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**Pastoral Livelihood Adaptation to Drought and
Institutional Interventions in Kenya**

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1.0 Introduction

Kenya straddles the equator, lying between latitudes 5° north, and 5° south and between longitudes 34° and 42° east. Kenya's climate can be described as varied, ranging from the humid tropical climate around the coast, through the montane climate of the highlands to the arid and semi-arid climate inland and to the northern parts of the country. While mean temperature varies with elevation, the more remarkable climatic variation is with respect to precipitation (Figure 1). Inter-annual and intra-annual rainfall variability is high in Kenya, and in the last half-century, rainfall means have been decreasing inland and increasing on the coast.

Over two thirds of the country, particularly areas around the northern parts of Kenya receive less than 500mm of rainfall per year and are classified as Arid and Semi-Arid Lands (ASALs). These are home to approximately 10 million people, a third of Kenya's population (Figure 2). Agriculture is the main sector of the Kenyan economy and its performance strongly influences overall economic performance. Livestock production (largely through Pastoralism) is a production strategy in which people raise herd animals as a means to earn a livelihood, particularly in ASALs. Livestock production accounts for 26% of total national agricultural production and over 70% of the country's livestock and 75% of wildlife are in the ASALs (GoK, 2005). Pastoralism relies on the availability of water, pastures and labour to thrive - with water as the determining factor.

While there is no acceptable single operational definition of drought, in meteorological terms, annual drought (the failure of two successive rainy seasons) may occur anything between 1 year in 3 and 1 year in 30. Kenya experiences major droughts every decade and minor ones in three to four years with the exception of the arid northern part where it is experienced yearly with varied consequences (UNEP/GoK, 2000). These droughts have resulted in immense losses in resources and affected the livelihoods of many who depend on the ecosystem for survival, particularly the pastoralists. The impacts of these droughts on the population are increasing exponentially (Table 1).

Table 1: Occurrence of droughts in Kenya

Year	Type of Disaster	Area of coverage	No. of People Affected by Droughts
2004-2006	Drought	Widespread	3.5 Million
1999/2000	Drought	Widespread	4.4 million
1995/96	Drought	Widespread	1.4 million
1991/92	Drought	Arid/Semi Arid Zones	1.5 million
1983/84	Drought	Widespread	200,000
1980	Drought	Widespread	40,000
1977	Drought	Widespread	20,000
1975	Drought	Widespread	16,000
1971	Drought	Widespread	

Source: Oxfam International (2006): Making the case: A national drought contingency fund for Kenya, Oxfam Briefing Paper, 89

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The 2000/2001 and 2006 droughts were the worst in at least 60 years, and between these two extreme years, several other rainy seasons have failed. The variability in rainfall has also affected biomass productivity, as biomass productivity correlates with mean annual rainfall in the country. Although studies have shown a general increase in biomass productivity in Kenya between 1983 and 2000, some regions such as South-eastern Garissa of North-Eastern Province have experienced a significant decline in biomass production over the same time period (Bai and Dent, 2006). This has negative implications for fodder availability for pastoral production. Climate change introduces an additional uncertainty into existing vulnerabilities in the ASALs. Climate models project a substantial increase of up to 5° Celsius in the annual average temperature for Kenya by the end of the century (Osbaahr and Viner, 2006) which could lead to decrease in cattle population by 2050 compared to sheep and goats whose population could initially increase by 2030 but reduce by 2050 (Table 2).

Table 2: Changes in Length of Growing Period (LGP) in Kenya from year 2000 to 2050 (HadCM3 scenario A1F1). (Adapted from Thornton et al. 2006).

Population ('000)	Year		
	2000	2030	2050
Human Population	30,529	41,169	44,313
Cattle	13,840	12,988	12,452
Goat	9,600	11,058	10,803
Sheep	8,439	9,415	9,157

While there remain uncertainties regarding the changes in average rainfall, projections clearly indicate that regions in the arid east and north would experience decreases in precipitation, exacerbating their aridity. Indeed much of the country is likely to experience a reduction in the length of growing season (Figure 3 and 4). The consecutive rain failures in the past two decades have prompted speculation that this is an early signal of climate change. It is estimated that drought events, largely due to failed rainy seasons, will increase both in frequency and intensity with projected climate change (Osbaahr and Viner, 2006; GoK, 2002).

While climate variability and change, particularly droughts, strongly affect both pastoralists and crop farmers, the impacts are higher on the pastoralists. First, they constitute the majority in the ASALs where there is a greater probability of drought occurrences. Second, they face many other non-climatic challenges such as low soil fertility, weak infrastructure, and the consequences of inappropriate natural resource management policies. For instance, drought contingency planning is often non-existent, particularly with regards to the provision of veterinary services. The consequence is that in the face of a climatic anomaly such as drought, or a fast-spreading health risk such as the current outbreak of Rift Valley Fever in the region³, pastoralists are often the hardest hit. These factors in combination make the pastoralists very vulnerable to current and projected droughts.

³ From 30 November 2006 to 12 March 2007, a total of 684 cases including 155 deaths (case-fatality ratio, 23%) of RVF was reported in Kenya. Where 333 cases were reported in North Eastern Province, 183 in Rift Valley Province, 141 in the Coast Province, 14 in Central Province, and 13 in the Eastern Province.

