

## Impacts of Government Policies on Pastoralist Livelihoods in the Semi-Arid Areas of Tanzania

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### Abstract

Nearly eighty percent of the land in Tanzania is classified as semi-arid and the main source of livelihood in these areas is pastoralism and agro-pastoralism. Pastoralism in Tanzania is, however, under threat from the effects of human settlement and state encroachment in favour of wildlife conservation all which are increasingly forcing pastoralists off their traditional lands. The growth of the livestock population has also led to increased movement of large herds of livestock to areas which traditionally had few livestock, such as Mbeya, Iringa, Morogoro, Rukwa and Coast Regions, creating serious land use conflicts and violence between pastoralists and crop farmers. Other pressures include poor infrastructure, hostile market mechanisms and unfavourable government development policies. Most public policies do not actively support adaptation mechanisms that allow sustainable development of rangelands and are generally hostile to pastoralism. As a result, pastoralists are faced by poverty due to the negative effects of climate change like droughts and unusual rainfall patterns all which increase conflicts over dwindling natural land resources. The following key policy, socio-economic problems and their impact on pastoralism are analysed in this paper.

- Performance of public policies for adaptation and sustainable development of natural resources in Tanzania;
- Shrinking grazing lands due to human population and wildlife needs pressures
- Breakdown of traditional institutions governing the pastoralists way of life

It is concluded that with the right policies, economic plans that support it, pastoralism could be a viable and sustainable livelihood that could support many. At the same time it is also recognised that viable and sustainable alternative livelihood activities should be encouraged. Finally, it is recommended that public policies that strike a balance between restricted mobility and rangeland resources conservation, maintain pastoralist traditional institutions and adaptation to severe impacts of climate change are necessary.

**Key words:** Policies, pastoralism, climate change, sustainable development

## 1.0. Introduction

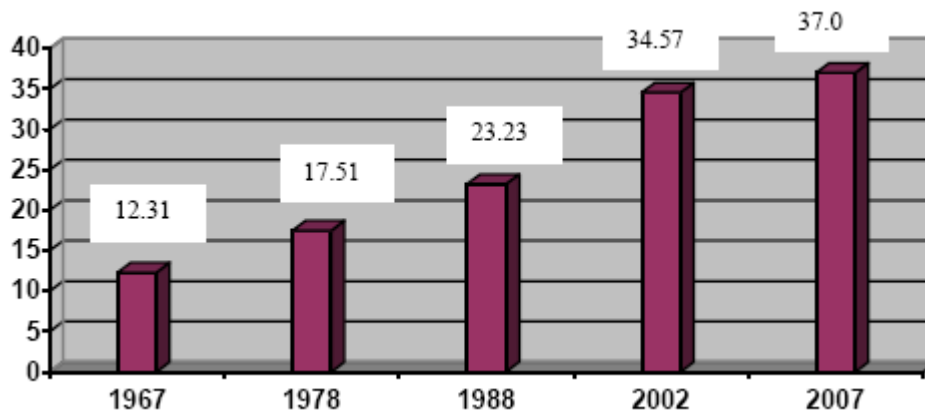
The United Republic of Tanzania consists of two formerly independent states of Tanganyika (Tanzania Mainland) and Zanzibar. Tanzania mainland has an area of 945,087 km<sup>2</sup> divided into 21 regions (Figure 1). Approximately 70% of the land is rural village land supporting 80% of the population (farmers and pastoralists), 28% is reserved land (forests, national parks, game reserves) and 2% is urban land supporting the rest of the population. The last census held in August 2002 reported a population of 34.57 persons with estimated growth rate of 2.9 percent. The population is currently estimated at 40.00 million people. Figure 2 shows the trends in the demographic growth from 1967 to 2007 (URT, 2003, 2008).

Figure 1. Map of Tanzania



Source: Kironde (2009)

**Figure 2. Population trends in Tanzania (1967-2007)**



*Source: (URT, 2003, 2008)*

Nearly 80% of the land area in Tanzania is classified as semi-arid. Grassland, dense thicket, woodland, gallery forests and seasonally inundated grasslands are found in semi arid areas (Armitage, 1996) in which the main source of livelihood is pastoralism and agro-pastoralism. The two groups dominate the livestock sector, owning approximately 99 per cent of the total livestock in the country. The big ranches and dairy farms own a mere one per cent (JOLIT, 2006-2009).

