

# Survival of the fittest

## Pastoralism and climate change in East Africa

Climate change is having a destructive impact on many groups around the world. Pastoralists in East Africa have been adapting to climate variability for millennia and their adaptability ought to enable them to cope with this growing challenge. This paper explains the policies required to enable sustainable and productive pastoralist communities to cope with the impact of climate change and generate sustainable livelihoods.

## Summary

In sub-Saharan Africa mobile<sup>1</sup> pastoralism is predominantly practised in arid and semi-arid lands. These lands are hot and dry, with low and erratic rainfall. There are not many livelihoods suited to this unpredictable environment, but pastoralism is particularly appropriate, because it enables people to adapt by moving livestock according to the shifting availability of water and pasture.

Pastoralism makes a significant contribution to gross domestic product (GDP) in many East African countries (around ten per cent in Kenya); it provides the majority of meat consumed in those countries; and provides a livelihood for tens of millions of people who live there. Pastoralists are the custodians of dryland environments, providing services through good rangeland management including biodiversity conservation, and wildlife tourism.

Despite providing such value, pastoralist areas in East African countries tend to have the highest incidence of poverty and the least access to basic services compared with other areas. In the pastoralist areas in northern Uganda, 64 per cent of the population live below the poverty line, compared with 38 per cent nationally.

### The challenges

Pastoralists face a number of challenges that hinder their way of life and stifle their ability to adapt to changes in their external environment. Taken together, these challenges account for the poverty and lack of essential services. They can be grouped into four main categories: climate change, political and economic marginalisation, inappropriate development policies, and increasing resource competition.

#### *Climate change*

Pastoralist communities across East Africa are starting to learn to live with the reality of climate change, adapting as they can to its impacts. In the next 10–15 years this will mean a continuation of current trends including successive poor rains, an increase in drought-related shocks, and more unpredictable and sometimes 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 in the short rains<sup>2</sup> (October–December) over much of Kenya, Uganda, and northern Tanzania as soon as the 2020s, and becoming more pronounced in the following decades. Pastoralists could benefit: 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.

### *Political and economic marginalisation*

For decades pastoralists have been side-lined in decision-making processes in East Africa. The result is chronic under-investment in pastoralist communities across the region, and the consequent increase in vulnerability. Pastoralist communities are marginalised on the basis of their geographical remoteness, their ethnicity, and their livelihood, which is still seen by many governments across the region as an outmoded way of life that needs replacing with 'modern' livelihood systems. All too often pastoralists are not aware of their rights and have no experience of accountable government. Therefore they have been unable to defend their traditional land rights and request the improved provision of basic services. Services such as health and education are not adequately provided nor adapted to the population of the drylands of East Africa. Furthermore, there has been a severe lack of either public or private investment in infrastructure and economic development in arid areas, combined with poor access to markets. The net effect is one of increasing insecurity. The Jie people of Karamoja in Northern Uganda are a case in point. The district administration is unable to address the needs of the Jie as its allocation from the central government is low and its own revenue minimal. There is little work available in the towns to provide an alternative or supplementary income and food insecurity in Karamoja has increased significantly, with communities now dependent on relief food distribution since the 1980s.

### *Inappropriate development policies*

For most of the twentieth century, rangeland management in Africa followed a model imported from the temperate grasslands and stable conditions of North America. This meant that development focused on a push towards settling communities, with bore-hole drilling (encouraging communities to cluster around water sources), and the assignment of fixed grazing lands to pastoralist communities, denying pastoralists their traditional land rights. But in Africa's harsh and hugely variable drylands the model failed, resulting in overgrazing. It is spatial distribution of livestock rather than their number that must be managed to avoid overgrazing in arid lands, thus highlighting the critical importance of mobility in dryland resource management. In Wajir, Kenya this kind of development approach has led to a reduction in wet season grazing land, leading to fewer areas of fresh pasture following the rains, while the areas grazed in the dry season get no chance to recover; drought reserve areas have all but disappeared. Today the dry or wet season grazing areas no longer exist due to the proliferation of settlements. As a result of this constrained mobility, pastoralists report an increase in stock density, a reduction in palatable grass and browse, and a decline in milk production for all species.

### *Increasing resource competition*

Over the past few decades greater pressure has been put on pastoralist grazing lands and water resources, as populations have increased and grazing land has been taken for cultivation, conservation areas, and state use. In Tanzania, conservation areas have led to more land being taken from pastoralists than all other factors put together. 95 per cent of Monduli District, which is at the heart of Maasailand have been set aside for conservation even though more than one third of protected areas in

Tanzania have traditionally belonged to pastoralist communities. Pastoral livestock have been squeezed onto lands that are too small to be sustainable for pastoral production as pastoralists rely on freedom of movement to be able to manage the rangelands effectively. Key resource areas, for example dry-season grazing lands, are a target for agricultural use because of their productive potential. Once pastoralists lose these key resource areas, their whole strategy for dealing with drought is compromised. Furthermore, the livestock population is not growing at the same rate as the human population; livestock numbers in East Africa have remained fairly constant over recent years because of disease epidemics and starvation associated with floods and recurrent drought. The result is more pastoralists reliant on fewer livestock. Resource competition significantly increases the risk of conflict between different groups of land users. This risk is greatest during times of stress, for example drought or floods, when available resources are even more restricted. Increasingly, many pastoralists can no longer rely on livestock alone to provide them with a livelihood, yet other income-earning opportunities remain limited, as the growing number of the thousands of destitute ex-pastoralists shows.

### **Addressing the challenges**

Years of political and economic marginalisation, inappropriate development policies, an increase in resource competition, and an increase in abnormal climatic events have reduced the ability of some pastoralists to maintain a sustainable livelihood. Whether increasing climate change will see a worsening of their current situation or whether pastoralists will be able to adapt and even take advantage of the opportunities it may bring will depend on how these environmental and developmental challenges are tackled by both national governments and international donors, and the extent to which pastoralists themselves are involved in the process.

Pastoralist communities need more investment in good basic services such as health care and education, flood-proof transport and communication links, financial and technical support services, livestock-marketing opportunities, drought and flood mitigation and preparedness systems, access to climate information, and effective conflict-mitigation mechanisms. Both women's and men's needs and interests must be taken into account. Civil society and local communities need support to build strong and representative pastoral organisations. Governments need to strengthen the accountability and responsiveness of their institutions to pastoralist needs.

Governments must in addition support the activities that pastoralists themselves are already undertaking in order to deal with climate variability and climate change. Pastoralists have long used traditional livestock and land-management strategies in order to manage drought and flood cycles, alongside community support schemes.

Adaptation to climate change also involves the movement of some people out of pastoralism and into other livelihoods. As much as pastoralism is in itself a viable economic activity, there is also a need to create alternative livelihoods for women and men who have dropped out of pastoralism, to alleviate the growing population pressure on the land, as well as to increase the range of cash sources available to pastoralist families.

As a sustainable livelihood that contributes little in the way of emissions, pastoralism, if adequately supported, can play a valuable role in limiting the extent of global climate change by promoting reforestation and carbon sequestration through good rangeland management.

Pastoralist communities could have a sustainable and productive future in a world affected by climate change, given the right enabling environment. Pastoral production systems have to be secured and strengthened as the core use of the arid and semi-arid land areas, alongside the creation of new and alternative livelihood opportunities. For this to happen, the following action is necessary:

**National governments in East Africa must:**

- Recognise and protect pastoralists' land and resource rights, ensuring that women have equal rights to men and recognising that pastoralism depends on freedom of movement for herds between pastures and water sources.
- Put an end to inappropriate development policies aimed at pastoralists, including encouraging settling communities through inappropriate borehole drilling and the assignment of fixed grazing lands to pastoralist communities.
- Empower pastoralist communities to influence policy and implementation at the national level, including the planning of climate-change adaptation strategies.
- Create positive diversification for pastoralists and alternative livelihoods for ex-pastoralists through investment in education for women and men to ensure salaried employment both outside of and complementary to pastoralism.
- Acknowledge and address the specific needs of ex-pastoralists in national and regional development strategies given that this group is unlikely to re-enter pastoral production.
- Provide social welfare support to pastoralist communities in the form of cash payments in place of food aid to enable the members of pastoralist communities meet their basic needs in terms of food, health care, and education.
- Ensure that appropriate mechanisms are in place to manage conflict between pastoral groups and others, and enable practical early warning of conflicts and rapid response through the provision of adequate funding and resources. This should build on existing traditional conflict-resolution mechanisms.
- Negotiate appropriate mechanisms within the East African Community and the Intergovernmental Authority on Development to enable cross-border migration and conflict resolution, building on experience in West Africa.
- Work with the African Union to develop a pastoral policy framework to provide co-ordinated policies of the kind outlined in this paper, with a special emphasis on cross-border issues, including livestock movement,

marketing, disease control, conflict management, and freeing up cross-border trade in livestock products and commodities.

**National governments in East Africa, supported by climate-change adaptation funds provided by rich countries must:**

- Invest more in appropriate development initiatives that have climate-change adaptation integrated into them in pastoralist areas.
- Reward pastoralists financially for all the environmental services they supply through well-managed pastoralist grasslands.
- Establish an accurate early-warning system for droughts and floods, similar to that already in existence in Kenya, with international donors responding rapidly to early indicators.
- Mainstream climate-change adaptation and mitigation into all relevant national policies.

**Those countries most responsible for causing climate change and most capable of assisting, particularly the USA, the European Union, Japan, Canada, and Australia must:**

- Take the lead by moving first, fastest, and furthest in reducing their greenhouse-gas emissions by at least 25 to 40 per cent from 1990 levels by 2020, and globally emissions must fall to at least 80 per cent below 1990 levels by 2050 in order to keep global warming less than 2°C above pre-industrial levels.
- Immediately start providing finance to developing countries that is sufficient, reliable, and additional to overseas development aid commitments to help East African countries take immediate action on adaptation.

**All governments and companies that pursue the production of biofuels must:**

- Follow clear pro-poor, environmental, and social objectives to ensure that pastoralists have control of the selection process for their own land that is put forward for biofuel production and that revenues accrue to them.

# 1 Pastoralism in East Africa's arid lands

## What is pastoralism?

*'Pastoralism is the finely-honed symbiotic relationship between local ecology, domesticated livestock and people in resource-scarce, climatically marginal and highly variable conditions. It represents a complex form of natural resource management, involving a continuous ecological balance between pastures, livestock and people.'*<sup>3</sup>

Pastoralist people are those whose way of life largely depends on mobile livestock-herding.<sup>4</sup> They live in a range of environments in many countries across every continent in the world. In sub-Saharan Africa mobile pastoralism is predominantly practised in arid and semi-arid lands (ASALs). These areas are hot and dry, with low and erratic rainfall. There are not many livelihoods that are suited to this arid environment but mobile livestock-keeping is particularly well adapted. In fact pastoralism in Africa evolved in response to climate variability over 6000 years ago<sup>5</sup> when the Sahara entered a period of prolonged desiccation. With no reliable supplies of permanent water, pastoralism enabled people to adapt to an increasingly arid and unpredictable environment by moving livestock according to the shifting availability of water and pasture.<sup>6</sup> This opportunistic management system continues to this day, making pastoralism an effective and efficient land use and production system for the drylands of the world.