The question therefore that needs to be asked is: How can pastoral systems adapt to future drought occurrences in Kenya? Droughts are not new in Kenya and the local populations have over the years developed indigenous ways of adapting to the phenomenon. However, these strategies are no longer adequate with the increased frequency and intensity of the drought events. Governments and donor agencies have also developed and implemented interventions to help reduce the vulnerability of pastoralists to the impacts of droughts. Most of the interventions have tended to be reactive in nature showing limited understanding and lack of appreciation of the pastoral livelihoods. In this case study, we review the vulnerability of pastoral systems to droughts in some districts in Kenya, the indigenous ways in which the pastoralists have coped with the events and some exogenous interventions that have been implemented along with their successes and failures. The case study ends with recommendations for implementing effective adaptation strategies among pastoralists in Kenya.

2.0 Vulnerability of Pastoralist livelihoods to Droughts in the ASALs in Kenya

Vulnerable people in Kenya, including pastoralists, generally have over the years developed a variety of alternatives to decrease their risk in times of droughts. However, new and persistent environmental, political and social pressures often limit choices that have traditionally been available, exacerbating their vulnerability. In discussing these factors, we use examples of Maasai from the semi-arid district of Kajiado in southern Kenya and to a small extent the Turkana from the arid Northwestern part of the country (See Figure 2).

Both the Maasai and Turkana pastoralists are particularly vulnerable to the frequent droughts that characterise the ASALs. The most direct impact of drought on the livelihoods of these pastoralists is the drying up of water sources and declining forage resources for livestock resulting from the increasing aridity. Among the Maasai of Kajiado, this is exacerbated by the fact that many landowners are increasingly selling off their productive lands for other commercial purposes thus pushing the local pastoralists to the drier parts of the district.

Increased population and sedentary lifestyles especially in Kajiado district have made the Maasai more vulnerable to climate variability because grazing lands are settled or remain classified as protected areas. For a long time the Maasai's practised semi-nomadic pastoralism on land that was communally owned. However, changes in land tenure policies have favoured land privatization and fragmentation of former communal holdings leading to increased land sales that have encouraged immigration of agricultural communities especially to the relatively high potential areas of Kajiado District (e.g. Ngong, Loitokitok foot slopes of Namanga hills etc) where they practice crop farming.

Profitability of cropping compared to livestock in wetlands and around watercourses in ASALs, even though not sustainable, together with the fear of losing land rights has fuelled the desire among many Maasai landowners to subdivide. It has been found that the amount of land under irrigation in Kajiado district expanded from 245 to 4768 hectares between 1973 and 2000 (Maitima and Olson, 2006). These changes in land ownership and land use practices and the fact that key utilities such as holding grounds that used to be publicly owned have assumed private ownership have led to reduced

access to streams and wetlands, dry season grazing areas and migration corridors for cattle. This has at times necessitated the trekking of extended distances by pastoralists in search of water and fodder, which contributes to the deterioration in their livestock productive capacity.

The need to have access to watercourses and forage for livestock has resulted in the many conflicts that have been recorded between pastoralists and sedentary farmers and among neighbouring pastoral communities themselves. These conflicts in the ASALs are partly to blame for the increasing vulnerability of pastoralists to drought. Due to insecurity, herds concentrate in small areas thought to be secure while leaving large tracts of land unused as seen in parts of Eastern and North Eastern Provinces of Kenya (Eriksen et al., 2006; UNEP/GoK, 2000). Conflicts are particularly common during drought when competition over grazing and water resources gets stiff and has in certain cases involved cross-border fighting as in the case of Turkana of northwestern Kenya who have long running conflicts with neighboring communities, some coming from across the national boundary. In 2000 for example, Turkana herdsmen explained that pastures had reduced due to drought and insecurity, as they were unable to access some of their dry season grazing areas due to increased cattle raids among them and the neighbouring Pokot community with whom they have conflicts over land (UNEP/GoK, 2000). The fact that these areas are not adequately policed encourages communities feeling insecure to arm themselves for self-protection partly contributing to the proliferation of arms and sometimes creating a conducive environment for criminals intent on making quick money through raiding and selling animals

Pastoralists are mainly faced with two processes during drought that adversely affect their capacity to support themselves and effectively raise the minimum herd numbers required to maintain their households. First, they face a fall in levels of productivity from their herds following losses in their livestock capital from higher mortality rates, low or zero calving rates, reduced production of milk and weight loss in animals that reduces their market value. These factors by themselves often make the pastoral enterprise and household less able to provide for its needs. For instance, results of a study conducted during the droughts of 2000 showed that median household herd size over a nine-month period decreased by 44% in Kenya, with an annualized death rate of 53% (McPeak, 2001).