Historically, pastoralists have been marginalized socially, politically and economically (Sørensen, 2006). Available documents show that colonial and post-colonial policies have marginalized pastoralists and hunter gatherers over time. Pastoralism in Tanzania suffers from the effects of settlement, encroachment on their traditional pastures, lack of infrastructure, unfavourable market mechanisms, and difficulties of marketing their products (DANIDA, 1995).

State encroachment has often been in the form of the establishment of national parks and game reserves on traditional pastoral lands, and the subsequent exclusion of pastoralists. Pressures from the growing human population and the expansion of small scale and commercial cultivation of arable crops to meet the rising need for food, has resulted in loss of range resources (Lane, 1991; 1998). For instance, cultivation of wetlands on a small scale by local farmers or on large-scale irrigation projects has resulted in the loss of dry season grazing areas.

Other land uses, such as mining, have also deprived pastoralists of access to range resources. Wildlife conservation with its need for large tracks of land for national parks and wildlife sanctuaries is another source of pressure that is increasingly forcing pastoralists off their land (Shem *et al*, 2005). This and the growth of the livestock population has led to increased movement of large herds of livestock to areas which traditionally had few livestock creating serious land use conflicts and violence between pastoralists and crop farmers (URT, National Land Policy, 1995). These problems have led to serious breakdown of traditional institutions governing the

pastoralist's way of life and institutions of community governance (Sørensen, 2006). As such the pastoralists' capacity to effectively adapt or respond to environmental variability and the negative effects of the climate change phenomenon has been eroded (IIED/RECONCILE, 2009).

This paper critically analyses the impact of various development policies in Tanzania that currently touch upon pastoralism and their impact on pastoralist's livelihoods, livestock management systems and adaptation to the climate change phenomenon. The paper also addresses the breakdown of traditional institutions governing the pastoralist's way of life. Lastly the paper touches on the issues of migration, conflicts and violence over land resources between crop farmers and within the different groups of pastoralists.

## **2.0. The changing face of pastoralism in Tanzania**

### **2.1. Pastoral mobility**

For centuries, pastoralists in Tanzania like elsewhere, have survived harsh living conditions, through empirically developed indigenous techniques of livestock management on the rangeland, constant mobility, and seasonal migrations that combine with biodiversity conservation (Homewood and Rodgers, 1991). However, they are now confronted with shrinking grazing lands due to pressures from the growing human population, and associated need for food and land for arable crop farming. Wildlife conservation with its need for large tracks of land for national parks and wildlife sanctuaries is also increasingly forcing pastoralists off their land or to adopt sedentary livestock production systems (Shem et al, 2005,)

The traditional pastoral mobility resulted in the optimal utilization of the existing natural resources, by taking advantage of temporal and spatial variations in the distribution and quantity of rainfall and forage, as well as the best nutritional status of the forage. It was also an effective way of risk management through evading of drought conditions and actual or potential disease or pest outbreaks, which usually depend on climatic conditions. Additionally, pastoralism helped to avoid the over exploitation of the natural resources by reducing concentration of livestock in one area, thus leading to conservation of the biodiversity.

Pastoralists and their livestock must possess a high degree of resource utilization mobility in order to respond to temporal and spatial variation in the distribution and quantity of rainfall and forage (Homewood and Rodgers 1991). Mobility also enables pastoralists to manage disease risks by avoiding known area of infestation (Shem *et al*, 2005).

Despite the extensive documentation of the efficacy of indigenous pastoral systems in Tanzania and elsewhere (Benhke and Scoones, 1993), negative perceptions still

pervade pastoral policy and management, especially with regard to livestock mobility and the migration of pastoralists to new territories outside their traditional areas (Galaty, 1993). It has become a norm in policy making circles to castigate pastoralism as being an irrational system that destroys the environment. Pseudo-technical assertions that blame pastoralists for environmental degradation and desertification have no scientific basis.

Despite all the scientific evidence and the countries dependence on pastoralists and agro-pastoralists for all its meat and milk needs, recent years have seen pastoralist production systems operating under growing pressure and pastoralist communities becoming increasingly impoverished (Kipuri and Sørensen, 2008). Pastoral land continues to be annexed for uses which are perceived as more productive, such as conservation, commercial agriculture, mining, ranching and tourism.

The above problems and growth of the livestock population has raised demand for grazing land, and has created serious soil erosion problems in some areas due to overgrazing. Increased movement of large herds of livestock to areas which traditionally had few livestock, such as Mbeya, Iringa, Morogoro, Rukwa and Coast Regions, resulted in serious land use conflicts (URT, National Land Policy, 1995). The latter policy calls for the modernization of pastoralism.