To be practised effectively, pastoralism depends on freedom of movement for all herds between pastures and water sources; this is usually facilitated through some form of common-property regime. According to a UNDP report, where mobile livestock-production continues unhampered, it has helped in the conservation of biodiversity, improved livelihoods, and resulted in sustainable land management. Where it is constrained by land use or land tenure changes, sedentarisation<sup>7</sup>, and policy disincentives, it has led to serious overgrazing, land degradation, and poverty.<sup>8</sup>

Africa's rangelands have co-evolved with grazing and browsing herbivores to the extent that livestock are an integral part of the natural environment. Indeed this environment depends on herbivores to maintain its ecological balance. By grazing and trampling the pasture livestock can improve pasture health, transport seeds, and embed seeds into the earth. At the same time they provide

manure to help the seeds grow. Provided the livestock is managed effectively, and seasonal movements remain possible, grasslands thrive under pastoralist care.<sup>9</sup>

The dry and pastoral lands of East Africa occupy over 70 per cent of the Horn of Africa.<sup>10</sup> This ranges from 95 per cent of the total land area in Somalia and Djibouti, to more than 80 per cent in Kenya,<sup>11</sup> 60 per cent in Uganda,<sup>12</sup> and between 30–60 per cent in Tanzania.<sup>13</sup> Kenya is home to an estimated four million pastoralists, constituting more than ten per cent of the population.<sup>14</sup> In Uganda pastoralists constitute 22 per cent of the population, around 5.3 million people.<sup>15</sup> In Tanzania, it is estimated that the pastoral economy is the basis of the livelihood of almost four million people, which is ten per cent of the population.<sup>16</sup> As the most effective livelihood system in these drylands, pastoralism is clearly vital to the sustainable development of the bulk of the landmass of East Africa and to the well-being of millions of people who live there.

This paper draws specifically on the experiences of pastoralist communities in Kenya, Tanzania, and Uganda, while maintaining a broad regional focus.

## The value added by pastoralism

The World Initiative for Sustainable Pastoralism (WISP) divides the values to be gained from pastoralist systems into two categories. Direct values include products such as milk, fibre (wool), meat, and hides; and other values such as employment, transport, knowledge, and skills. Indirect values include the benefits of agricultural inputs such as manure, and products that complement pastoral production from rangelands including honey and medicinal plants. They also include services from good rangeland management like biodiversity conservation, and wildlife tourism.<sup>17</sup>

Vegetation in grazing lands supports many of the world's remaining large wild herbivores. The vegetation of the grasslands also prevents erosion and reduces dust levels that travel across continents.<sup>18</sup>

Although biodiversity is lower in grazing lands than in forests, as far as African plants are concerned, rainforests are only 14 per cent richer in species than savannas.<sup>19</sup>

Both direct and indirect values are apparent in pastoralist societies in Kenya, Tanzania, and Uganda. Pastoralists in the ASALs in Kenya supply the majority of the meat consumed in country. Livestock production – of which around 50 per cent nationally is concentrated in the ASALs – contributed ten per cent of Kenya's gross domestic product (GDP) in 2002 and 25 per cent in 2001.<sup>20</sup> The livestock sector

accounts for 90 per cent of employment and 95 per cent of household income in Kenya's ASALs.<sup>21</sup> The Kenyan Pastoralist Thematic Group estimates that pastoralism provides direct employment and livelihoods for over 3.5 million Kenyans.<sup>22</sup> Pastoralists are custodians of the dryland environments inhabited by Kenya's world-famous wildlife, areas that contribute to a tourist trade worth more than 50bn Kenyan shillings (approximately \$700m) every year.<sup>23</sup>

In Uganda, up to 80 per cent of the population derive their livelihoods from subsistence agriculture and livestock production, producing 85 per cent of the milk and 95 per cent of the beef consumed in the country.<sup>24</sup> Ugandan pastoralists hold 55 per cent of the national herd and provide meat, milk and milk products, hides, and skins to the local market and across the borders within the region and beyond.<sup>25</sup> Hides and skins are exported to Europe and Asia, earning the country up to \$10m in 2002.<sup>26</sup> The livestock sub-sector has continued to grow even as other sub-sectors, including agriculture, have declined.<sup>27</sup> Overall the livestock sector contributes 7.5 per cent of Uganda's GDP.<sup>28</sup>

Pastoralists in Tanzania dominate the livestock sector, owning approximately 99 per cent of the livestock, while the big ranches and dairy farms own a mere one per cent.<sup>29</sup> At an estimated 33.7 million, Tanzania is said to have the third largest herd of cattle in East Africa (after Sudan and Ethiopia).<sup>30</sup> The sector contributes 6.1 per cent to the national GDP.<sup>31</sup> Over the past decade there has been growth in the meat, milk, hides, and skins sectors. Total collection of hides and skins increased from about 1.3 million pieces in 1995 to 2.9 million pieces in 2004, of which 2.8 million were exported.<sup>32</sup>

The wildlife-based tourist industry in Ngorongoro and other areas that is such an important part of the national economy in Tanzania is estimated to be worth between \$900m and \$1.2bn annually.<sup>33</sup> Many pastoralists living in these areas support the existence of this tourist industry through their land-use systems. Tanzania has such a high density of wildlife species, both flora and fauna, that it has been classified as one of the 'Megadiversity Nations' along with the Democratic Republic of Congo, Indonesia, and Brazil.<sup>34</sup> It is this special biodiversity that draws thousands of tourists to Tanzania each year. According to a paper produced for the International Union for the Conservation of Nature (IUCN), biodiversity in Tanzania is not simply an endowment of nature, it is sustained by the land-use practices and cultural attitudes of the country's people as well as national and international conservation efforts.<sup>35</sup>

## Poverty in pastoral areas

Despite the suitability of mobile livestock-herding to the vast arid lands that cover East Africa, and the evidence of its productivity and value, many pastoralist people are among the poorest and most vulnerable in Africa. All too often the direct economic value generated by pastoralists is not retained in their communities, and the indirect value is un-rewarded and even unacknowledged by decision-makers.

In Kenya, pastoralist areas have the highest incidences of poverty and the least access to basic services of any in the country.<sup>36</sup> The highest poverty levels remain in the northern pastoralist districts, with huge proportions of the population falling below the national poverty line (Turkana 95 per cent, Marsabit 92 per cent, Mandera 89 per cent, Wajir 84 per cent), compared with a national average of 53 per cent.<sup>37</sup> More recent studies indicate that pastoralist wealth in the North-Eastern Province has declined by more than 50 per cent over the past ten years.<sup>38</sup> This same picture is reflected across the region.

In Tanzania there is a large concentration of pastoralists in the Ngorongoro Conservation Area. Illiteracy rates there of 75 per cent are among the highest in the country.<sup>39</sup> It is very difficult to get accurate recent data on poverty levels, but figures from the 1990s showed high numbers of people living below the poverty line.<sup>40</sup>

In Uganda the pastoralist areas are mainly in the north, which is also the poorest region in the country. Sixty-four per cent of the population live below the poverty line in northern Uganda, compared with 38 per cent nationally. Pastoralists living in northern Uganda have less access to schools and health care, higher rates of infant mortality, and lower levels of literacy than anywhere else in the country.<sup>41</sup>

These figures are not simply a reflection of the levels of wealth among pastoralists themselves. Pastoral areas are also home to a significant number of ex-pastoralists, i.e. those who are no longer able to make a living from pastoralism and have not managed to find an alternative livelihood. The numbers of ex-pastoralists worsens the overall poverty statistics for the entire pastoralist district.

Field data from Oxfam's programme in Turkana District in Kenya identifies some of the characteristics of these ex-pastoralist or destitute households. They are sedentary, settled either in small rural villages or larger towns. They survive on a combination of purchased food, food aid, wild-food gathering, fishing, begging for food or cash; and may have a small income earned through firewood- or charcoal-production and labour. Without any assets and little or no skills for

urban income-generation, these ex-pastoralists are extremely vulnerable to any changes in their external environment.<sup>42</sup>

It is clear that the value generated by pastoralist communities is not translating into prosperity, despite the suitability of pastoralism to its dryland environment. The question is, why is this so?

## **2 Challenges faced by pastoralist communities**

Pastoralist women and men face a series of challenges that hinder their way of life and stifle their ability to adapt to changes in their external environment. These challenges account for the poor human-development statistics in pastoral societies. They can be grouped into four main categories: climate change, political and economic marginalisation, inappropriate development policies, and increasing resource competition.

### **Climate change**

Communities across the world are starting to learn to live with the reality of climate change, adapting as best they can to its impacts. This is happening even though global average temperatures have not yet exceeded 1°C rise above pre-industrial levels. As temperatures rise further, risks will be magnified. A rise of 2°C above pre-industrial levels is now widely accepted as the threshold at which highly dangerous, and possibly dramatic and unpredictable, climate changes become much more likely. Global action is urgently needed to keep global temperature rise as far below 2°C as possible. Rich industrialised countries, which have both historic responsibility and the greatest capacity to act, must take the lead and cut their own emissions first and fastest.<sup>43</sup>

The pastoralists who inhabit the drylands of sub-Saharan Africa are among those who are living with the effects of climate change. Pastoralists have been managing climate variability<sup>44</sup> for millennia. However, the unprecedented rate and scale of human-induced climate change is beginning to pose more problems.

Scientific understanding of climate dynamics makes clear that in the short term (10–15 years) the climate variability that pastoralists have seen over the last few years will continue.<sup>45</sup> In Kenya, Tanzania, and Uganda the main climate-related vulnerabilities over recent decades have been:<sup>46</sup>

- **Successive poor rains:** Pastoralism is well adapted to coping with a single rain failure in a particular area, but when successive rainy seasons fail there is simply insufficient regeneration of grazing land, and pasture shrinks. Pastoralist communities from Kotido in north-eastern Uganda report that the long rains that used to occur between March - August are now beginning as late as May.<sup>47</sup>
- **Return rate of drought:** The frequent droughts in recent years have meant that households have had no opportunity to rebuild their assets, including livestock, with many becoming locked into a spiral of chronic food insecurity and poverty. Reports from the Kenya Food Security Group<sup>48</sup> and from pastoralist communities show that drought-related shocks used to occur every ten years, and they are now occurring every five years or less.<sup>49</sup> A pastoral association in Wajir District in Kenya reported that their animals don't have time to recover physically from drought and can no longer withstand the dry spells. Camels used to require watering only once every month, when the water points were hundreds of kilometres away, but these days they need it once every week. Cattle begin dying after just two months of a dry spell and are continuously being lost every dry period, whether there is a drought or not.<sup>50</sup>
- **Unpredictable and sometimes heavy rainfall events:** These make it difficult to plant and harvest crops (growing numbers of pastoralists plant crops opportunistically on a small scale) and sometimes are partly responsible for causing flash floods. Floods can damage both crops and infrastructure. They also result in a higher incidence of some human and animal diseases.

It is likely that over the next 15 years agricultural areas in Kenya and Uganda will continue to experience unpredictable rainfall, including both heavy rainfall events and the failure of rains and the loss of crops that comes with this.<sup>51</sup> In marginal agricultural areas pastoralism may in fact provide food resources and secure a viable livelihood where climate change and other pressures lead to lower reliability of farming.<sup>52</sup> Indeed, where climatic conditions become more variable without leading to the destruction of rangelands, pastoral livelihoods have the potential to sustain populations in the face of climate change where other livelihoods might fail.<sup>53</sup>

After the next 15 years the weather patterns will change again. Whereas global climate models have an impressive ability to simulate global climate, they are much less reliable at the scale of region or country. That said, climate models for East Africa show a greater consistency in their projections than is the case for almost anywhere else in the world. This gives a degree of confidence to the predicted

trends.<sup>54</sup> The Intergovernmental Panel on Climate Change (IPCC) climate models show:<sup>55</sup>

- **Increasing temperatures:** Most models and scenarios estimate that temperatures will be around 1°C higher by 2020 compared with the average temperature between 1961–1990. The increase will continue to around 1.5°C by 2050 and nearly 3°C by the 2080s.
- **Increasing rainfall:**
  - More rain is predicted to fall in the short rains (October–December) over much of Kenya and Uganda as soon as the 2020s, becoming more pronounced in the following decades. These rains are projected to increase by up to 60 per cent by 2050 and to have nearly doubled by the end of the century. The length of the rainy seasons is unlikely to increase, so short rains will be more intense, especially over northern and western Kenya, Uganda, and north-western Tanzania. Failure of the short rains may become less common, and years of heavy rain more common.<sup>56</sup> The increase is more modest for coastal Kenya and northern Tanzania, and southern Tanzania is predicted to become drier, with extreme dry years becoming increasingly common.<sup>57</sup>
  - Trends in the long rains (March–May) are less well understood but an increase seems likely, especially in western Kenya and north-western Tanzania.