Second, in addition to reduced levels of productivity within the livestock sector, pastoralists are usually faced with a double trade tragedy during droughts. On one hand, they are forced to sell off their cattle rather than face loosing them to starvation while on the other, they are faced with changes in the terms of trade that adversely affect the purchasing power represented by their herds. During droughts, the demand by farming communities for livestock products is likely to fall, due to reduced productivity in the agricultural sector, coupled with the relatively low income-elastic demand for livestock products such as milk and meat, in contrast to grain. The study by McPeak (2001) also showed that during the drought of 2000, the overall livestock sales rates for households were relatively high by pastoral standards with an annualized sales rate in Kenya of 12%. However, these sales do not necessarily imply higher incomes as they are driven by distress sales. Nevertheless, even with these high sales rates, the observed decrease in herd size was due more to mortality than it was to sales. The frequent resource-induced

conflicts that occur in the region also contribute to the reduction in herd size. Among pastoral households, the impacts of drought on herd size may have frightening implications. Livestock is not simply a source of protein, but also represents their source of income, savings, social status and security. To lose animals through droughts, therefore, may well represent an economic and social disaster at the household level.

3.0 Pastoral Adaptation to Climate Change

As stated earlier, droughts are not new among pastoralists in the ASALs. A large number of actors have been involved in developing and implementing adaptation strategies to reduce the vulnerability of pastoralist groups to the adverse impacts of droughts. These actors include the pastoralists themselves, the government of Kenya who has enacted several policies and instituted measures to reduce the impacts of droughts, multi- and bilateral aid agencies and NGOs.

3.1 The Pastoralist Groups

The pastoral groups have developed fairly effective coping strategies in response to drought events. These coping strategies are aimed at minimizing losses or facilitating recovery after drought. Unfortunately, many of these strategies that have served drought-affected communities well may become inadequate in light of the frequent occurrences of droughts, rapid socio-economic and long-term climatic changes.

The practice of keeping mixed herd of grazers and browsers not only ensures that animals make use of the different resources (grasses, shrubs etc) but is also a risk management strategy since the different groups of animals are unlikely to be affected in the same way during drought. In addition, many households or families keep animals with relatives and friends elsewhere to guard against losses through disease, raids or drought. Animals kept elsewhere always come in handy after a disaster, as pastoral families are able to restock quickly and move on with their lives than rely on outside help which often takes a long time to reach affected areas which most often suffer from geographical marginality.

The communal ownership and management of natural resources are central to pastoralism because they ensure that herd owners can move freely as they search for water and pasture in different locations at different times of the year. The movement of pastoralists to areas of higher productivity has the additional benefit of alleviating stress on less productive land. Conversely, if the movement of pastoralists is restricted, as is the case in Kajiado District due to the on-going land subdivision and titling, already marginalised land becomes more overused. As pastoralists make long journeys in search of fodder and water, the mortality of their animals increases, and they are forced to calculate likely losses from the migration against likely losses if they stay on suboptimal land.

Because of the unpredictable nature of drylands, pastoralists embark on strategies to take advantage of the good years. First, they often stock more productive females in their herds to ensure that animals lost are easily replaced when the climatic conditions improve and grass and water become abundant. Second, they keep a large number of animals and this is one of the important aspects of pastoral productive systems, which is not well understood often leading to calls for de-stocking to carrying capacity. Even though the use of carrying capacity in determining the appropriate stocking levels may be useful, it

often ignores the fact that the way animals are grazed may be more important than the numbers considering the mobile nature of pastoralists.

Another strategy the pastoralists had successfully used to cope with droughts has been to maintain exchange relations with neighbouring agricultural counterparts with whom they exchanged livestock and animal products for grains to supplement their diets when production of milk went down. The Maasai for example traded with neighboring agricultural groups such as the Kikuyu from Central Kenya where they got cereals in exchange of their livestock products such as milk, hides and skins.

The creation and maintenance of grazing corridors reinforces co-operation between the agricultural and pastoral sectors. However, very narrow corridors often tempt hungry animals to graze on the crops on either side; pastoralists have to use more labour to keep their herds under control, and the potential for aggravating the conflict between cultivators and pastoralists is apparent. Of late this has been the major cause of conflicts in areas such as Naivasha and Mai Mahiu as Maasai herdsman move their cattle in search of pasture and water during the dry season.

Under extreme cases, the Maasai and Turkana have adopted non-pastoral activities like charcoal burning or engaged in various forms of employment for income. In some cases, raiding of neighboring communities was also carried out to restock. This was often considered a social activity with traditional mechanisms for resolution without degenerating into violent conflicts. However, in many places in Kenya, opportunists keen on making quick profits have hijacked this social activity bringing it into disrepute. An assessment in 1985 found that 47% of Turkana district had a moderate or serious raiding risk, and there is a feeling that the problem has worsened (Eriksen and Lind, 2006).

It is obvious that the increased frequency of drought events have challenged the effectiveness of these coping strategies. With dwindling natural resources (water and forage) there is little the pastoralists can do to create access to such resources. It is important that external players work with these pastoralists to identify ways of creating access to these resources. For instance, how can farmers be encouraged to plant fodder that can be sold to pastoralists at subsidized rates? That way, the pastoralists do not have to graze their animals in the cultivated zones and create the various conflicts that occur between pastoralists and crop farmers.

3.2 Government

For along time, Kenya did not have a comprehensive policy on environment and dry lands in particular. Initial government policies and strategies for the development of the ASALs and hence the pastoralists were influenced by assumptions, myths, and misconceptions which portrayed pastoralists as lacking in national loyalty, politically unreliable and difficult to control because of their cross border movement, hence a threat to national unity (Omosa, 2005).