## **2.2. Sedentary livestock production**

Modern rangeland management and forced sedentarization also advocated in the Livestock Policy of 2006 is inspired by practices that were adopted from totally different and irrelevant eco-social regions (such as the western prairies of North America, Australia and New Zealand). Methods and philosophies of “carrying capacity” and other management tools considered “scientific” come from alien eco-social systems, and have been shown to be deficient when applied in the East African pastoralist context (Behnke and Scoones, 1993; Homewood and Rodgers, 1991).

Evidence from Botswana and Mali confirms that animals reared in mobile systems are up to three times more productive per hectare than those reared under similar climatic conditions in ranches or sedentary systems in either Australia or the USA (Shem *et al.*, 2005).

Not all sedentarization is forced. There are instances where sedentarization has originated from the pastoralists themselves, sometimes to access infrastructure such as schools, hospitals and markets, or sometimes because of drought and the loss of their animals (Fratkin *et al.*, 1999).

In more recent years pastoral communities have been dealing with the aftermath of the long droughts, which has devastated their livelihoods, by making more opportunistic use of their land, like diversifying into cropping, keeping fewer and faster growing animals and by taking on paying jobs. Members of the communities who diversified into agriculture had higher chances of maintaining their livelihoods during droughts than those who relied on animals alone (ILRI, 2008).

Pastoralists in Tanzania are therefore faced by a number of challenges that hinder their way of life and stifle their ability to adapt to changes in the current external

social-economic, climatic and political environment. These include inappropriate development policies; political and economic marginalisation, increasing resource competition, breakdown of traditional institutions governing the pastoralist's way of life, migration (accompanied by conflicts violence) and climate change all which impacts on pastoralist's livelihoods.

### **2.3. The impact of policies on pastoralist livelihoods**

In principle, government policies are supposed to address issues that improve the welfare of the people, and for a country that is committed to eradicating pervasive poverty, policies are expected to be pro-poor. However, given that the country has embraced economic liberalization; many policies have been formulated to facilitate economic liberalism in all its dimensions. Although driven by noble objectives, these policies and associated reform processes will in practice affect different communities in different ways. This in part reflects the difficulty central level policy making has in accommodating the huge diversity of Tanzania's environment and natural resources, and the very varied manner in which its citizens derive their livelihood (Shem and Matee, 2006).

It is therefore important to look at pastoralism in the context of the country's current rapid pace of policy change. At the national level there are macro or cross cutting policies, sector policies as well as sub sector policies (Tenga *et al.*, 2008). Macro or cross cutting policies are those policies whose implementation involves several ministries or cuts across several sectors. They include the Tanzania National Vision 2025, The National Strategy for Growth and Reduction of Poverty (NSGRP) and several other economic policies that provide the overall framework for the formulation and implementation of other (sector) policies.

The NSGPR 2005-2010 recognises pastoralism as a sustainable livelihood and states that one of its goals is "*promoting efficient utilisation of rangeland, empowering pastoralists to improve livestock production through improved access to veterinary services, reliable water supply as well as recognising pastoralism as a sustainable livelihood*".

The National Land Policy adopted by the Government in 1996 (MLHUD, 1996) puts pastoral concerns at the periphery of policymaking. While acknowledging the 'growing social conflicts, environmental concerns and land use conflicts due to haphazard alienation of rangelands for large scale agriculture, the Policy blame pastoralist for encroaching into agricultural lands and causing conflicts with other communities and land degradation.

The majority of the development policies in Tanzania are still based on the notion that pastoralism is not the most efficient use of land (Oxfarm international, 2008). As a result, over the years and up to now, pastoralists have continually lost land to other users, as their lands continue to be converted to farm land by small and large scale farmers and to conservation in the form of game parks, game reserves and game controlled areas (Matee and Shem, 2006, Sendalo, 2009).

Matee and Shem, (2006) identified and analysed the impacts of existing and emerging policies and laws with a bearing on pastoralism in Tanzania. The authors reported that while some policies do provide opportunities for pastoralists, other show little understanding of pastoral production systems or recognition of pastoralism as a sustainable livelihood. This is probably due to two main factors: 1) lack of knowledge about pastoralism among policymakers, and 2) pastoralists lacking a clearly articulated voice and influence in the policy debate. Even the new Livestock Policy, 2005 fails to acknowledge the genetic potential of indigenous livestock breeds and landraces, or the wisdom of extensive grazing regimes in dry land areas.