Pastoralists in Uganda and most of Kenya could benefit in some respects from this predicted climate change. A substantial increase in rainfall will bring more dry-season pasture and longer access to wet-season pasture. A decrease in the frequency of droughts will mean grazing lands, livestock, and people have more time to recover between droughts and assets can be built up over time. More rainfall also means an increased likelihood of a good small-scale crop harvest.

However, there will also be significant negative consequences. In southern Tanzania, the combination of increasing temperature, decreasing rainfall, and extreme dry years becoming more common is likely to significantly increase water stress and drought for people and livestock. Throughout East Africa, increasing temperature is likely to cause heat stress to livestock (especially cattle – sheep and goats are less susceptible to heat stress). In Uganda and most of Kenya, increased rainfall may make more of the arid lands attractive to agriculture, and so agricultural encroachment, land speculation, and potentially conflict between pastoralists and agriculturalists may increase. The increased intensity of rainfall in these areas is likely to

mean that floods become more frequent, as some argue is already happening. Some human and livestock diseases are likely to become more common (e.g. Rift Valley Fever usually increases in the wet season).<sup>58</sup>

The strategies used by East African pastoralists to track climate variability in the past are now working less effectively. This is not only due to the onset of climate change and the new weather patterns that come with this, but also to the inability of pastoralists to implement their strategies for dealing with the changes,<sup>59</sup> which is caused by the following challenges.

## Political and economic marginalisation

Both prior to and post-independence pastoralists have been sidelined in decision-making processes in East Africa. The result is chronic under-investment in pastoralist communities across the region. The cause of this marginalisation is in part geographical. Pastoralist communities tend to be remote and highly mobile. Ethnicity is also another factor that has fuelled marginalisation. Most of the major pastoralist groups move across national boundaries: the Afar between Ethiopia, Eritrea, and Djibouti; Somalis between Ethiopia, Djibouti, Somaliland, Somalia, and Kenya; Borana between Ethiopia and Kenya; and the 'Karamoja cluster' between Kenya, Uganda, and Sudan.<sup>60</sup> These cross-border identities render pastoralists vulnerable in the political cultures of nation states. Pastoralists are sometimes believed by their fellow-nationals to have divided loyalties, and are highly vulnerable when such accusations suit other political interests.<sup>61</sup> However, perhaps the greatest source of pastoralist marginalisation is the outdated idea, which dominated much of the development thinking in the latter part of the twentieth century and in many areas continues today: that pastoralism is an outmoded way of life that needs replacing with 'modern' livelihood systems.

Governments in the region have historically had little economic and political interest in promoting pastoralists' interests, as they tend to see pastoralists as a 'minority vote' that isn't worth winning. In several East African countries pastoralists are relatively few in number and occupy what is considered by their governments to be marginal land with little economic potential. Even in countries where pastoralists are the majority such as Somalia and Somaliland, political power is concentrated in the hands of an elite who tend to use it to pursue their own short-term political and economic agenda rather than for the common good of the majority, which includes the pastoralists.<sup>62</sup>

Despite having some strong social institutions, in general the pastoralist areas are politically weak and disorganised, due to their social and economic marginalisation and governments' rejection or misunderstanding of their traditional systems of authority and leadership. Although pastoral civil-society groups are beginning to establish themselves across East Africa, they remain relatively weak. In many cases they are ill equipped to articulate and defend the interests of their members. These groups have difficulty in establishing a united front among themselves or forging strong institutional links with others, and they have limited financial resources and poor management skills. Furthermore, in many instances these groups have been set up by an urban elite that does not necessarily represent the interests of the broader pastoral community.<sup>63</sup>

All too often pastoralists are not aware of their rights and have no experience of accountable government. This has meant they have been unable to defend their traditional land rights and request the improved provision of basic services. Services like health and education are not adequately provided nor adapted to the population of the drylands of East Africa. Education is critical not only for improving the ability of pastoralists and ex-pastoralists to understand and speak out for their rights, but also for creating alternative opportunities for them to go on to further academic and vocational education and to take jobs in other sectors. Girls' education is particularly important to provide increased employment opportunities for women, and a reduction in childhood pregnancies. However, even standard models of service provision fall well short of what is required by the sedentary pastoral communities that exist, largely because services are located too far away from these remote communities to be useful. Mobile services and boarding schools are required to serve nomadic pastoralist communities, yet provision of such services is woefully inadequate.

Furthermore, there has been a severe lack of either public or private investment in infrastructure and economic development in arid areas, combined with poor access to markets. There are few opportunities for income diversification and this has led to the stagnation of incomes and to unemployment. The net effect is one of increasing insecurity, in which the more vulnerable people in society – pastoralist women in particular – are the greatest losers. Increasing numbers of men are seeking employment away from home in order to supplement progressively more fragile incomes. As a result, more responsibilities are falling on women, who are often unable to cope with the increased workload. In addition to their many domestic tasks such as caring for children and fetching water and firewood,

women now have to take on responsibility for herding and livestock rearing. In spite of their increased responsibilities, women still have less access than men to resources such as education, credit, and land.

The Jie community in Karamoja in north-east Uganda is experiencing exactly these problems. The district administration is unable to address the needs of the people as its allocation from the central government is low and its own revenue minimal. Food insecurity has increased, with communities dependent on relief food distribution since the 1980s. With the systematic reduction of livestock over the decades, the Jie have had to adapt to other livelihood strategies and many have become destitute. In the words of Sabina from the Panyanyara women's group, 'In the morning on the roads you find many people going into town from the villages as if they are going to work. But there is no work; they are just going to town to see whether they can get something to eat'. Both men and women provide firewood, charcoal, and bricks to urban dwellers, and engage in casual labour around the town so as to earn a meagre income. Child labour is extensive and young girls are sexually exploited in order to raise an income for their families, which increases their susceptibility to HIV infection.<sup>64</sup>

## Inappropriate development policies

For most of the twentieth century, rangeland management in Africa followed a model imported from the temperate grasslands of North America, where stable weather conditions prevail.<sup>65</sup> This promoted settling communities, with bore-hole drilling encouraging communities to cluster around water sources; and the assignment of fixed grazing lands to pastoralist communities, denying pastoralists their traditional land rights. But in Africa's drylands, where the harsh and variable climate causes great variations in pasture availability over time and space, the model caused overgrazing and land degradation (see Box 1). The spatial distribution of livestock must be managed, rather than their number, in order to avoid overgrazing in arid lands, thus highlighting the critical importance of mobility in dryland resource management.<sup>66</sup>

**Box 1: Wajir District: the consequences of constraining mobility<sup>67</sup>**

Wajir covers nearly 60,000 square kilometres of Kenya's arid North-Eastern Province. Its population is predominantly Somali, and is primarily engaged in nomadic pastoralism, herding combinations of cows, camels, sheep, and goats. Rainfall variability is high, and droughts are frequent. The process of limiting mobility and flexibility began in the colonial era, when ethnic groups were allocated fixed grazing areas. These prevented pastoralists from exploiting variable natural resources.

Both the colonial and the post-colonial governments pursued a highly technical ranching model in Wajir. New boreholes were drilled to service the grazing blocks, and these in turn led to the emergence of new settlements. More water points and settlements have a detrimental impact on pastoralists' ability to manage the natural resource base effectively, and therefore on their capacity to withstand drought. Traditionally, areas of dry-season and wet-season grazing in Wajir were distinct. During the dry season livestock were grazed close to permanent water points. When the rains came, they moved to fresh grazing in wet-season areas, where natural pans had by now filled, leaving dry-season pastures to recover. The dry-season grazing areas used to be less than 10km away. Areas of reserve grazing were also important fallback resources. But since the 1970s this pattern has broken down. With more water points, most areas of the district can now be accessed all year round. The areas grazed only in the wet season have reduced, leading to fewer areas of fresh pasture following the rains, while the areas grazed in the dry season get no chance to recover; drought reserve areas have all but disappeared. Today neither the dry- nor wet-season grazing areas exist, due to the proliferation of settlements. Wajir West, which used to be a wet-season grazing area, is now barren. The consequence of this is that livestock have to walk further distances (sometimes more than 30km) in search of water and pasture.<sup>68</sup>

As a result of this constrained mobility, pastoralists report an increase in stocking density, a reduction in palatable grass and browse, and a decline in milk production for all species. The consequence is that their ability to manage an uncertain environment, and therefore their resilience to drought, has decreased.

In Kenya, the majority of the government development funds have historically been allocated to so-called 'high-potential' predominantly agricultural areas of the country. These districts have received up to ten times the amounts allocated to the arid districts, because it was believed that they were more productive and that wealth would somehow 'trickle down' to the arid areas. This didn't happen.<sup>69</sup>

In Tanzania, the policy environment presents pastoralism as an economically non-viable activity. Furthermore, the nomadic nature of pastoralism is seen as a damaging characteristic that should be minimised through sedenterisation.<sup>70,71</sup> For example, the government's Rural Development Strategy of 2001 stated that, 'During the course of migration, pastoralists degrade land due to overgrazing, cause land conflicts and spread animal diseases'.<sup>72</sup>

While the government is currently actively promoting the revitalisation of the livestock sector, it isn't seeking to achieve this through the development of traditional extensive pastoralism. The ongoing development of the draft Livestock Policy by the Ministry of Livestock Development is almost certain to endorse freeing up land for major investment and ranching and re-emphasise the need for the 'traditional producers' to be transformed into a modern sub-sector. While mobile herding communities do need support to help them to meet the challenges of the twenty-first century, this does not mean abandoning traditional land-use strategies. Major investment in farming or ranching on fragile pastoral lands would lead to precisely the sort of environmental degradation of which pastoralist communities in Tanzania are wrongly accused.<sup>73</sup>

In Uganda, the attitude from the Head of State right down to district authority level is that the pastoralists need to settle and modernise. This has implications for pastoralists, particularly in the relatively peaceful south, many of whom have lost their land as a result of privatisation and enclosure by wealthy pastoral elites. The implications spread as displaced pastoralists move southwards into Tanzania, and north into other districts of Uganda, where they come into conflict with other pastoralists and cultivators.<sup>74</sup> At the local political level the Chief Administrator in Kotido District in Karamoja told a community group that was discussing climate change, 'If you settle down you will think of improving the environment instead of destroying it'. According to him the frequent movement of the Jie is the main cause of environmental destruction in Kotido.<sup>75</sup>

This attitude is further exemplified by the Ugandan government's approach to conflict management in Karamoja. Conflict here intensified after the ousting of Idi Amin in the 1970s when the Karimojong took up arms. The Ugandan government's ongoing military operations have led to extensive deforestation and restrictions on the mobility of pastoralists and their herds.<sup>76</sup> There is currently a Presidential directive in place that inhibits all movement of people and livestock. Through the military the government is forcing the Karamoja pastoralists into a sedentary way of life, supposedly for security reasons. However, this demonstrates a very narrow view of security and is undoubtedly driven by other factors including a desire to 'update' the pastoralist way of life.<sup>77</sup> These restrictions have meant the Jie's livestock have been unable to access pasture and water in their traditional dry-season grazing grounds, leading to pasture degradation, water depletion, and ultimately livestock death.<sup>78</sup>

Inappropriate land- and resource-use across East Africa has exacerbated some of the problems caused by climate change, and will

do so even more in years to come. Pasture that has been degraded through poor management is a major cause of flash floods following heavy rainfall events. If there is healthy pasture cover, heavy downpours tend to be absorbed by the land and pass down to the water table. If there is no pasture cover to absorb the extra rain, severe flash floods result and the water table is not replenished, which can in turn lead to drought.<sup>79</sup>

Pastoralists have survived until now without the support of appropriate development policies at the national level in Kenya, Uganda, and Tanzania, which is in itself a testament to their resilience. However, their livelihoods have been considerably weakened.