Recently, government's strategies have aimed at managing rather than minimizing the impacts of drought and this has not achieved any meaningful results towards strengthening the adaptive capacity of the pastoralists. It is not yet widely understood that pastoralists compared to crop farmers take much longer to recover after drought since their economy is dependent on reproductive capital, which once eliminated often takes a

long period of time to recover. An assessment carried out by UNEP and the Kenyan government in 2000 after the 1998-2000 drought found that it takes *four* and *eleven* years to recover from *a third* and *two thirds* drop in cattle herd size respectively (UNEP/GOK, 2000). The short drought cycles being experienced of late mean that affected pastoral groups do not have time to adequately recover before another drought incident occurs. Interventions in pastoral areas should therefore focus on preservation of livestock rather replacing lost stock.

Policies on dry land resource management have not been supportive of the pastoral groups either. For example, government support for land sub-division and titling as seen in many semi-arid districts such as Kajiado and Narok in the southern part of the country has done more harm than good to pastoral groups whose livelihood strategies necessitate access to large tracts of land at different times of the year (Kameri-Mbote, 2002). Once land is allocated to individuals or private entities, the practice has been to fence and develop them. Individualization and alienation of pastoral lands in Kenya have taken place through the creation of livestock ranches, grazing blocks, national parks and game reserves and wheat farms. In the process, they have not only reduced the area available for grazing but have also blocked migration routes used during the dry seasons. Land sub-division and titling has also promoted the sedenterization of pastoralists – contrary to the fact that sedenterization is not sustainable in the fragile lands. Attempts to introduce land subdivision and individual tenure have been disruptive resulting in violent conflicts in some areas e.g. in Samburu and Marsabit (Barton et al, 2001).

The government of Kenya established the Kenya Meat Commission (KMC) in 1950 to provide reliable market outlet for livestock farmers especially in the ASALs who are affected by recurrent drought. Unfortunately, KMC has been closed for most of the time due to poor management, old equipment and poor international market for Kenya's beef. For the time it was operational, KMC played an important role as a buyer of last resort ensuring that pastoralists have a way of disposing of their stock at reasonable prices during drought. Those who sold their animals were able to purchase other animals when the situation normalized. KMC also had holding grounds that served as fattening grounds during dry periods before animals were slaughtered or exported. This way, animals sold through KMC fetched better prices.

The Meteorological Department regularly issues seasonal forecasts and early warnings to help farmers adjust to seasonal climate variabilities. Unfortunately, these forecasts rarely reach pastoral groups due to factors such as the technical language and poor timing of forecasts, the mobile nature of pastoralists, and inappropriate means of dissemination. As a result pastoralists have not in most cases been able to make use of available scientific information to plan their activities.

The Government of Kenya has formulated several policies aimed at reducing the vulnerability of the ASALs to droughts. Currently, the coordination of these policies is vested in the Department of Land Reclamation under the Ministry of Water and Irrigation whereas the implementation of these policies are being done through a sectoral approach under several line ministries, making it difficult to coordinate and come up with integrated programmes as needed in these marginal environments. Frequent movement of the coordinating department to various ministries has created confusion and in the process slowed down on-going initiatives as the department and staff re-organize

themselves. Of late however, there has been an attempt at designing a comprehensive framework for integrated management of the environment. Two policies on Disaster Risk Reduction and ASAL Development are currently in parliament awaiting approval and both propose the creation of semi-autonomous coordinating agencies to carry out the roles of disaster risk reduction (including drought preparedness) and sustainable development of ASALs rather than rely on sectoral ministries/departments that may find difficulty in getting support from other relevant departments. The Kenya Arid Lands and Resource Management Project (ALRMP), which is currently in its second phase, represents a long-term commitment by the Kenyan Government to enhance food-security and reduce livelihood vulnerability in drought-prone areas.

3.3 Developmental Agencies

Several developmental agencies and NGOs are involved in attempts at building adaptive capacities of pastoralist groups in Kenya's drylands. The World Bank is implementing the Adaptation to Climate Change in Arid Lands (KACCAL) project with the government of Canada. The objective of the KACCAL is to assist Kenya in adapting to expected changes in climactic conditions that threaten the sustainability of rural livelihoods in its arid and semi-arid lands.

Other projects in Kenya that address land degradation and agricultural biodiversity include the GEF-UNDP Project on Indigenous Vegetation which has developed useful site-based participatory planning methods in Arid Districts – using indigenous technologies for rangeland management. GEF-UNEP is working with ASAL situations through two targeted research initiatives, the Land Use Change Impacts and Dynamics project⁴ which includes southern Kenya, and the Land Degradation Assessments in Drylands project⁵). UNEP's Desert Margins Programme also seeks to address issues that pertain to the arid lands in Kenya. The UNEP/GEF Pilot Project on Integrating vulnerability and adaptation into sustainable policy and development in Eastern and Southern Africa has a pilot project in Makueni district aimed at developing practical ways through which vulnerability to drought could be reduced through participatory processes.

NGOs are also involved in a number of initiatives. For example, Oxfam has supported development of new institutional structures such as the *District Peace and Development Committees* that combines formal civil and government approaches with customary ones in dealing with conflicts in northern Kenya. The Peace and Development Network (PeaceNet Kenya) is also working to support and consolidate inclusive and integrated approaches that are rooted in mainstreaming popular participation of the ordinary people and which bring together both traditional and modern structures in taking practical action to achieve lasting peace and security. It is currently working towards resolving conflicts between the pastoralists (Maasai) and agriculturalist (Kikuyu) in Mai Mahiu.