The National Land Policy of 1994 and the Village Land Act of 1999 make legal provisions for securing land rights for extensive grazing systems. However, these are not widely known or exploited, and certain aspects of the Land Act of 1999 have been described as “the last nail in the coffin of pastoralism”. Efforts to secure land and resource tenure for pastoralists are generally very limited, and crop growers and private investors continue to appropriate large swathes of pastoralist land, often with direct or indirect support from government and development agents.

#### **2.4. Political and economic marginalisation**

Often, political imperative drives the formulation of a specific policy. This is sometimes in response to an intensive, broad-based and highly visible lobbying on a particular issue. For example the decision to evict pastoralists from *Mbarali* in Southern Tanzania, while justified by the need to conserve the environment, in actual fact was driven by the need for the government to be seen to take decisive steps to address the critical power shortage which was becoming too politically sensitive (Tenga *et al.*, 2008). In the eyes of the state, pastoralists represent a “minority vote”, occupy large areas of land in semi-arid areas of low economic potential and practice a livelihood system many consider to be economically inefficient and environmentally destructive.

Likewise, the government is currently promoting the commercialization of agricultural production, including livestock. The desire to commercialise goes hand in hand with steps to strengthen the private sector, which is supposed to drive the commercialization process.

The government has accordingly facilitated the formation of the National Private Sector Forum, the Investors Round Table of Tanzania, the Tanzania National Business Council, and Regional Business Councils in all the Regions of Tanzania. All these are forums that are expected to negotiate with the government to ensure that commercial interests are well accommodated in national policies (Tenga *et al.*, 2008). At the local government authority level, District Councils and village governments have adopted policies that are meant to attract private investors to their areas.

Generally, there is considerable interference in pastoralism by policy-makers, development planners and governments “in their common anxiety to modernise livestock production and the pastoralists”(Matee and Shem, 2006). With their lands being encroached upon by both the State and private sector, pastoralists urgently need to make their voices heard and influence the policy process.

The latter authors concluded that the current policies are largely unfavourable to pastoralist livelihoods and are frequently informed by myths and preconceptions reflecting colonial ideas about rangeland management and outmoded development models based on flawed modernisation theories. The following are some examples of decisions and activities that have resulted in the alienation of pastoral lands by state and private interests (Matee and Shem, 2006):

- About 2.5 million hectares (25,000km<sup>2</sup>) of village and public lands is currently being expropriated for allocation to investors through the Land Bank, under the Tanzania Investment Act of 1999.
- Under the Wildlife Conservation Act of 1974, 3.5m hectares (34,605 km<sup>2</sup>) of the land managed by pastoralists is gazetted as Game Controlled Areas, where the Minister for Natural Resources and Tourism may make decisions on land use without recourse to the village, district or Parliament.
- Establishing national parks or game reserves on traditional pastoral lands excludes pastoralists from grazing lands, while expanding cultivation and wildlife reserves or parks reduces rangeland resources and increases pressure on the remaining rangelands. Increased incidence of livestock diseases, especially in villages bordering national parks, has led to cattle losses, destitution among pastoralists and long-distance migration to other parts of the country.
- Cultivation of wetlands (on a small scale by local farmers, and by large-scale irrigation projects) that leads to a loss of dry season grazing zones.
- Preventing trans-boundary migrations disrupts seasonal grazing patterns.
- Establishing mineral mining zones in pastoral areas that deprive them access to pastures.
- In some cases, public ownership can undermine sustainable natural resource management: for example, when public wells replace privately owned wells, which are sometimes the only instrument for controlling access to pastures and preventing overgrazing.
- Market distortions caused by expansion of the crop sector and large investments in crop production (e.g. donor-driven projects) are fuelling encroachments into 'marginal' drylands (i.e. rangelands)
- Decentralisation that does not address the needs of mobile populations.

Finally, geographical and climatic challenges have exacerbated pastoralist's marginalization and increasing their access to appropriate education and institutional support would enhance their chances in engaging in policy making processes.

## **2. 5. Increasing competition for resources**

Tanzania is constantly under pressure both from internal and international environmental organisations, conservationists, and hunters associations to increase areas under conservation and to increase restrictions in areas already conserved (Sendalo, 2009). This is directly and indirectly reflected in recent policies and legislations like for example the Forest Policy of 1998, the Community Based Forest Management Guidelines of 2001, the Forest Act of 2002, the Environmental Management Act 2004, the Wildlife Policy of 1998, the National Livestock Policy of



2006, the Strategic Plan for the Implementation of the Land Acts (SPILL, URT 2005d).