## Increasing resource competition

Over the past few decades greater pressure has been put on pastoralist grazing lands and water resources, as populations have increased and grazing land has been taken for cultivation, conservation areas, and state use. Pastoral livestock has been squeezed onto lands that are too small to be sustainable for pastoral production, as pastoralists rely on freedom of movement to be able to manage the rangelands effectively.

### **Agriculture**

The emergence of crops that can withstand drier conditions has increased competition from arable farming. In East Africa, arable farming now takes place in about 60–70 per cent of former forest, about 33 per cent of all woodlands and bushlands, 23 per cent of grasslands, and one – three per cent of deserts and semi-deserts.<sup>80</sup> Key resource areas, for example dry-season grazing lands, are a target for agricultural use because of their productive potential. Once pastoralists lose these key resource areas their whole strategy for dealing with drought is undermined.<sup>81</sup> At the household level, many pastoralists produce crops such as sorghum and millet on an opportunistic basis. Although this can provide additional income or food, this is often a risky strategy given the susceptibility of crops to rain failure. Small-scale farming can help pastoralists, but large-scale agriculture can be a threat.

### **Conservation**

Although there is evidence that rangeland conservation is entirely compatible with pastoralism, indeed that it is better served by allowing traditional patterns of pastoral movement than by promoting more sedentary lifestyles,<sup>82</sup> the creation of conservation areas has led to pastoralist land loss. In Tanzania, conservation areas

have led to more land being taken from pastoralists than all other factors put together. Ninety-five per cent of Monduli District, which is at the heart of Maasailand, has been set aside for conservation – even though more than one-third of protected areas in Tanzania have traditionally belonged to pastoralist communities.<sup>83</sup> Over the past half-century, Maasai pastoralists in Tanzania have been evicted from their lands in the name of conservation. Large-scale evictions occurred in the Serengeti in 1958/59, in Mkomazi in 1988, and in Ihefu in 2006.<sup>84</sup>

In Uganda there is a similar situation. Seventy per cent of the land in Karamoja has been allocated as hunting grounds or protected areas such as Kidepo National Park. Pastoralist communities are not secure in the land they inhabit.<sup>85</sup> Securing land rights for pastoralists in Tanzania and Uganda will be essential to their ability to maintain a sustainable livelihood.

### **Population growth**

The livestock population is not growing at the same rate as the human population. In fact, livestock numbers in East Africa have remained fairly constant over recent years because of disease epidemics and livestock starvation associated with floods and recurrent drought. The result is more people reliant on fewer livestock.<sup>86</sup> The Maasai people of the Ngorongoro conservation area in Tanzania are a case in point. In one decade from 1990 to 2000 the Maasai population grew at a rate of six per cent per annum from 23,000 people to 50,000. Livestock numbers during this period remained constant. As a result households started selling off female livestock to purchase food, thus depleting their core reproductive herds.<sup>87</sup> Increasingly, many pastoralists can no longer rely on livestock alone to provide them with a livelihood, yet other income-earning opportunities remain limited, as the growing number of destitute ex-pastoralists shows. The continuation of successful pastoral livelihoods, and therefore healthy rangelands and ecosystems, will depend on human and livestock numbers being commensurate. This means that some pastoralists will have to seek alternative livelihoods as population continues to grow.

### **Biofuels<sup>88</sup>**

There is another threat to pastoralist grazing land that has come about, in part, as a response to global climate change. Biofuels are increasingly seen as a clean energy alternative to fossil fuels. In January 2008, the European Commission published its legislative proposal for the Renewable Energy Directive, including a mandatory target that renewable sources, in practice biofuels, must provide ten per cent of member states' transport fuels by 2020. In a recent vote in

the European Parliament in July 2008 this was lowered to four per cent but at the time of writing this is not yet binding. This target is creating a scramble to supply in many developing countries, posing a serious threat to vulnerable people at risk from land-grabbing, exploitation, and deteriorating food security. Under the right conditions, of course, biofuels may offer important opportunities for poverty reduction – in particular when used to increase access to energy in marginalised areas, but more generally when land rights and human rights are respected during their production.<sup>89</sup>

Unfortunately such conditions, including national and corporate policies with clear pro-poor, environmental, and social objectives, are not evident in the emerging agro-industrial model of biofuel production. The clearance of critical ecosystems, such as rainforests, to make way for biofuel plantations, has rightly raised serious concerns from an environmental perspective. And the European Union has so far refused to include any requirements upon biofuel companies to respect land rights or human rights, despite planning to subsidise biofuels heavily on the premise that they are ‘sustainable’. Now, millions of people around the world face displacement from their land as the scramble to supply intensifies.<sup>90</sup> Rangelands are critical ecosystems and are home to millions of pastoralists. The increase in demand for biofuels is likely to increase pressure to expand the cultivation of dryland biofuels such as jatropha and red sorghum into areas traditionally used by pastoralists. In Tanzania, reports are already emerging that vulnerable groups are being forced aside to make way for biofuel plantations.<sup>91</sup>

However, this situation could be turned around. With fully recognised land rights and requirements on companies to seek their free, prior and informed consent before commencing projects, pastoralists should be able to identify areas for biofuel production so that key resource areas are not disturbed. They could lease sections of their land to production companies, if they so chose, so that revenues accrue to them. There may also be employment opportunities within the sector for some members of pastoralist communities. Furthermore, crop residues could be used by pastoralists as livestock feed. So far biofuel projects haven’t been implemented in this way. Unless pastoralists have secure land tenure, they are likely to miss the opportunities that biofuels could offer and succumb to the risks they pose.

### **Conflict**

Resource competition also significantly increases the risk of conflict between different groups of land users. This risk is greatest during times of stress, for example drought or floods, when available

resources are even more restricted. For example, during the 2005/6 drought, an incident in Turkana in Kenya reportedly left 40 people dead in a clash between Turkana and neighbouring Ethiopian pastoralists. There were also reports of fighting between communities seeking to access grazing land and water in the Kenyan pastoral areas between Isiolo and Wajir Districts. Community agreements governing access and the sharing of resources have been developed to prevent conflicts of this kind, but these have not been well disseminated. Conflict-mitigation institutions exist at local and national levels, with officers seconded to them from government, and there are also district peace committees. However, their effectiveness in practical early warning of conflicts and rapid response is hampered by a lack of funding and resources from government.<sup>92</sup> Climate change is likely to increase the drivers of conflict in many livelihood systems, including pastoral production. Governments need to invest in suitable systems and policies now to ensure that they can meet this challenge.

### **3 Addressing the challenge of climate change**

According to the International Institute for Environment and Development (IIED), the type of development that is pursued can either increase or diminish the vulnerability of communities to climate change: 'diversification of livelihood sources, improved infrastructure, education and institutional strength all help to reduce vulnerability to climate change as well as encouraging socio-economic development. In this respect, climate-change adaptation and development share many of the same goals to reduce social and environmental vulnerability'.<sup>93</sup> This applies perfectly to the pastoralist case.<sup>94</sup>

At the moment, years of political and economic marginalisation, inappropriate development policies, an increase in resource competition, an increase in abnormal climatic events, and a fundamental misunderstanding of their social and economic value has reduced the ability of some pastoralists to maintain a sustainable livelihood. Whether increasing climate change will see a worsening of this situation or whether pastoralists will be able to adapt and even take advantage of the opportunities it may bring will depend on how all these other challenges are tackled and the extent to which pastoralists themselves are involved in the process. The challenge of climate change is clearly tied up with all the other challenges that pastoralists face. So how should it be addressed?

## Through increased investment

The need for increased investment in appropriate development in arid lands is made more urgent by climate change, but even without this added threat it is essential to the sustainable development of the pastoral communities that live there. If pastoral communities are supported by the right kind of investment it is more likely that they will be able to cope with external shocks including climate change. This is the kind of modernisation that nomadic herding communities need. It is vital that investment plans have climate-change adaptation integrated into them. Both women's and men's needs and interests must be taken into account in these plans, recognising the essential non-marketed goods that women typically provide including water, fuel, food, and care.

### **What investment is needed?**

#### **Improved market access and opportunity**

Beyond the provision of basic services like health care and education, there must also be an injection of investment into the pastoral economy across East Africa. Improving market access for pastoral products and developing marketing opportunities are essential to the ability of pastoralists to get the best value for their products. According to a livestock-marketing survey carried out in Kajiado District in Kenya by a local non-government organisation (NGO), the Mainyoito Pastoralist Integrated Development Organization (MPIDO), the lack of timely and reliable market information is one of the biggest obstacles to profitable marketing of pastoralist livestock.<sup>95</sup> This is also the case in other districts in Kenya, Tanzania, and Uganda. MPIDO suggests that livestock-marketing information could easily be disseminated to producers via local FM radio. In Ngorongoro in Tanzania it is suggested that this information could also be shared within the villages via mobile phones.<sup>96</sup>

Investments to improve marketing opportunities for pastoralists include:<sup>97</sup>

- facilitating the provision of enterprise and business skills to pastoralist women and men to encourage initiatives like the establishment of dairy co-operatives, tanneries, and leatherwork businesses;
- improving livestock market infrastructure, auction system, cess collection and record keeping;
- encouraging alternative economic activity using other appropriate livestock products (e.g. dairy-product processing, milk, hides and skin, fat processing, bones, blood processing,

manure, horns) through awareness raising, skills transfer, training, capacity-building, and market linkages.

The Pastoralist Risk Management Project (PARIMA) collected data in the drought year of 2000 from four sites in southern Ethiopia and northern Kenya in order to examine how market access influences livestock marketing behaviour of pastoral households. The data confirmed that better market access was associated with higher rates of livestock sales and probably reduced losses during drought. Better market access also gave opportunities to re-stock when ecological conditions improved.<sup>98</sup>

### **Weather and insurance**

Improved and flood-proof communication networks and infrastructure will be key to the development of the pastoral economy, as will the provision of appropriate financial and technical services to pastoralists, for example micro-credit, insurance, veterinary care, and agricultural extension. Some experts believe that pastoralists would be better served if their business included a greater cash component (i.e. if they more routinely converted livestock to monetary assets). This would protect them against livestock losses during times of drought and would also speed up their ability to recover.<sup>99</sup> Governments should also explore public-private partnerships to include pastoralists in weather-risk insurance products to enable them to cope with the impact of droughts and floods. This is being pioneered for farming communities in Kenya and Ethiopia and could be extended to the ASAL areas.