⁴ Its main objective is to stimulate research on land use and global change in east Africa by bringing together experiences from different long term research sites to bear on common regional research themes associated with land degradation and conservation of biodiversity in the context of sustainable livelihoods.

⁵ This is a global project to assess causes, status and impact of land degradation in drylands in order to improve decision making for sustainable development in drylands at local, national, sub-regional and global levels.

4.0 Facilitating adaptation among the pastoralists in a changing climate

The government of Kenya has taken significant steps towards drought preparedness and management in recent years, however, more still needs to be done to strengthen pastoral livelihoods and build the adaptive capacity in the long run. Facilitating adaptation among pastoralists requires, the enactment of appropriate policies, the creation and/or strengthening of appropriate institutions to implement these policies and the political will by the government to address the relevant issues. Government and development partners should support adaptive strategies such as adoption of drought tolerant breeds and species of livestock.

Policies on ASALS should promote appropriate land use practices while taking into account the diverse and unique characteristics of the various livelihood groups. Because of the in equilibrium nature of pastoral environments, land Use policy for example should be a guide rather strict rules that may be difficult to implement as situations vary from one area to another. The traditional land use planning and economic strategy that favored promotion of crop farming systems at the expense of supposedly backward customary forms of pastoralism need to be corrected at this stage when discussion of the National Land Policy is going on to make it relevant to current situation.

Some of the projects on ASAL development such as the ALRMP are being coordinated from the Office of the President making it easier to get the relevant departments involved. ALRMP focuses on enhancing food security and reducing livelihood vulnerability in drought prone and marginalized communities in Kenya's arid and semi-arid districts. With funding from the World Bank, Phase I of ALRMP (1996-2003) covered 11 arid districts while Phase II (2003-2009) included additional 10 food insecure districts in semi-arid areas. The Drought Management component of the ALRMP is supposed to create a more effective drought cycle management system to minimize the need for emergency interventions and enhance response mechanisms for better action in acute drought emergencies. The good thing with ALRMP is that it has the national structure replicated at the district level in form of the District Steering Groups (DSG) where most of the planning and implementation takes place. This way, the project is able to come up with more appropriate drought preparedness and management systems since they are based on in-depth analysis and understanding of prevailing factors within a district compared to a central system covering the whole country that might not have such a level of detail. Indeed the project is looking into ways through which local indicators may be integrated and used in the early warnings.

There is need to compensate pastoralists for the environmental services/benefits provided by their lands for example hosting large number of wildlife. Compensation is one way through which landowners may be prevented from leasing their lands to cultivators migrating from the high potential areas with their unsustainable farming practices.

In the face of inequalities in water resource distribution, conflict becomes an inherent feature of their struggle for change. Conflict provides a justification needed for them to assert their claims. As a result, conflicts are inevitable, legitimate and even desirable depending on circumstances and views of the involved parties. What matters is how they are perceived and handled, determining their level of impact on livelihoods. Insecurity often forces the migrating pastoralists to move as a group creating more pressure on the

available pasture and water resources. The fact that these areas will remain inadequately policed for some time in future make it necessary for the government to recognize traditional conflict resolution mechanisms in addressing both intra-and inter ethnic conflicts. Ways must be found therefore of using the traditional institutions to complement government efforts in finding long lasting peace and security in the pastoral areas.

An organized pastoral group could play an important role in livestock marketing and ensuring that proceeds trickle down back to the group. The ALRMP for example facilitated the formation of 87 marketing associations in Isiolo District, which have not only encouraged but also enabled poor people to participate in lucrative trade in Northern Kenya (ALRMP). Pastoral associations should be strengthened as a link between government, donors and pastoral groups and could also play an important role in conflict resolution, negotiated tenure regimes for dry season and drought time grazing, management of water resources, insurance schemes, delivery of services and supply of inputs to pastoral production systems among others.

The scientific community plays an active role in strengthening pastoral livelihoods by providing this group with climate information. The fact that the traditional weather forecasting is dying due to modernization makes it necessary for institutions such as the Meteorological Department and IGAD Climate Prediction and Application Centre (ICPAC) to play a more active role in providing current, useful and useable information to pastoralists. Initiatives such as the Climate Outlook Forum (COFs) organized annually by these two organizations since 1998 generates useful information that could go along way in strengthening adaptive capacity. Studies need to be conducted to identify barriers to the effective use of weather forecasts by pastoralists and other local users with the aim to removing those barriers and strengthening their capacities to use the weather forecasts and respond appropriately to early warnings. Participation of pastoralists in COFs for example should be encouraged, as this will allow the scientific community to build upon traditional knowledge of the pastoralists and move away from monitoring drought stress on a narrow basis.

Indigenous populations have over the years developed local ways of forecasting weather. More needs to be done in terms of integrating indigenous knowledge to make the early warnings more appropriate to the users. The fact that ALRMP has stronger structures at the district level should allow for incorporation of local knowledge and make the systems more relevant. That way the local pastoralists could identify with, accept and use those forecasts. It is also important that government weather forecasters explore traditional ways by which local populations receive or disseminate climate information and use such avenues to disseminate the climate forecasts and the early warning systems.