The pastoral people in Tanzania have been the most affected group by national parks and wildlife conservation policies and practices introduced recently in the country. In pre-colonial times, the Maasai and other pastoral groups controlled a vast area stretching from central Kenya to central Tanzania. Today, they occupy less than two thirds of their former territory and there are indications that this will go on dwindling (Kaare, 1996, Okoth-Ogendo, 1992). Wildlife conservation policies, characterized by the creation of exclusive wildlife protected areas (Figure 3), and state-sponsored agriculture both large and small scale and commercial ranching have been responsible for this plight of the pastoral peoples in dry land ecosystems of Tanzania (Lane, 1991, 1994, Scoones, 1995, Mustafa, 1997).

Establishment of National parks and Game Reserves also known as protected or conservation areas (Figure 3) are frequent sources of conflicts in many parts of Tanzania. Environmental conservation has been a major factor in the promulgation of policies that have impacted negatively on pastoralists. The Wildlife Policy of 1998, the National Environmental Policy of 1997, the Wildlife Act of 2003 and the Grazing Areas and feeds Act (2010), all seek to protect from degradation and to regulate the use of the natural resources that have traditionally been used by pastoralists. These policies have, by and large, worked to the detriment of pastoralists, who have consistently been blamed for environmental destruction of the natural rangelands, and for which the government is determined to stop (Matee and Shem, 2007).

The eventual efficacy of the Grazing Areas and Feeds Act (2010) is doubtful given the underlying policy paradigm that refuses to acknowledge the superiority of the traditional range management techniques suitable for “non-equilibria” range conditions (semi-arid, marginal and subject to constant seasonal variations). While a rhetorical acknowledgment is made towards traditional practices, policy implementation is negative to mobility and transhumance, which is the key to the system. Earlier (Mattee and Shem, 2006) reviewing the draft act concluded as follows:

*“There has in the past been a close and relatively harmonious association between livestock and wildlife. It has also been suggested that pastoralists have had a significant influence on the evolution of the ecology of the areas they inhabit, including the type and distribution of wildlife species (Homewood and Rodgers, 1991). Pastoralists have adapted to and influenced their environment without destroying its sustainability (Ghimire and Phimbirt, 1977).”*

Competition for resources such as grazing and water between livestock and wildlife is a major concern among pastoralists in many pastoral areas. Wild ungulates are important, or potentially important, in the spread of several viral diseases of concern to livestock producers.

Figure 3. Wildlife Protected Areas of Tanzania



Diseases control and treatment are among the common costs to any community that integrates wildlife and livestock in the same habitat. Predation of livestock and humans is often cited as a major risk by pastoralists (and indeed non-pastoralists) who live near wildlife sanctuaries. Damage to crops and infrastructure by wildlife is also a key issue.

Although wildlife constrains land use for pastoralists, opportunities from wildlife may be incorporated into pastoralist's livelihood strategies, especially through community-

based natural resource management in areas that possess 'sufficient' wildlife for sustainable use through consumptive and non-consumptive means.

In practice, however, the potential for wildlife to contribute to the sustainable rural livelihood strategies of pastoralists is constrained by a number of factors. Some of these factors include the perceptions of the cost and benefits of wildlife, national and international wildlife legislation, natural resource tenure, the degree of community homogeneity, and the quality of institutional management (Talbot and Olindo, 1990; Nelson, 2004).

## **2.6. Breakdown of traditional institutions governing the pastoralist's way of life,**

The basis of pastoral organization is the clan, a set of patrilineally -related households traced in theory to an apical ancestor that is based on system of age-sets. Among the Massai, for example, men born within a seven-year cohort fall into named age-sets and these have rights and privileges within society, as well as acting as a powerful force for cohesion and a calendrical system (Shem *et al*, 2005).

Maintenance of gender relationships which reflects a set of behavioural norms ascribed to men and women in a given social group or system is also key to the survival of traditional institutions among the pastoral communities. Gender reflects attitudes and beliefs that a particular cultural group considers appropriate for males and females on the basis of their biological sex. As such the allocation, distribution, utilization and control of resources reflect gender relations embedded in both ideology and practice. For example, Maasai women play an important role in selecting animals for breeding. Owing to their daily contact with cows while milking them, Maasai women are able to monitor the animals closely and are responsible for milk management; the income from selling milk products is controlled by women. Women and children may possess their own animals, which are managed together with the herd of the boma (Syed *et al.*, 2003).

