁷⁴ Charlotte Boyd, et al, 1999

¹⁷⁵ Margaret Rugadya, 2006

In summary, livestock production systems found themselves restricted in area, and in quality and quantity of water and pasture resources available. Over the past 50 years, and particularly since independence, the creation of parks and reserves, and the extension of crop agriculture in to the wetter margins of the rangelands have altered the viability of pastoralism. Many pastoralists become poorer, while others who have successfully diversified¹⁷⁶. The patterns of land use have changed with implications for grazing intensity, the structure of vegetation, and the distribution of wildlife. In recent years, the dual sides of the coin—right to use and responsibility to manage—have become separated. The concept of priority of use—that is, the “splitting” of tenurial rights into primary, secondary, or tertiary—can be translated into a legal mechanism to reinstate effective governance. It is applicable not only to transhumance areas, but also to other areas with systems that govern multiple uses of land, such as community forests. In defining the system of priority of use, it is important to be able to define the social boundaries of a community¹⁷⁷.

¹⁷⁶ Margaret Rugadya, 2006

¹⁷⁷ Maryam Niamer-Fuller, 1998

6. ENABLING POLICY FOR PASTORALISM

The range of policies pursued by successive post-colonial governments has had a tendency to neglect the needs of pastoralists and even to envisage the gradual eradication of pastoralism. Most states have pursued policies based on containment, pacification, and sedentarisation of pastoralists. Of particular importance are the land policies since the colonial period that have shaped the land tenure systems with wide implications on the utilization of land¹⁷⁸. Colonial policies and the legal framework led to alienation of land this directly affected the distribution of land between native people. Particularly severe was the impact upon livestock based livelihoods in the semi-arid regions as settlers occupied the best watered of the lands so vital in dry seasons and periods of droughts. Land ownership was used by the colonial state as a tool to elicit political loyalty and collaboration to extend its sphere of influence to areas where physical presence was not possible, mainly in pastoral areas¹⁷⁹.

6.1 Introduction

Colonial policies alienated land with the view of developing agricultural production to meet industrial needs for raw materials in Europe. Such production policies offered little support or space for pastoral production to function. As earlier as 1894, the policy of alienating pastoralist from their land had already commenced, hence the all round declaration targeting customary and communal lands to be crown land. For example, the ranching schemes in Ankole. The attributes of land use vis-à-vis ownership and the need for mobility, whether pastoralism, agriculture and wildlife, should be developed at the same level, or one at the expense of others and the recognition of pastoralism as part of the livestock sub-sector. Nevertheless, policy makers in both the colonial and independence periods adopted policies that assumed that mismanagement of rangeland resources was the norm among pastoral communities.

Throughout history, the pastoral development question has not been dealt with. The negative stereotyping of pastoralists as “nomads” was reflected in the appointment of a “Minister of State in charge of Ranch restructuring, Water development and Anti-nomadism” in the National Resistance Movement cabinet reshuffle of 18th November, 1994. Such preconceptions tend to the adoption of inappropriate policies and development approaches that fail to deliver adequate social services and technical support to pastoralists relative to other groups¹⁸⁰. During the period of ranch demarcation pastoralists were unaware of the opportunities to register titles to land, or of the adverse effects of establishing ranches on their land. Even the selection criteria for ranch allocation were unclear to them. The procedures for application were too elaborate for an illiterate population to follow easily. Advertisements in newspapers, published in English, remained largely inaccessible to them, in terms and conditions of occupancy of the ranches were not made clear by the administration, the outcome of this was that large numbers of pastoral people were rendered landless, while retaining large numbers of livestock.

Another example of action is the Karamoja Development Agency, which was established by the government in 1987 to supervise rapid economic and social development in the area. The agency is to ensure that the *Karamojong* people acquire the necessary skills to enable them to bring about this development. The agency is specifically charged with

¹⁷⁸ Margaret Rugadya, 2005

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¹⁸⁰ Charles Lane,

providing sufficient water for agriculture and livestock husbandry, and with a view to settling them.

However the major challenge for environmental governance is that the local governments who are responsible for implementation of sector plans based on local priorities have not seen value in empowering pastoralist as a priority in the marginalized category, even where the livestock sector contributes more than 50% of the districts budget e.g. Mbarara District¹⁸¹. Privatization is expected to underpin the development of a land market and deliver credit to farmers excluding pastoralist, whose rational behavior in relation to environment is not underscored in this policy. The land market is to expand as pastoral lands shrink.