Donor and other development partners have a role to play in ensuring improved early warning systems through sustained investment as pastoral communities may not have the resources necessary for setting up and maintaining reliable drought early warning systems. Decentralized drought early warnings and response capacities if promoted are likely to be more rapid and effective in their response compared to distant decision makers in centralized systems that may not be familiar with the situation on the ground. However, the decentralized systems must be integrated into national systems to take care of situations where needs exceed local resources. This is because early warning systems

are only useful when they trigger a timely response. What has been seen in the past is a case where government and development partners wait for evidence that people are really affected before they can respond not realizing that this stage comes late in the cycle and many people shall have been seriously affected by that time.

As Sommer (1998) argued, monitoring of drought stress should not focus narrowly on rainfall, vegetation and crop production but rather on determinants of entitlements including markets, assets, rights and opportunities to save livelihoods during drought-information that may only be accessed through direct interaction with the affected communities. This is important because pastoralists adapt their livelihoods to changing socio-economic and political situations and what is used as indicator of drought stress this year may not be necessary relevant in the subsequent years.

Much still needs to be done to reduce the impacts of disease on livestock both before and during drought. In this regard it is pertinent to:

- identify specific disease risks, particularly in drought refuge grazing areas where the risks are often great for all species of livestock,
- develop necessary veterinary infrastructure and community animal health workers including stores of vaccines and other drugs with pastoral associations or other indigenous institutions. The Kenyan government announced in January this year that they have started manufacturing a vaccine against the Rift Valley Fever (RFV) which will be distributed freely in areas affected by RFV which killed thousands of livestock. The government did not have to wait for an epidemic to do this.

While officiating over the re-opening of the KMC meat processing facility in 2000, the president also directed that relevant government departments ensure that the holding grounds are secured through acquisition of title deeds, that stock routes, boreholes and dams are rehabilitated to ensure improved livestock production⁶. This is considered an important step towards improving livestock production and market access since some of the problems bordered on the lack of political will to create a conducive environment for the pastoral groups. Such an integrated approach if implemented will ensure access to key resource areas for livestock keeping, preserve migration routes and provide access to markets elsewhere.

5.0 Conclusion

It is evident that pastoral livelihoods are under severe threats from recurrent droughts in the ASALS in Kenya. Over the years, these pastoralists have developed mechanisms to cope with these droughts. Unfortunately, these strategies are no longer adequate as the droughts have increased in frequency and magnitude. This is in addition to other compounding political, economic and environmental threats that these pastoralists face. Other players like the government and developmental partners have also developed and implemented interventions to help pastoralists adapt to these drought events and reduce their vulnerability. Some of these initiatives have been reactionary while some yielded

⁶ Speech by President Mwai Kibaki on 26th June 2006. <http://statehousekenya.go.ke/speeches/kibaki/june06/2006260601.htm>

unintended negative consequences that have exacerbated the vulnerability of these pastoralists.

It is important that a comprehensive drought contingency plan be developed to reduce vulnerability in the drylands, particularly among the pastoralists. The plan would coordinate the use of natural resources among all potential users and minimize the conflicts that have become so common between pastoralists and crop farmers in the region. There should also be a drought-coordinating agency to ensure consistency, communication, coordination and responsibility within government and between other agencies and reduce the number of inappropriate piecemeal initiatives.

Another activity that can be done to further strengthen the adaptive capacities of the pastoralists is to strengthen early warning systems and make them user-friendly and useful by incorporating indigenous knowledge systems. Many of the early warning systems are not useable by the intended beneficiaries and there is therefore the need to research into ways in which local forecasting systems can be incorporated into the early warning systems so the local pastoralists can understand and use them. This will call for capacity strengthening at the lower levels of government and at the community level for increased competencies to make sense of early warning systems. It must be remembered however that early warnings on their own may not achieve much unless matched with the required resources. Help to communities affected by drought has often come very late even where warnings have been issued as governments and development partners wait for evidence. And this often turns out to be very costly in terms of losses. The early warnings should give adequate lead-time and be clear on how potential beneficiaries should respond to them.

It is also important to recognize traditional management systems including conflict resolution mechanisms. These traditional conflict resolution systems have worked well in the past and their efficacy have largely been eroded by the introduction of western conflict resolution models, which are adversary rather than reconciliatory. New institutional structures like the District Peace and Development Committees that combine formal and customary approaches in conflict management should be strengthened.

Good infrastructure and connection to market is important for those who want to sell their animals but it must be remembered that pastoralists especially those having fewer animals do not necessarily keep animals for sale and may only be willing to do so as a last resort - when the drought is very severe. Nevertheless infrastructure such as water points to facilitate movements of stock to enable drought time grazing remains important and such should be the focus of development in ASALS.

Money is still an important resource for adaptation to droughts. It is important that credit facilities are made accessible to poor households to enable them restock after drought occurrences. This should be combined with banking and other forms of savings (other than livestock) among pastoralists in order to save the value represented by surplus male in pastoral systems. New types of insurance should also be promoted. Consistency in drought contingency funds is important in avoiding diversion of development funds to deal with disasters. Compensation for environmental services provided by pastoral lands (e.g. accommodating wildlife) should be encouraged wherever possible to prevent such areas from being converted into unsustainable uses.