During the last three decades Tanzania has experienced major migrations of pastoralists and agro-pastoralists. These migrations have involved moving with their livestock to new areas or movement of certain age and gender groups in search of alternative income earning activities. Women are left at the semi-permanent house (hut) with the entire responsibility of managing the household (including, perhaps, a farming plot), as well as children and livestock left behind (particularly young, sick or milking animals. Due to the disruptive nature of sedentarization, traditional institutions for conflict resolution have become weakened as men move to distant areas in seek of pasture (Shem *et al*, 2005).

Experience also show that although positive, the introduction of socio-economic institutions such as schools has been destructive to the lifestyles, livelihoods and value systems of nomadic pastoralists (Shem *et al.*, 2005). The children of pastoralists attending such schools are always alienated from their cultural and livelihood heritage and learn to disdain their parent's way of life in favour of false expectations of a settled, urban life with professional jobs which most are never able to attain. This has contributed in the medium and long-term, to the breakdown of pastoral institutional

order and reduction of rural productivity. It has also led to the erosion of the most valuable indigenous knowledge systems for sustainable resource management.

## **2.7. Migration and conflicts over land resources**

The drivers of conflict in East Africa are complex and many. However, increasing poverty due to reduced mobility, lack of alternative livelihoods, confused and competing rights, entitlements and poor provision of basic needs and increasing human and livestock populations all aggravate conflicts. For example, surveys (Shem *et al.*, 2005) show that existing number of cattle in Tanzania has already surpassed the normal carrying capacity in most of the areas. Increasing land scarcity and conflicts of interest between different land users in these and other areas have implied that huge numbers of people have migrated in search of arable land and pastures elsewhere.

Additionally, the growth of the livestock population has led to increased movement of large herds of livestock to areas which traditionally had few livestock, such as Mbeya, Iringa, Morogoro, Rukwa and Coast Regions, creating serious land use conflicts (URT, National Land Policy, 1995, Sendalo, 2009).'

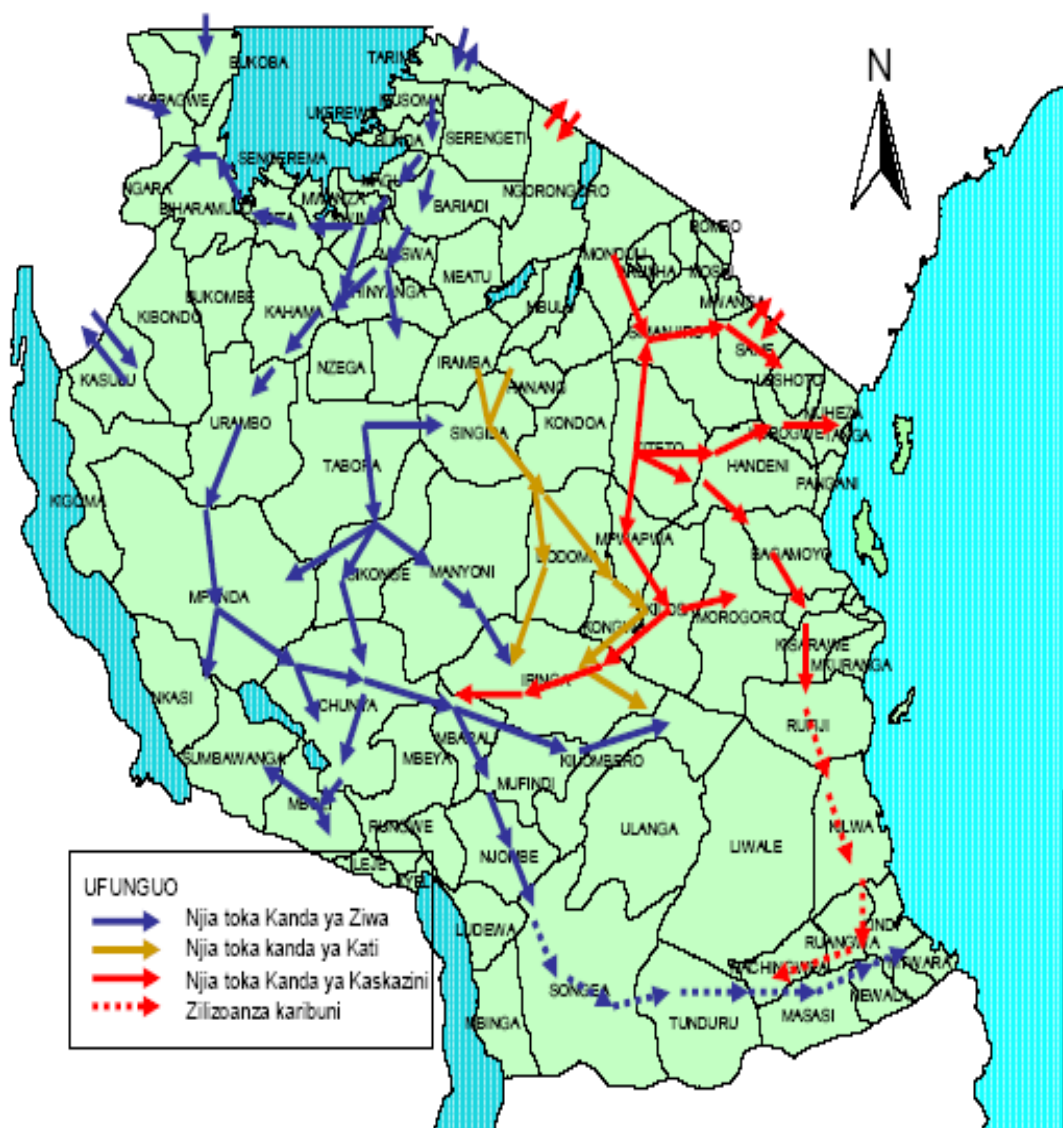
Worse, as they lose their land, some pastoralists become sedentarized, while others migrate to new areas (Figure 4) often occupied by crop farmers, resulting in conflict and sometimes violence, particularly over the allocation of land and water resources. Many pastoral households in Tanzania have already fallen victim to these pressures and have left livestock production without being able to find alternative livelihoods (Shem *et al.*, 2005).