Access to medium- to long-term weather forecast information should be useful for pastoral risk management since accurate predictions could help herders move stock in a timely fashion. A study carried out for PARIMA found that pastoralists move their herds based on scouting reports of realised rainfall and range conditions, not on the basis of forecasts.<sup>100</sup> However, this doesn't necessarily mean that climate forecast information, if made widely available, would not be useful for pastoralists in order to complement their traditional methods.

Drought and flood mitigation and preparedness will become more important in the future, and the systems to monitor and manage this will need to be strengthened further so that communities are able to cope with the impacts of climate change. An accurate early-warning system (EWS) is an essential part of effective drought and flood mitigation and preparedness. The EWS in operation in Kenya's ASALs is arguably one of the strongest in sub-Saharan Africa.<sup>101</sup> However, the critical failure in Kenya's system of drought management is that donors are slow to respond to early indicators.

The EWS is technically strong but early alerts do not lead to early action. It is widely agreed that a lack of rapidly deployable resources is the primary factor preventing effective drought and flood mitigation and preparedness. A national drought-contingency fund should be established to ensure timely, appropriate, and adequate intervention aimed at mitigating the impact of drought and flood-related crises.<sup>102</sup> This system should be replicated right across the region.

### **Cash transfers**

For those who are struggling and those no longer able to make a living from pastoralism, there must be a social welfare system in place. Cash payments in place of food aid would enable the members of pastoralist communities to meet their basic needs in terms of food, health care, and education. Cash transfers, when combined with other suitable interventions, have the potential to empower pastoralists and ex-pastoralists to make their own investment choices. For example, a household might choose between restocking themselves with livestock, investing in alternative livelihoods such as fishing, or experimenting with more cultivation.

### **Regional integration**

Governments in the East Africa region also need to join forces to address cross-border issues like conflict and migration, as well as opportunities for cross-border livestock marketing. Perhaps the most appropriate fora for negotiating the right mechanisms to find solutions to these issues are the East African Community and the Intergovernmental Authority on Development. Lessons can be learned from experience in West Africa where regional integration and cross-border livestock movement is easier.

### **Providing the investment**

After decades of neglect, the government of Kenya is tackling under-investment in its arid lands head on. The final draft of the government's National Policy for the Sustainable Development of the Arid and Semi-Arid Lands of Kenya was finalised in 2007, has been presented to the Cabinet, and is now awaiting debate in Parliament. The document was produced after extensive consultation between government, UN agencies, international NGOs, and Kenyan civil society, and it is widely believed that it is an effective policy for the development of the ASALs. The Kenyan government has also established the Northern Kenya Development Ministry with a specific focus on pastoral areas.

While Tanzania and Uganda are somewhat further behind Kenya with regards to positive policy-making that supports investment in

pastoralist areas, there has been some progress. In Tanzania, the National Strategy for Growth and Reduction of Poverty (NSGRP) promotes pastoralism as a sustainable livelihood, but the mechanisms for supporting pastoralism, if there are to be any, are as yet unclear.<sup>103</sup> Unfortunately, there are no specific pro-pastoralist policies in Uganda at present.

### **Funding the investment**

The threat of climate change should be a catalyst for providing these investments. Responsibility for funding this increase in investment in arid areas lies with both national governments and the international community. The Kenyan, Tanzanian, and Ugandan governments have all experienced high economic growth in recent years of 5.8 per cent, 6.8 per cent, and 6.6 per cent respectively in 2005, and 5.7 per cent, 5.9 per cent, and 5.3 per cent in 2006.<sup>104</sup> All three governments can afford to fund some of the much-needed investment.

The Kenyan government prioritised ASAL areas in the 2008/9 budget. It also established the Constituency Development Fund (CDF) in 2003. The CDF turned previously conventional development practice on its head by prioritising the poorest areas before high-potential areas. The main purpose of the fund is to ensure that a specific portion of the government's annual revenue is devoted to constituencies for the purposes of development, in particular in the fight against poverty at the constituency level.<sup>105</sup> Each constituency receives approximately 50m Kenyan shillings a year to be spent on identified community needs. District officials from Wajir in Kenya would like to see more of the money from this fund spent on environmental resource management in local communities.<sup>106</sup>

However, Kenya, Tanzania, Uganda, and in fact all countries in the region are developing countries or least-developed countries (LDCs), often with high recurrent costs that absorb much of their budget, including debt servicing (see Table 1).

**Table 1: Total debt, and debt as a percentage of the value of exports of goods, services, and income in Kenya, Uganda, and Tanzania<sup>107</sup>**

	Total debt in 2005 (\$bn)	% of value of export of goods, services, and income
Kenya	5.5	4.4
Uganda	4.3	4.3
Tanzania	6.2	9.2

If investment in arid areas is to be meaningful and successful in the long term, national governments have to be able to rely on long-term assistance from donors, as well as their own funds. This investment is a vital element in addressing the challenge of climate change and much of it could come from adaptation funding. Today's high-income countries – most responsible for the build-up of greenhouse-gas pollution over many decades<sup>108</sup> – have an obligation to help developing countries cope with the coming impacts of climate change. Oxfam estimates the cost of this adaptation to be at least \$50bn annually.<sup>109</sup> There is a window of opportunity now for high-income, high-emissions countries to provide finance to vulnerable countries and communities so that they can build their resilience and adaptive capacity before they face the full impacts of climate change.<sup>110</sup>

## Through improved representation

Pastoralists can and should play a role in shaping their own future. They must be empowered to influence policy and implementation at the national level. National and local government must proactively involve them in development initiatives including managing climate change and its impacts. Climate change makes hearing and understanding pastoralists all the more urgent. Furthermore, thousands of years of experience in dealing with climate variability inevitably means that pastoralists have a huge amount of useful knowledge to share with policy makers.

Empowerment is a two-way process involving civil society and communities building strong and representative pastoral organisations as well as government strengthening the accountability and responsiveness of its institutions to pastoralist needs.<sup>111</sup>

## Progress in Kenya, Tanzania, and Uganda

Kenya is taking a lead in East Africa, where many civil-society groups, research institutes, NGOs, and decision-makers see pastoralism as a viable livelihood for the future.<sup>112</sup> There are strong

village and district-level pastoral associations in Kenya with good links to national decision-making processes through their MPs.<sup>113</sup> Kenya has strong pastoralist representation in Parliament with a well-established Pastoral Parliamentary Group whose role is to provide a link between the government and pastoral communities. This shows that pastoralists are voting for people to speak out on their behalf. Pastoralists are at the centre of the Kenyan government's National Policy for the Sustainable Development of the Arid and Semi-Arid Lands of Kenya as key players in their own development. The policy acknowledges that this will require support for the development of local institutions and organisations, as well as improved local government and more decentralised planning.<sup>114</sup>

The Tanzanian government has set up a Department of Pastoral Systems Development that has been operating in the Ministry of Livestock Development and Fisheries for over two years. Several officials have attended a training course on pastoralism at the MS Training Centre for Development Cooperation.<sup>115</sup> However, with the current emphasis still on rapid development of the livestock sector through major investment in intensive, sedentary livestock systems, the power or the inclination of this department to promote extensive pastoralism as a sustainable and productive alternative is questionable.

Progress is minimal in Uganda where parish committees in Kotido District report that their views are rarely taken into consideration at the higher levels.<sup>116</sup> Pastoral Parliamentary Groups in Uganda and Tanzania do exist but have minimal impact on decision-making in Parliament.

### **New initiatives**

Mohamed Elmi, MP for Wajir District in Kenya, has a clear vision of how community decision-making can be communicated to national government. Mohammed Elmi wants to establish what he calls a constituency assembly in Wajir with his three fellow MPs, where the voices of the pastoral community are heard. Through the involvement of MPs and local people, this assembly should be able to bridge the gap between community and central government.

There is also a pioneering climate-change related initiative under way in Kenya and Mali, led by SOS Sahel, that aims to put local people in control of scenario planning for a variety of changes in their environment and society.<sup>117</sup> These include climate change but also population growth, technological change, the spread of education, the impact of external investment, etc. This pilot project will help to find out what pastoralists think about the future and help them communicate their ideas more effectively to those in power. Senior

people of pastoral origin are being trained on a range of scenarios relevant to their communities, and they then take this knowledge back to their constituencies, communicate it to other community elders, and together they plan for the future.<sup>118</sup> The project will also attempt to bridge 'external' and 'indigenous' forms of knowledge: for example, while pastoralists know perfectly well what is happening to their climate, they may not necessarily know what is causing these changes or what the future is likely to bring, nor what is happening to pastoral systems in other parts of the continent.<sup>119</sup> While it is too early in the life of the project to endorse it as a model for community-led development to be replicated in other countries, it seems to have made a positive start.

With regards to all these community-level initiatives, it is essential that pastoralist women as well as men are encouraged and supported to take part.

### **Land and resource rights**

Improved political representation for pastoralists should translate into a clear establishment of their rights. It is of paramount importance that pastoralists secure their land and resource rights with well-defined conditions relating to the quality of use and the provision of a legal framework through which land- and resource-use disputes can be resolved. Gender concerns must be taken into account to ensure that women are given equal rights over land and other critical resources. In addition, changes in land-use policies and planning across the region will be necessary to halt further encroachment by farmers and nature conservationists onto pastoral land.

## **Through adaptation**

Both an increase in investment in pastoralists and their communities and improved political representation are means of helping pastoralists to adapt to and cope with changes in their external environment, including climate change. Indeed, the whole approach to addressing the challenge of climate change could be seen as one of adaptation. This section focuses specifically on the kind of adaptive activities that pastoralists themselves undertake in order to deal with climate variability and climate change.

Communities must be at the heart of efforts to build their resilience to climate change because adaptation is inherently local. It will *only* work if local people are leading the process.<sup>120</sup> Traditional pastoral systems of resource management have always included a strong adaptive element. Pastoralists have long used traditional risk-

management systems in order to cope with drought and flood cycles. These include a range of livestock- and land-management strategies, alongside community support schemes. Pastoralists' experiences can offer lessons for national governments wishing to support adaptation activities.<sup>121</sup> Some examples follow.

### **Traditional risk-management systems**

- **Movement and migration:** Mobility is an inherent part of the pastoralist existence. Pastoralists move livestock depending on availability of rangeland resources including water and pasture. Research on pastoralist coping mechanisms in the Horn of Africa by the International Livestock Research Institute (ILRI) shows that the distance trekked to livestock water sources was almost tripled during drought.<sup>122</sup> Key resource areas that are set aside during the rainy season are also called upon during drought.
- **Herd management:** This covers various strategies including:
  - *Herd diversity* – Pastoralists manage both grazing and browsing livestock species to optimise different range resources and ensure the conservation of rangeland ecosystems.<sup>123</sup> East African pastoralists stock their herd with a mixture of cattle, camels, goats, and sheep.
  - *Maintenance of female-dominated herds* – A female-dominated herd structure is used to offset long calving intervals and thus stabilise milk production.<sup>124</sup>
  - *Herd size* – Building up the herd size in recovery periods between drought protects against total loss of the herd during drought.
  - *Herd splitting* – Splitting the herd into smaller groups and moving them to different areas is used to prevent over-grazing and maintain the long-term productivity of the range.<sup>125</sup>
- **Livestock feed supplementation:** The practice of supplementation of livestock grazing with other feeds is common during drought.<sup>126</sup> ILRI are investigating using improved fodder species to increase livestock strength and milk production, which would improve productivity and therefore resilience of both livestock and pastoralists during vulnerable periods like floods or drought.
- **Management of diseases:** Both human and livestock diseases can increase during periods of stress, particularly floods. Preventative measures include avoidance of areas known to be particularly susceptible to disease; migration; and hygienic practices.<sup>127</sup>

Controlled burning is used by pastoralists to reduce parasites destroy unpalatable grass species and shrubs and encourage the growth of favoured species.<sup>128</sup>

- **Sharing, loaning, and giving of livestock as gifts:** Sharing, loaning, and gift-giving among pastoralists are year-round activities, forming an integral part of the communal way of life. However, sharing of assets intensifies during and after drought when those families hit hardest run short of milk or meat for consumption.<sup>129</sup>
- **Collective action:** Labour sharing between pastoral families during periods of stress is a form of social safety-net that can carry vulnerable families through drought and flood events.