6.2 Current Policy Framework

Uganda has been pursuing liberalization and privatization, through structural adjustment and transformation policies, indeed the Poverty Eradication Action Plan 2004/07¹⁸² which is Uganda's Poverty Reduction Strategy Paper (PRSP) targets transformation of traditional subsistence systems of production, one of which is the pastoral production to orient them to market-led production, a value that is not properly implemented in pastoral areas¹⁸³. Currently, the concept of development revolves around poverty eradication, that is strongly linked to the utilization of the natural resource base, thus protecting natural resources is essential for growth. The national development strategy commits to tackle the following¹⁸⁴, among others:

- Agriculture (with a commitment to focus on the impact of livestock on livelihoods of the poor, noting that animal disease control and affordable veterinary services are important)
- Energy (by encouraging private sector investment)
- Mining (by encouraging observance of mineral policy and maximization of benefits)
- Environment (commits government to develop a sector wide approach to the Environment and Natural Resource Sector and notes the potential benefits in clarifying land rights)

Whereas the cash crop farmers have benefited from diversified crop base and an increase in cash crop prices, there has been failure to generate comparable export earnings from livestock and livestock products, which has affected the incomes of cattle keepers, majority of whom are pastoralists¹⁸⁵. This failure to directly target pastoralist is glaring, the PEAP only commits to develop a livestock policy and strategy that recognizes the multiple contribution that livestock makes to livelihoods and addressing the needs of pastoralist- these needs are not clarified or stated¹⁸⁶. This policy calls for judicious management of natural resources especially the rangelands in broad terms, and fails to include any particular priority needs or activities that it will address pastoral issues.

For pastoralist, the basic principle of natural resource management is rationalizing opportunistic behavior and mobility. In this sense, the policy becomes mere rhetoric for the inhabitants of the rangelands¹⁸⁷. For example, livestock policies are biased towards

¹⁸¹ Margaret Rugadya, 2005

¹⁸² Developed as a national strategy for reducing poverty and placing poverty at centre of development agenda, aiming to eliminate mass poverty, targeting a reduction of 10% by 2017

¹⁸³ Margaret Rugadya, 2004

¹⁸⁴ PEAP, 2004

¹⁸⁵ Margaret Rugadya, 2004

¹⁸⁶ PEAP, 2004/2008: 55-56

¹⁸⁷ Muhereza, 2003

ranch development for commercial purposes. In addition, conservation strategies have focused on the preservation of wildlife without taking into account the needs of other forms of land use. In the past, pastoral areas have been the focus of water improvement and livestock health facilities. However, broader issues of pastoral land use have generally been ignored. Laws and policies, these law and policy interventions can be of great significance to people's agro-pastoral lives in the near future. Most influential state law and policy continues to derive from central state authorities. These authorities still run into many obstacles, such as continuing violence and distrust of local populations, when trying to set foot on the ground in the pastoral areas¹⁸⁸

These developments have, in most cases, worked to weaken pastoral land rights. In some cases, as in the ranching schemes, developments have physically displaced pastoralists. This is particularly true in Nyabushozi County in Mbarara district. Game Reserves and National Parks have excluded pastoralists. Other development projects, especially those providing water, have disrupted land management by concentrating people and cattle, resulting in the subsequent over-grazing of pasture. This is particularly evident in Karamoja where herds are assembled around water points in the dry season.

Today, the government is pursuing the Plan for Modernization of Agriculture, is grounded in the ideology of transforming agriculture from a largely subsistence to a commercial sector it has the following weaknesses as far as pastoralism is concerned:

1. It is an input driven process, amplifies the importance of credit, adoption of new technologies, developing market infrastructure and implementation of the land law, none of which take serious, the pastoral contribution or specific efforts of ensuring their enhanced role in these areas.
2. The plan does not contain adequate policy guidance and strategies on how government can create or use the market as a stimulant for increased production. Because of the modernization thrust, policy focus has leaped from ensuring food security to transforming subsistence agriculture to commercial agriculture; and now to an export focus. Government abducts its role of assisting farmers to orient from subsistence to commercialized farming passing it over the role to private investors
3. The focus on livestock development and marginalizes pastoralist development, yet pastoralists make substantial contribution to the economy (9%), instead it associates them with environmental damage and overgrazing. Pastoral areas are isolated from national socio-economic aspects and in the planning of development programs, the interface between pastoralism and the broader natural resources sector is not taken into account for a holistic co-existence of pastoralism and "sound environment"
4. focusing on production from agricultural paradigm, where the overriding interface with the natural resource base is modification of the environment rather than management of natural resources. The pastoral production environment does not avail itself to modification and is best addressed through natural resource management principles¹⁸⁹
5. Sustainability is at the heart of pastoral production manifested through survival skills and mitigation of vagaries of the environment. The livestock development approach pursued under PMA provides no rigor for the pastoralist sub-sector because it emphasis individuals participation in production, the concept of; what is in it for me?