As a result of immigration, unplanned movements and sedentarization, civil conflicts have been occurring between livestock keepers and farmers over grass and water for the animals in *Morogoro*, *Mara* and *Kilimanjaro* regions. Similarly due to mass exodus of cattle keepers in search of animal feeds, school attendance by pastoralist children has gone down. This has led to calls for policies that support sedentary modes of livestock production

However, in some areas the immigrant pastoralists and the indigenous ethnic groups, mainly agriculturalists, have forged complementary co-existence, the best case scenario is found in the *Usangu* plains in *Mbeya* region, Tanzania (Kajembe *et al.*, 2003). The migration of pastoralists to areas of higher productivity alleviates stress on less productive or exhausted land. Conversely, if the movement of pastoralists is restricted, already marginal land becomes more overused.

Areas that are marginal in terms of fertility and situated in semi-arid parts of the country with erratic rainfall are now increasingly being used for cultivation. The effects of this are aggravated by the fact that the majority of people cultivating in these areas cannot afford to use any inputs to maintain/improve soil fertility (Nielsen *et al.*, 2005, Odgaard *et al.*, 2005). Other implications of the spread of cultivation into marginal areas, is diminishing access to grazing areas (Odgaard, 2005, Mattee and Shem 2006). An increasing number of land conflicts are now occurring between different interest groups and between various types of land use. (Odgaard 2005, Ojalammii 2006).

Figure 4. Southwards pastoral migration routes in Tanzania



Key: Blue line or 1<sup>st</sup> Route from the Lake zone  
Brown line or second route from central zone

Red continuous or 3<sup>rd</sup> route from Northern route  
Red and blue dotted or 4<sup>th</sup> route from recent routes

## 2.8. Climate change

Tanzania is undergoing extremely rapid land use change including expansion of cropping activities into savannah lands, increasing irrigation, deforestation, and urbanization. Worse still like other countries in Sub-Saharan Africa, the country is likely to suffer the greatest impacts of the twin threats of global warming and increasing climate variability.

Climate change is expected to further shrink the rangelands which are important for livestock keeping communities in Tanzania. This shrinkage will be more aggravated by the fact that about 60% of the total rangeland is infested by tsetse fly making it unsuitable for livestock pastures and human settlements (Nassef *et al*, 2009). Shrinkage of rangelands is likely to exacerbate conflicts between livestock keepers and farmers in many areas. On more commercial basis, crop and animal production has been affected negatively in areas with decreasing rainfall and vice versa.

In the next 10–15 years Tanzania will see a continuation of current trends of successive poor rains, an increase in drought-related shocks, and more unpredictable and heavy rainfall events. Beyond this period the Intergovernmental Panel on Climate Change's climate models for East Africa show an increase in temperature of up to 2–4°C by the 2080s, with more intense rain predicted to fall during short rains (October–December) over much of northern Tanzania as soon as the 2020s, and becoming more pronounced in the following decades (Oxfarm International, 2008).