Communities are also trying different approaches to resource management as a specific response to recent environmental changes. Examples include:

- **Rain-water harvesting:** Communities in Wajir District in Kenya and in Kotido District in Uganda are exploring rain-water harvesting as an alternative to the exploitation of ground water, which is increasingly unreliable with a fluctuating water table. More rain-water harvesting should also help to control the proliferation of bore holes or shallow wells.<sup>130</sup>
- **Tree planting:** Although this isn't a new phenomenon, it is being undertaken in some arid areas in a much more comprehensive way. In Wajir District in Kenya the district government has mainstreamed environmental issues in their work plans. As one of his targets, the District Commissioner is now required to plant 1,000 trees each year and to ensure that deforestation is reduced by 70 per cent in the district. Schools throughout the district are being provided with drought-resistant Neem-tree seedlings for plantation. In Kotido District in Uganda the local council has recently passed by-laws that require every household to plant trees.<sup>131</sup>

These adaptive strategies work, and given the right support and an appropriate enabling environment they will continue to work as the climate continues to alter. Climate change is likely to continue to bring new weather patterns that pastoralists are unfamiliar with. However, provided their access to resources isn't restricted, it is likely that they will find an appropriate adaptive strategy to cope. If they are also supported by the kind of increased investment detailed in this paper they have every chance of successfully managing the challenge of climate change. Of course the search for improved adaptation strategies should continue. Exploring innovative

strategies to meet new challenges posed by climate change can build on existing traditions.

### **Diversification**

Adaptation also involves the movement of some people out of pastoralism and into other livelihoods. As much as pastoralism is in itself a viable economic activity, there is also a need to find ways of alleviating the growing population pressure on the land, as well as increasing the range of cash sources available to pastoralist families, many of whom currently rely on remittances sent from family members working elsewhere. There are already thousands of destitute ex-pastoralists who will need special support and attention to enable them to enter other livelihoods, through accessing their right to education, health care, and other services. Ex-pastoralists should benefit from increased investment in pastoral areas, but national governments urgently need to acknowledge and address the specific needs of this group in their development strategies, given that ex-pastoralists are unlikely to re-enter pastoral production.

Diversification is important given the stresses on pastoral communities and the growth in population, but there are risks. For example, although many pastoralists undertake some farming activities, diversification efforts need to ensure that the scope and space for mobile livestock-herding is not compromised. Pastoralists' needs are distinct from other farming groups and the potential returns from farming are limited. Research in East Africa shows that most diversification strategies in practice generate low incomes and actually can increase risk during periods of stress. The research concludes that herd mobility and herd diversification remain the major means of managing risk in pastoral areas, and efforts to encourage diversification should not impede these strategies. Nonetheless, when diversification is practised, investment in education for women and men is of paramount importance as it is the best way for pastoralists to achieve positive diversification through salaried employment.<sup>132</sup> Furthermore, when equipped with education and skills, ex-pastoralists have a role to play in integrating pastoralists with the wider economy, providing services for people and a market for pastoral goods.<sup>133</sup>

Diversification must be managed properly in order to ensure that women are not side-lined into low-income alternatives while men have access to more lucrative employment options. Where income diversification is pursued alongside pastoralism, women's main income-earning activities include milk sales, alcohol brewing, hay making, gum-arabica collection, and other forms of petty trade, while men frequently engage in livestock trading and other forms of waged

employment.<sup>134</sup> In Wajir District in Kenya and Kotido District in Uganda, women's groups have been improving their livelihoods by setting up small-scale businesses with assistance from NGO-led savings and credit schemes. Businesses include trading hides and skins, making shelter material, and selling milk.<sup>135</sup>

## Through mitigation

Stopping dangerous climate change is an urgent global priority. All countries, including developing countries, must devise low-carbon strategies for achieving sustainable development, finding ways that are more successful in reducing poverty than past or present models of growth.

Not only does pastoralism contribute little in the way of emissions but, when herds are effectively managed, it also provides a range of environmental services alongside livestock production including important services for the prevention of climate change such as reforestation and even potentially carbon sequestration. Traditional conservation practices include Akiriket in Karamoja District in Uganda. This is the custom of maintaining forests. It literally means 'untouched trees'. In Turkana District in Kenya, there has long been a practice of not cutting live or indigenous trees. In Shinyanga in Tanzania a process of reforestation has been under way since 1985 in agro-pastoral areas.

The value of forests (tropical in particular) as carbon sinks is now well recognised. But there is some scientific evidence that grasslands are just as important for sequestering carbon through storing it in their soils. Some scientists consider that well-managed tropical savannas in particular have the potential to store even more carbon than tropical forests,<sup>136</sup> although this is still hotly debated.

Of course there is a trade-off between the carbon absorbed by rangelands and the methane produced by cattle grazing on them. However, so long as humans keep cattle, generally speaking, extensive systems of livestock rearing, like pastoralism, are much more environmentally friendly than intensive systems,<sup>137</sup> which can destroy huge swathes of forest and emit large amounts of man-made greenhouse gases in their production systems.<sup>138</sup>

Pastoralists are entitled to be rewarded for all the environmental services they provide. In some cases they *are* rewarded. For example, the Maasai in Kenya are compensated by wildlife authorities for the corridors they provide through their land for game to pass through unharmed. In some areas they have been helped to gain directly from the tourist trade with support for the development of small-scale

business plans. However, there is not yet any financial reward scheme for all the environmental services offered by well-managed pastoralist grasslands.

At present avoided deforestation projects are not accepted for carbon credits within the Kyoto framework. The challenges of quantifying carbon sequestration and guaranteeing permanent carbon capture and social sustainability that plague the ongoing negotiation of credits for avoided deforestation under the post-2012 UN climate talks are even greater for rangelands.<sup>139</sup> Furthermore, carbon-credit schemes are controversial, even those used only in the voluntary market. It remains to be seen, therefore, whether carbon-offsetting can be applied to rangelands, and if it can, whether and how it could bring pastoralists any benefit. Whether or not reduced deforestation and degradation efforts are eventually allowed to offset carbon emissions elsewhere, it makes good sense for governments to encourage good rangeland management. Regeneration of degraded pastures increases their productivity as well as their carbon storage capacity and should be incentivised through financial rewards for pastoralists. Financial transfers from developed countries could potentially be used to pay pastoralists for the services they provide.

## 4 Recommendations

Climate change is by no means a death knell for pastoralism in the drylands of East Africa. In fact, if it comes down to the survival of the fittest, pastoralism could succeed where other less adaptable livelihood systems fail. Many members of pastoralist communities could have a sustainable and productive future in a world affected by climate change, given the right enabling environment. Pastoral production systems have to be secured and strengthened as the core use of the ASAL areas, alongside the creation of new and alternative livelihood opportunities. For this to happen, the following action is necessary.

### **National governments in East Africa must:**

- Recognise and protect pastoralists' land and resource rights, ensuring that women have equal rights to men, and recognising that pastoralism depends on freedom of movement for herds between pastures and water sources.
- Put an end to inappropriate development policies aimed at pastoralists, including encouraging settling communities through inappropriate bore-hole drilling and the assignment of fixed grazing lands to pastoralist communities.

- Empower pastoralist communities to influence policy and implementation at the national level, including the planning of climate-change adaptation strategies, through:
  - providing training and research opportunities for MPs from pastoral areas on climate change and other key issues relevant to their constituencies;
  - strengthening local government and institutions like pastoral associations, and facilitating decentralised planning and accountability mechanisms;
  - supporting community-level initiatives that are underway in Kenya such as constituency assemblies and community scenario planning and ensuring pastoralist women are equally involved;
  - supporting pastoralist community approaches to resource and risk management, backed up by the allocation of money from national funds like Kenya's Constituency Development Fund.
- Create positive diversification for pastoralists and alternative livelihoods for ex-pastoralists through investment in education for women and men as the best way to ensure salaried employment both outside of and complementary to pastoralism.
- Acknowledge and address the specific needs of ex-pastoralists in national and regional development strategies, given that this group is unlikely to re-enter pastoral production.
- Provide social welfare support to pastoralist communities in the form of cash payments in place of food aid, to enable the members of pastoralist communities to meet their basic needs in terms of food, health care, and education.
- Ensure that appropriate mechanisms are in place to manage conflict between pastoral groups and others, and enable practical early warning of conflicts and rapid response through the provision of adequate funding and resources. This should build on existing traditional conflict-resolution mechanisms.
- Negotiate appropriate mechanisms within the East African Community and the Intergovernmental Authority on Development to enable cross-border migration and conflict resolution, building on experience in West Africa.
- Work with the African Union to develop a pastoral policy framework to provide co-ordinated policies of the kind outlined in this paper, with a special emphasis on cross-border issues, including livestock movement, marketing, disease control,

conflict management, and freeing up cross-border trade in livestock products and commodities.

**National governments in East Africa, supported by climate-change adaptation funds provided by rich countries, must:**

- Invest more in appropriate development initiatives that have climate-change adaptation integrated into them in pastoralist areas, including:
  - basic services like health care and education through mobile schools and outreach clinics where appropriate;
  - effective, flood-proof transport and communication links;
  - financial and technical support services, including micro credit, weather risk insurance, and veterinary and agricultural extension services;
  - livestock marketing opportunities, including the dissemination of livestock marketing information and climate information through local radio stations and mobile phone networks; facilitating the provision of enterprise and business skills to women and men; improving livestock market infrastructure; and encouraging alternative economic activity using other appropriate livestock products e.g. animal hides, milk, wool etc.
  - ensuring both women's and men's needs and interests are taken into account in adaptation plans, especially recognising the essential non-marketed goods that women typically provide (water, fuel, food, and care).
- Reward pastoralists financially for all the environmental services they supply through well-managed pastoralist grasslands.
- Establish an accurate early warning system for droughts and floods, similar to that already in existence in Kenya, with international donors responding rapidly to early indicators. This includes setting up national drought contingency funds in order to ensure there is available finance for effective drought and flood mitigation and preparedness across the region.
- Mainstream climate-change adaptation and mitigation into all relevant national policies.

**Those countries most responsible for causing climate change and most capable of assisting, particularly the USA, the European Union, Japan, Canada, and Australia must:**

- Take the lead by moving first, fastest and furthest in reducing their greenhouse-gas emissions by at least 25 to 40 per cent from

1990s levels by 2020 and globally emissions must fall to at least 80 per cent below 1990 levels by 2050; in order to have a reasonable chance of keeping global warming below 2°C above pre-industrial levels.

- Immediately start providing more finance to developing countries that is sufficient, reliable and additional to overseas development aid commitments to help East African countries take immediate action on adaptation.

**All governments and companies that pursue the production of biofuels must:**

- Follow clear pro-poor, environmental, and social objectives to ensure that pastoralists have control of the selection process for their own land that is put forward for biofuel production and that revenues accrue to them.

## Notes

<sup>1</sup> In this paper the term mobile is used to refer to any form of livestock production involving the movement of livestock. The term therefore encompasses nomadic, transhumant and other forms of temporary relocation practised by pastoralists.