¹⁸⁸ Reuben de Koning, 2003

¹⁸⁹ Muhereza, 2003:25

6.3 Actions Needed for Positive Policy

In a recent review of policy, lessons from various studies¹⁹⁰ summarize the evolution of policy. Earlier development policy for pastoral regions held one view in common: that rangelands were suffering from degradation caused by overgrazing of domestic animals, due to animal increase. Though available, technological options to combat this problem were seen as constrained by pastoralists' traditional and social systems, in particular the tendency for communal tenures and livestock mobility. Individualization¹⁹¹ and controlled stocking were the preferred solutions. They failed: degradation was not halted, livestock numbers did not decline, and individualization resulted in loss of rights for vulnerable groups and individuals. It increased stratification and inequalities in pastoral societies.

Individualization has weakened established norms and rules for the regulation of pasture use, and opened up customary land to non-traditional users who were not tied by those customary norms and rules. Within this overall legal umbrella, procedural laws more consistent with the requirement of flexibility should be strengthened. Procedural law would include developing administrative and judicial institutions at the local level to manage common property, recognizing temporary rights of usage, establishing through local dialogue and participation the principles and guidelines for judging claims, and creating the means and procedures for enforcing rules¹⁹².

In general, many pastoral communities lack the political weight required to influence policy decisions related to access to land and water resources – where there are no vibrant and effective pastoral civil society organizations capable of engaging with policy apparatus to represent and defend the interests of pastoral people. Many pastoral civil society groups are unrepresentative and unaccountable; have difficulty in establishing a common front with each other or strong links with other groups; and have limited financial resources and poor management skills¹⁹³.

The privatization path constrains mobility on which traditional pastoralism is based; and if the trend continues unabated, movements may become restricted in the future, perhaps to the extent of full sedentarisation, hardly the basis for a stable production system in this semiarid area. Policies that aim at either increasing tenure security or directly improving resource management need to consider the trade-offs between flexible access and the hoped-for improvements in pasture management. There is little evidence that mobility of these herds is limited particularly drought years. Policies to improve tenure security and resource management should first focus on settled areas.

¹⁹⁰ on pastoralism in eastern Africa and Asia, Fratkin and Mearns (2003)

¹⁹¹ A number of people (e.g. Leach and Mearns 1996) use the term privatization to include private ownership by groups as well as by individuals. This paper uses individualization instead of privatization to avoid ambiguity

¹⁹² Maryam Niameer-Fuller, 1998

¹⁹³ Emery Roe, Lynn Huntsinger and Keith Labnow, 2005

7. CONCLUSIONS

Pastoralist management retains conservation-compatible rangeland and makes the most of livestock production opportunities within those variable and unpredictable rangeland ecosystems without otherwise much affecting conservation outcomes¹⁹⁴. The pastoral strategies of herd diversity, flexibility, mobility are rational and crucial for survival in erratic environments. These strategies are based on the need to respond as rapidly as possible to changing climatic and vegetative conditions, through enhanced mobility and such means of information gathering as may be available. Indigenous pastoral resource management systems are commonly based on distinctive customary rules governing access to resources and rules concerning control of resource use, they are not mere traditions but adaptive responses that have evolved over time, often based on kinship, social classes, or other ties frequently determined rights of access.

It is believed that even cases of “epiphenomenal” conservation can be instructive since unintended conservation mechanisms play an active role in preserving endangered species and that such institutional mechanisms even preserve important habitats. The key to the success and survival of the pastoral nomad lies in the keenness of his observation of variations in vegetation and precipitation in time and over different parts of the rangelands and on his successful (or unsuccessful) exploitation of the observations¹⁹⁵. However, a common thread is the criticism that the enormous environmental knowledge that indigenous populations exhibit cannot in itself guarantee that these societies avoid resource depletion over the long term, though such knowledge is of course of *potentially* immense value for resource managers.

Achieving efficient, equitable, and sustainable rangeland management depends on the costs and benefits of alternative systems. These costs and benefits, in turn, depend on agro ecological, socio-cultural, and economic characteristics. The conservation and management of rangelands require not only tenure security, but also an understanding of local livestock production and risk management strategies and factors that promote collective action, which can then be integrated into national policy formulation strategies and project designs.

¹⁹⁴ Lore M Rutten and Monique Borgerhoff Mulder, 1999

¹⁹⁵ Ahmad Y, 2003

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