The first and most obvious response to drought is to move the animals to areas where there is still pasture and water. This is probably the major determinant for the expansion of pastoralism especially in the case of the southward movement in the country. In the pre-colonial era, pastoralist's migrations were limited principally by disease and more occasionally by insecurity. In the present century, these have taken second place to the occupation of land by cultivators, wildlife and the presence of boundaries that impede free passage.

Climate change is likely to bring about even more erratic and unpredictable rainfalls and more extreme weather conditions such as longer and more frequent droughts. Where this happens, the delicate balance on which pastoral systems depend is undermined as the quality, quantity and spatial distribution of natural pastures are mainly shaped by rainfall. Predicted changes in rainfall patterns are bound to result in increasingly scarce, scattered and unpredictable pastures. As a result, access to pastures will become more difficult, leading to loss of livestock and livelihoods.

Pastoralists could also benefit from climate change. More rainfall could result in more dry-season pasture and longer access to wet-season pasture. It could also result in less frequent drought, which may mean more time for people to rebuild their assets between lean times. However, there are also significant negative consequences including loss of livestock through heat stress, loss of land to agricultural

encroachment as the rise in rainfall raises the productive potential of arid areas, an increase in frequency of flooding, and the spread of human and livestock diseases that thrive during the wet season.

Responding to climate change will require a long-term approach to provide the investments necessary for appropriate and sustainable development, allowing pastoralists either to adapt to their changing environment, or to transition out of pastoralism into alternative livelihoods (Nassef *et al*, 2009). The latter authors argue that this must be effected through a rights-based approach, to increase the integration of pastoralists into political, social and economic systems at national and regional levels, thus addressing the fundamental problems of marginalisation and weak governance that lie at the root of the chronic poverty and vulnerability of pastoral areas.

However, Tanzania like many African countries currently has limited capacity to adapt to changing climate and extreme weather conditions such as drought and floods which greatly affect and continue to affect pastoralists. Considerable investments are needed to build local adaptive capacity so that the country is better able to respond to the challenges that climate change presents. Most of the major public policies and legal framework lack entry points or are weak to support implementation of priority management options that could enhance pastoralist's livelihood and resilience against impacts of climate variability and change (Tenga *et al*, 2008).

### **3.0. Conclusions and Recommendations**

Longstanding negative perceptions of pastoralism as a backward production system must be replaced by a recognition of the rationale of such systems in dryland areas. Policies and programs should be put in place to support local resilience and adaptive capacity to climate change. Climate change should result in pastoral communities being seen as custodians of degraded and un-degraded rangelands as policy adapts and politicians recognise the huge contribution these mobile systems can make economically, socially and, environmentally. Removing policy obstacles will allow pastoralism to function unimpeded and help ensure the resilience of the semi-arid dry lands and their communities in the face of climate change.

Policies that strike a balance between restricted mobility and rangeland resources conservation, maintain pastoralist traditional institutions and adaptation to severe impacts of climate change should be formulated. With the right policies, economic plans and support, pastoralism could be a viable and sustainable livelihood that could support many. At the same time it should be recognised that viable and sustainable alternative livelihood activities should be encouraged.

For those pastoralists still practicing their traditional way of life, as well as those who have lost their livestock and abandoned the traditional pastoralist way of life, various forms of social protection will be essential.

The following policy recommendations are necessary if conservation of rangelands in the semi-arid areas of Tanzania is to be attained:

- Enabling herd mobility, both seasonal and as a response to drought, while securing rights to critical resources (dry season pastures and water).
- Climate adaptation should be mainstreamed into dryland plans and strategies at national and local/district level and at sectoral levels, such as disaster risk reduction, livestock development and agriculture.
- Better awareness of how to access and use climate projections is required at different levels of planning and implementation.
- Full socio-economic costs and benefits estimates should be calculated for different adaptation strategies involving pastoralists. The costs and benefits should consider livelihoods, ecosystems and wider economic contributions.
- Action research is required to build and share knowledge on climate adaptation by pastoralists and to share and disseminate learning to key regional and national institutions.
- Supporting pastoral livelihoods through better water access and tailored service provision, and supporting livelihood diversification, for instance in the areas of ecotourism and conservation.
- Building robust conflict management institutions and effective drought mitigation systems, including early warning, insurance and safety nets.
- Strengthening the capacity of pastoral groups to engage with debates on policy issues directly affecting their lives and livelihoods.
- Ensure effective public information campaigns to help people understand and respond to the climate change challenges faced in different regions and districts
- As most pastoralists live in some of the poorest countries in the world, efforts by the governments must be supported by richer countries particularly as these bear the main responsibility for climate change.



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