<sup>2</sup> Much of Eastern Africa experiences a bimodal rainfall pattern. The longer, main rainy season for much of the region occurs between March - May and the short rains typically occur between October – December annually.

<sup>3</sup> World Initiative for Sustainable Pastoralism (2007) 'Change of Wind or Wind of Change? Climate Change, Adaptation and Pastoralism'.

<sup>4</sup> Almost all pastoral communities practise some cultivation and other income generating activities in addition to herding. However, cultivation typically forms a smaller part of household food and income than livestock products. A widely used definition is that pastoralist households are those in which at least 50 per cent of household revenue comes from livestock or livestock-related activities. In contrast, agro-pastoralists derive more than 50 per cent of household gross revenue from farming and 10–50 per cent from livestock. J. Swift (1988) 'Major Issues in Pastoral Development with Special Emphasis on Selected African Countries', Rome: FAO.

<sup>5</sup> N. Brooks (2006) 'Climate Change and Pastoral Adaptation', [www.iucn.org/wisp/wisp-publications](http://www.iucn.org/wisp/wisp-publications)

<sup>6</sup> N. Brooks (2006) 'Climate Change, Drought and Pastoralism in the Sahel', discussion note for the World Initiative on Sustainable Pastoralism, [www.iucn.org/wisp/documents\\_english/climate\\_changes.pdf](http://www.iucn.org/wisp/documents_english/climate_changes.pdf)

<sup>7</sup> Sedenterisation is a term applied to the transition from nomadic to permanent, year-round settlement <http://en.wikipedia.org/wiki/Sedentarization>.

<sup>8</sup> M. Niamir-Fuller and C. Ponzinani (2004) 'BDP/EEG Human Development Viewpoint', UNDP.

<sup>9</sup> From a conversation between the author and Jonathan Davies of the World Initiative for Sustainable Pastoralism in Nairobi on 18 March 2008.

<sup>10</sup> Sudan, Eritrea, Djibouti, Somalia, Ethiopia, Uganda, Kenya, and Tanzania.

<sup>11</sup> Government of Kenya (2004) 'National Policy for the Sustainable Development of the Arid and Semi-Arid Lands of Kenya', fifth draft, May.

<sup>12</sup> World Initiative for Sustainable Pastoralism (2007) 'Pastoralism as Conservation in the Horn of Africa', WISP Policy Note No. 3, June.

<sup>13</sup> Department of Pastoral Systems Development, Government of Tanzania, [www.mifugo.go.tz/documents\\_storage/dpd.pdf](http://www.mifugo.go.tz/documents_storage/dpd.pdf)

<sup>14</sup> Pastoralist Thematic Group (2005) 'Poverty Reduction Strategy'.

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- <sup>15</sup> A. King (2000) 'Joint Donor Agencies Study on Performance of and Growth Prospects for Strategic Exports in Uganda: Annex to Case Study on Livestock and Livestock Products', Kampala: Delegation of the European Commission. The Ugandan population was 24.3 million in 2000 according to the World Bank Development Indicators, <http://web.worldbank.org/WBSITE/EXTERNAL/DATASTATISTICS/0,,contentMDK:20535285~menuPK:1192694~pagePK:64133150~piPK:64133175~theSitePK:239419,00.html>
- <sup>16</sup> N. F. Madulu and E. Liwenga (no date) 'Economics of Pastoralism in East Africa: Tanzania Component', unpublished report, RECONCILE/IIED. The Tanzanian population was 39.9 million in 2006 according to the World Bank Development Indicators, <http://web.worldbank.org/WBSITE/EXTERNAL/DATASTATISTICS/0,,contentMDK:20535285~menuPK:1192694~pagePK:64133150~piPK:64133175~theSitePK:239419,00.html>
- <sup>17</sup> World Initiative for Sustainable Pastoralism (2007) 'Squandered wealth: a global economic review of pastoralism', WISP Policy Note No. 2, February.
- <sup>18</sup> R. Reid, K. Galvin, and R. Kruska (2007) 'Fragmentation in Semi-arid and Arid Landscapes: Consequences for Human and Natural Systems'.
- <sup>19</sup> J.C. Menault (1983) 'The vegetation of African savannas', in F. Bourliere (ed.) *Tropical Savannas: Ecosystems of the World*, Amsterdam: Elsevier.
- <sup>20</sup> P. Simpkin (2004) 'Regional Livestock Survey in the Greater Horn of Africa', ICRC, p.31.
- <sup>21</sup> *Ibid.*
- <sup>22</sup> Pastoralist Thematic Group (2005), *op.cit.*
- <sup>23</sup> *Ibid.*
- <sup>24</sup> A. King (2000), *op.cit.*
- <sup>25</sup> World Initiative for Sustainable Pastoralism (2006) 'Review of the Literature on Pastoral Economics and Marketing, Kenya, Tanzania, Uganda and the Sudan'.
- <sup>26</sup> F.E. Muhereza (2003) 'An Analysis of Factors Affecting Livestock Market Access in Nakasongola, Kotido and Sembabule Districts: A Report to Oxfam GB', July.
- <sup>27</sup> World Initiative for Sustainable Pastoralism (2006), *op.cit.*
- <sup>28</sup> Uganda Investment Authority (2002) 'Investing in Uganda (Guide No. 5) – Livestock', Kampala: Uganda Investment Authority.
- <sup>29</sup> N.F. Madulu and E. Liwenga (no date), *op.cit.*
- <sup>30</sup> Joint Oxfam Livelihoods Initiative for Tanzania (JOLIT) (2006-2009) 'Pastoralism Strategy'.
- <sup>31</sup> United Republic of Tanzania, Ministry of Water and Livestock Development (2005) 'National Livestock Policy', final draft, April.

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<sup>32</sup> J. Letai and M. O. Neselle (2006) 'The Livestock Trade System in Tanzania', report for Tanzania Pastoralists and Hunter-Gatherer Organisation (TAPHGO), May.

<sup>33</sup> The Tanzania Development Partners Group states that 'the real contribution of the wildlife sector is estimated at between seven per cent to ten per cent of the Tanzanian GDP', [www.tzdac.or.tz](http://www.tzdac.or.tz). According to the World Bank Development Indicators, in 2006, Tanzania's GDP was \$12.8bn, <http://devdata.worldbank.org/external/CPProfile.asp?PTYPE=CP&CCODE=TZA>

<sup>34</sup> D.T.K. Shemwetta and J.R. Kidegesho (2000) 'Human–Wildlife Conflicts in Tanzania: What Research and Extension could offer to Conflict Resolution', Morogoro: Faculty of Forestry and Nature Conservation, SUA.

<sup>35</sup> W. Olenasha (2006) 'Conservation by Pastoralism and /or by Fortress: Policy Options for Sustainable Wildlife Conservation in Tanzania', produced for the IUCN.

<sup>36</sup> Pastoralist Thematic Group (2005), *op.cit.*

<sup>37</sup> Kenya National Bureau of Statistics (2007) 'Basic Report on Wellbeing based on the 2005/6 Kenya Integrated Household Budget Survey', April.

<sup>38</sup> Oxfam et al. (2005) 'Pastoralist Special Initiative Research Project', July.

<sup>39</sup> Oxfam Study of Adult and Youth Literacy in Ngorongoro (2005).

<sup>40</sup> The paucity of data from pastoral areas is a severe handicap to the implementation of appropriate policies and recognising the contribution of mobile livestock production to GDP. See WISP Policy Note No. 2, February 2007 and information on the Report on the Status of Pastoralism Project at [www.oxfam.org.uk](http://www.oxfam.org.uk).

<sup>41</sup> The Government of Uganda (2005–8) 'Poverty Eradication Action Plan'.

<sup>42</sup> R. Grahn (2007) 'Vulnerable Livelihoods Case Study Turkana District', Oxfam GB.

<sup>43</sup> This paragraph is taken from Oxfam (forthcoming) 'Climate Poverty: State of the Nation Report – Uganda'.

<sup>44</sup> Climate change means a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods (UNFCCC, Article One). Climate variability therefore means climate fluctuation within normal parameters.

<sup>45</sup> Climate models are unable to predict from about six months to 10–15 years in the future; therefore they provide no evidence that there will be a sharp change in the nature of East Africa's climate in the short term. As a result, predictions for this period have to be based on recent trends.

<sup>46</sup> 'Predominant livelihoods strategies pursued by households, 2003–05', from World Resources Institute et al. (2007) *Nature's Benefits in Kenya: An Atlas of Ecosystems and Human Well-Being*.

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<sup>47</sup> Extract from Kotido Case Study undertaken for this paper by Irene Karani, May 2008.

<sup>48</sup> A group made up of NGOs, UN agencies and representatives from Government Ministries. For more information go to <http://www.kenyafoodsecurity.org/inside.php?articleid=54>

<sup>49</sup> Republic of Kenya (2004) 'National Disaster Management Policy'; and rapid food-security assessments by the Kenya Food Security Steering Group.

<sup>50</sup> Extract from Wajir Case Study undertaken for this paper by Irene Karani, May 2008.

<sup>51</sup> 'Predominant livelihoods strategies pursued by households, 2003–05', *op.cit.*

<sup>52</sup> World Initiative for Sustainable Pastoralism (2007) 'Change of Wind or Wind of Change?', *op.cit.*

<sup>53</sup> *Ibid.*

<sup>54</sup> Predominant livelihoods strategies pursued by households, 2003–05', *op.cit.*

<sup>55</sup> J.H. Christensen, B. Hewitson, A. Busuioc, A. Chen, X. Gao, I. Held, R. Jones, R.K. Kolli, W.-T. Kwon, R. Laprise, V. Magaña Rueda, L. Mearns, C.G. Menéndez, J. Räisänen, A. Rinke, A. Sarr, and P. Whetton (2007) 'Regional Climate Projections', in: 'Climate Change: The Physical Science Basis', contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [A. Solomon, D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor, and H.L. Miller (eds.)]. Cambridge: Cambridge University Press.

<sup>56</sup> [http://www.knmi.nl/africa\\_scenarios/East\\_Africa/](http://www.knmi.nl/africa_scenarios/East_Africa/).

<sup>57</sup> *Ibid.*

<sup>58</sup> S. Jennings (2007) 'Vulnerability to Climate Change in Kenya: Implications for Oxfam GB', December.

<sup>59</sup> World Initiative for Sustainable Pastoralism (2007) 'Change of Wind or Wind of Change?', *op.cit.*

<sup>60</sup> J. Morton, J.K. Livingstone, and M. Mussa (2007) 'Legislators and Livestock: Pastoralist Parliamentary Groups and Ethiopia, Kenya and Uganda', International Institute for Environment and Development, Gatekeeper Series 131.

<sup>61</sup> *Ibid.*

<sup>62</sup> Information from John Letai, Oxfam GB Pastoral Programme, May 2008.

<sup>63</sup> *Ibid.*

<sup>64</sup> Extract from Kotido Case Study undertaken for this paper by Irene Karani, May 2008.

<sup>65</sup> I. Scoones (2007) 'Climate Change and the Challenge of Non-Equilibrium Thinking', contribution to WISP e-conference, February 2007.

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<sup>66</sup> *Ibid.*

<sup>67</sup> From I. Birch and R. Grahn (2004) 'Background Note on Pastoralism and Climate Change for the 2007 Human Development Report', April, based on R. Walker and H. Omar (2002) 'Pastoralists Under Pressure: The Politics of Sedentarisation and Marginalisation in Northeast Kenya', Nairobi: Oxfam GB.

<sup>68</sup> Extract from Wajir Case Study undertaken for this paper by Irene Karani, May 2008.