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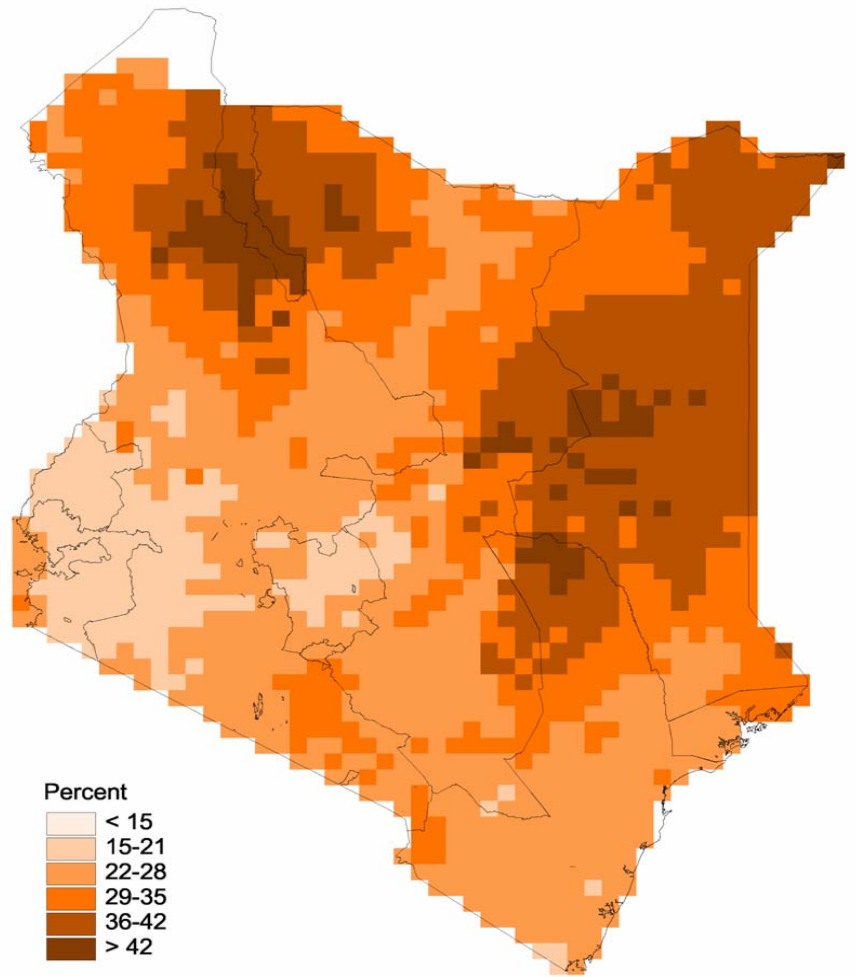


Figure 1: Coefficient of Variation of Annual Rainfall 2000 (Adapted from Thornton et al., 2006).

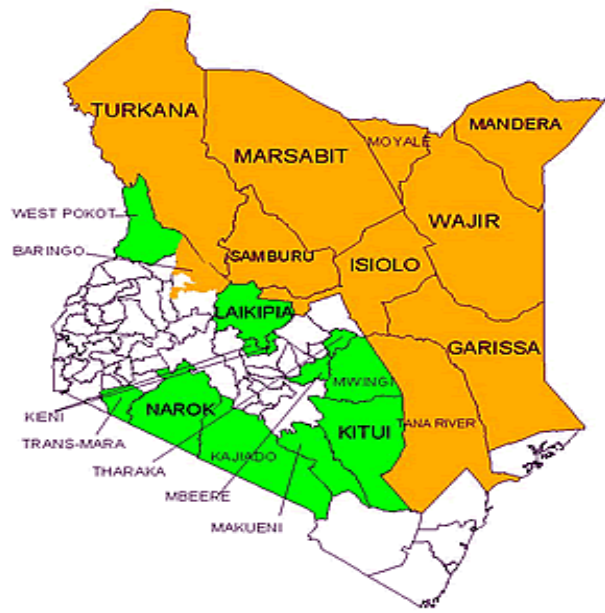


Figure 2: Drought affected districts in Kenya: Districts in brown are arid while green are semi Arid (Source: www.aridland.go.ke)