<sup>69</sup> Government of Kenya (2004), *op.cit.*

<sup>70</sup> Discouragement of nomadic lifestyle, development approaches which encourage cultivation, expansion of settlements (from <http://www.iss.co.za/pubs/Monographs/No95/Chap5.pdf>).

<sup>71</sup> Government of Tanzania (1995) 'National Land Policy'.

<sup>72</sup> W. Olenasha (2006) *op.cit.*

<sup>73</sup> Joint Oxfam Livelihoods Initiative for Tanzania (JOLIT) (2006–2009), *op.cit.*

<sup>74</sup> Information from Jonathan Davies of the World Initiative for Sustainable Pastoralism, May 2008.

<sup>75</sup> Extract from Kotido Case Study undertaken for this paper by Irene Karani, May 2008.

<sup>76</sup> *Ibid.*

<sup>77</sup> From a conversation between the author and Robert Ouma of the International Livestock Research Institute, 17 March 2008, Nairobi.

<sup>78</sup> Extract from Kotido Case Study undertaken for this paper by Irene Karani, May 2008.

<sup>79</sup> Input from Jonathan Davies of WISP, May 2008.

<sup>80</sup> R. Reid, K. Galvin, and R. Kruska (2007), *op.cit.*

<sup>81</sup> *Ibid.*

<sup>82</sup> R. Behnke, I. Scoones, and C. Kerven (1993) 'Range Ecology at Disequilibrium: New Models of Natural Variability and Pastoral Adaptation in African Savannas', London: Overseas Development Institute.

<sup>83</sup> W. Olenasha (2006) *op.cit.*

<sup>84</sup> *Ibid.*

<sup>85</sup> Extract from Kotido Case Study undertaken for this paper by Irene Karani, May 2008.

<sup>86</sup> K. Galvin, P. Thornton, R. Boone, and J. Sunderland (2004) 'Climate Variability and Impacts on East African Livestock Herders'.

<sup>87</sup> *Ibid.*

<sup>88</sup> The content of the box is from Oxfam (2007) 'Bio-fuelling Poverty: Why the EU Renewable-fuel Target May be Disastrous for Poor People', and a

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conversation between the author and Jonathan Davies of WISP in Nairobi on 18 March 2008.

<sup>89</sup> Oxfam (2008) "Another Inconvenient Truth: how biofuel policies are deepening poverty and accelerating climate change"

<sup>90</sup> From the UN Chair on Indigenous Issues, referenced in Oxfam (2008), *op. cit.*

<sup>91</sup> L. Cotula, N. Dyer, and S. Vermeulen, IIED (2007) "Fuelling Exclusion? The biofuels boom and poor people's access to land"

<sup>92</sup> This section is taken from the Oxfam (2006) 'Making the Case: A National Drought Contingency Fund for Kenya', May.

<sup>93</sup> S. Huq, H. Reid, and L.A. Murray (2006) 'Climate Change and Development Links', International Institute for Environment and Development, Gatekeeper Series 131.

<sup>94</sup> For more on this point, see World Resources Institute (2008) 'Weathering the Storm'.

<sup>95</sup> MPIDO (2007) 'Livestock Marketing Survey in Mosiro, North and Central Keekonyokie, locations of Ngong Division and Oldonyo Nyokie location of Magadi Division in Kajiado District', October.

<sup>96</sup> T. Amijee (2007) 'Assessment of Livestock and Livestock Products: Constraints, Opportunities, and Market Links in Northern Ngorongoro District Area', draft report for Oxfam GB, April.

<sup>97</sup> *Ibid.*

<sup>98</sup> J. McPeak (2001) 'Pastoralists' Use of Markets', Pastoral Risk Management Project, Cornell University.

<sup>99</sup> Idea from Jonathan Davies of WISP, May 2008.

<sup>100</sup> C. Barrett (2001) 'Climate Forecasting for Pastoralists?', Pastoral Risk Management Project, Cornell University.

<sup>101</sup> J. Nyangada, J. Swift, and M. Wekesa (2005) 'Feasibility Study for the Establishment of a National Drought Contingency Fund', submitted to the European Commission and the Government of Kenya, p.85.

<sup>102</sup> This section is taken from Oxfam (2006) 'Making the Case: A National Drought Contingency Fund for Kenya', May.

<sup>103</sup> W. Olenasha (2006) *op.cit.*

<sup>104</sup> From World Development Indicators online, *op.cit.*

<sup>105</sup> For more information see [www.information.go.ke/](http://www.information.go.ke/).

<sup>106</sup> Extract from Wajir Case Study undertaken for this paper by Irene Karani, May 2008.

<sup>107</sup> *Ibid.*

<sup>108</sup> The per capita greenhouse-gas emissions of Kenya, Tanzania, and Uganda are 2.0, 2.4, and 2.7 CO<sub>2</sub> equivalent respectively. Those of some of the richest nations, for example Australia, Canada, and the USA are 25.9,

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24.3, and 22.9 CO2 equivalent. Data originally from the World Resources Institute, found at [http://en.wikipedia.org/wiki/List\\_of\\_countries\\_by\\_greenhouse\\_gas\\_emissions\\_per\\_capita](http://en.wikipedia.org/wiki/List_of_countries_by_greenhouse_gas_emissions_per_capita)

<sup>109</sup> For more information see Oxfam (2007) 'Adapting to Climate Change: What's Needed in Poor Countries, and Who Should Pay', May.

<sup>110</sup> *Ibid.*

<sup>111</sup> Oxfam GB (2008) 'Drought-Cycle Management: A Rights-based Approach', Drought Cycle Management Brief 7, May.

<sup>112</sup> From a conversation between the author and Jonathan Davies of WISP in Nairobi on 18 March 2008.

<sup>113</sup> Extract from Wajir Case Study undertaken for this paper by Irene Karani, May 2008.

<sup>114</sup> From Oxfam (2006) 'Delivering the Agenda; Addressing Chronic Underdevelopment in Kenya's Arid Lands', May.

<sup>115</sup> Information from William Olenasha, Land and Pastoralism Programme Specialist, Joint Oxfam Livelihoods Initiatives for Tanzania.

<sup>116</sup> Extract from Kotido Case Study undertaken for this paper by Irene Karani, May 2008.

<sup>117</sup> For more information, see [www.sahel.org.uk](http://www.sahel.org.uk).

<sup>118</sup> I. Birch (2008) 'Update on visioning and scenario analysis with pastoralists', SOS Sahel, March.

<sup>119</sup> Information from an email exchange between the author and Izzy Birch, Programme Advisor, SOS Sahel International UK in May 2008.

<sup>120</sup> From Oxfam (2007) 'Adapting to Climate Change: What's Needed in Poor Countries, and Who Should Pay', May.

<sup>121</sup> S. Huq *et al.* (2006), *op.cit.*

<sup>122</sup> International Livestock Research Institute (ILRI) (2000) 'Coping mechanisms and their efficacy in disaster-prone pastoral systems of the Greater Horn of Africa'.

<sup>123</sup> WISP Policy Note No. 3, *op.cit.*

<sup>124</sup> ILRI (2000), *op.cit.*

<sup>125</sup> *Ibid.*

<sup>126</sup> *Ibid.*

<sup>127</sup> *Ibid.*

<sup>128</sup> WISP Policy Note No. 3, *op.cit.*

<sup>129</sup> ILRI (2000), *op.cit.*

<sup>130</sup> Extract from Wajir Case Study undertaken for this paper by Irene Karani, May 2008.

<sup>131</sup> *Ibid.*

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<sup>132</sup> *Ibid.*

<sup>133</sup> Input from Jonathan Davies of WISP, May 2008.

<sup>134</sup> P.D. Little (2001) 'Income Diversification among East African Pastoralists', Pastoral Risk Management Project, University of Kentucky.

<sup>135</sup> Extract from Wajir Case Study undertaken for this paper by Irene Karani, May 2008.

<sup>136</sup> IPCC (2000) *Land-use, Land-use change, and Forestry*, Intergovernmental Panel on Climate Change and Cambridge University Press.

<sup>137</sup> For more information on the environmental destruction caused by intensive livestock systems see the Food and Agriculture Organisation's briefing paper, 'Livestock's Long Shadow', [www.fao.org/ag/magazine/0612sp1.htm](http://www.fao.org/ag/magazine/0612sp1.htm).

<sup>138</sup> From a conversation between the author and Jonathan Davies of WISP in Nairobi on 18 March 2008.

<sup>139</sup> From a conversation between the author and James Wakaba of Energy for Sustainable Development Africa in Nairobi on 19 March 2008.

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For further information on the issues raised in this paper please e-mail [advocacy@oxfaminternational.org](mailto:advocacy@oxfaminternational.org).

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\*Freelance policy and advocacy consultant and lead author

\*\*Oxfam GB Regional Programme Development Manager and co-author

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<p><b>Oxfam GB</b> Oxfam House, John Smith Drive, Cowley, Oxford, OX4 2JY, UK Tel: +44 1865 473727 E-mail: <a href="mailto:enquiries@oxfam.org.uk">enquiries@oxfam.org.uk</a> <a href="http://www.oxfam.org.uk">www.oxfam.org.uk</a></p>	

**Oxfam International Secretariat:** Suite 20, 266 Banbury Road, Oxford, OX2 7DL, UK  
Tel: +44 1865 339100 Email: [information@oxfaminternational.org](mailto:information@oxfaminternational.org) Web site: [www.oxfam.org](http://www.oxfam.org)

**Oxfam International advocacy offices:**

E-mail: [advocacy@oxfaminternational.org](mailto:advocacy@oxfaminternational.org)

**Washington:** 1100 15th St., NW, Ste. 600, Washington, DC 20005-1759, USA

Tel: +1 202 496 1170.

**Brussels:** Rue Philippe le Bon 15, 1000 Brussels, Belgium

Tel: +322 502 1941

**Geneva:** 15 rue des Savoises, 1205 Geneva, Switzerland

Tel: +41 22 321 2371.

**New York:** 355 Lexington Avenue, 3rd Floor, New York, NY 10017, USA

Tel: +1 212 687 2091.

**Linked Oxfam organizations.** The following organizations are linked to Oxfam International:

**Oxfam Japan** Maruko bldg. 2F, 1-20-6, Higashi-Ueno, Taito-ku, Tokyo 110-0015, Japan

Tel: + 81 3 3834 1556. E-mail: [info@oxfam.jp](mailto:info@oxfam.jp) Web site: [www.oxfam.jp](http://www.oxfam.jp)  
**Oxfam Trust in India** B - 121, Second Floor, Malviya Nagar, New Delhi, 1100-17, India  
Tel: + 91 11 2667 3 763. E-mail: [info@oxfamint.org.in](mailto:info@oxfamint.org.in) Web site: [www.oxfamint.org.in](http://www.oxfamint.org.in)  
**Oxfam International and Ucodep Campaign Office**  
Via Masaccio, 6/A 52100 Arezzo, Italy  
Tel +39 0575 907826, Fax +39 0575 909819  
email: [ucodep-oi@oxfaminternational.org](mailto:ucodep-oi@oxfaminternational.org)

**Oxfam observer member.** The following organization is currently an observer member of Oxfam International, working towards possible full affiliation:  
**Fundación Rostros y Voces (México)** Alabama 105, Colonia Napoles, Delegacion Benito Juarez, C.P. 03810 Mexico, D.F.  
Tel: + 52 5687 3002 / 5687 3203 Fax: +52 5687 3002 ext. 103  
E-mail: [comunicación@rostrosyvoces.org](mailto:comunicación@rostrosyvoces.org)  
Web site: [www.rostrosyvoces.org](http://www.rostrosyvoces.org)