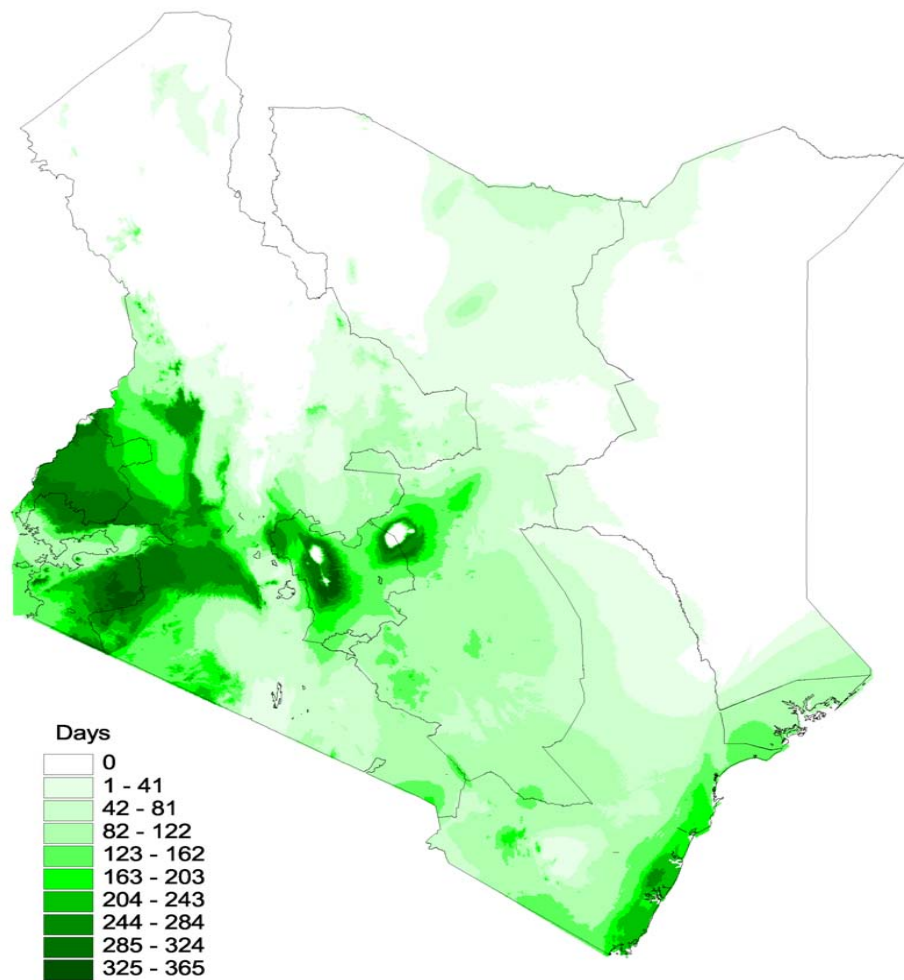


Figure 3: Length of Growing Period year 2000 (adapted from Thornton et al.2006).

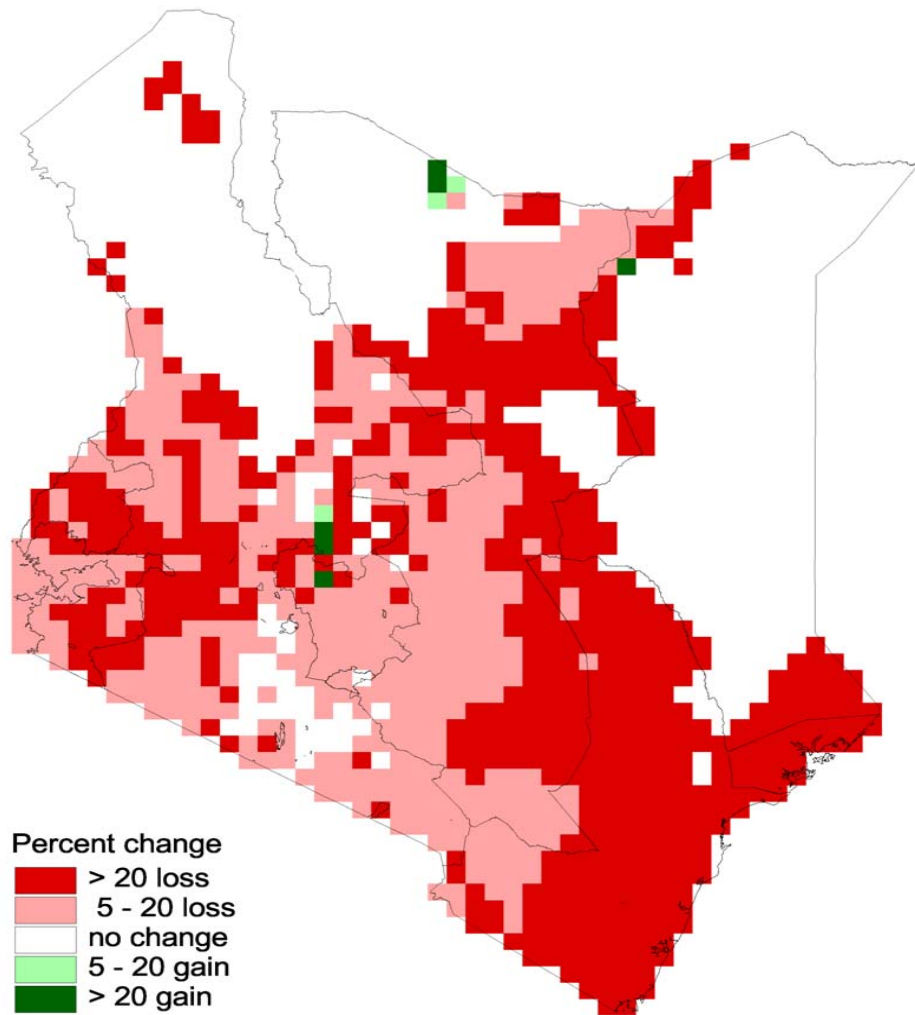


Figure 4: Change in Length of growing period to 2050 (adapted from Thornton et al.2006)