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Pastoral land rights, livelihoods and adaptation to climate change

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In the past few decades, the loss in access to land for pastoralists has been greater than for almost any other resource users, seriously compromising their livelihood options.

Bruce H. Moore, Director ILC

Foreword

This publication brings together the inputs made by over 120 participants in a web-based forum organised in 2006 and managed by the **International Land Coalition** (www.landcoalition.org) on *Pastoral Land Rights*.[1] The paper has been further enriched with material from a number of projects from around the world and the results of another web-based forum organised by the **World Initiative for Sustainable Pastoralism** (www.iucn.org/Wisp) in 2007, focusing on *Climate change, adaptation and pastoralism*.[2] The primary author of this paper mediated both web-based conferences.

Climate change leading to rising temperatures and increasing rainfall variability will affect different regions and people in different ways. The implications of climate change for pastoral livelihoods are not yet fully understood. Two opinions prevail. Some see pastoral groups as the '*canaries in the coalmine*' in the sense that that they will be the first to lose their livelihoods as rangelands and water points dry out. Others argue that pastoralists are the best equipped to adapt to climate change, as pastoral livelihood strategies are honed to respond to scarce and variable natural resources and cope with difficult and uncertain agro-ecological conditions. In this scenario, climate change could result in an extension of territories where pastoralism could show comparative advantages.

Enhancing and securing pastoralists' access to strategic resources is essential if they are to respond effectively to the effects of climate change. Yet, as most contributors agree, these capacities have been eroded as a result of their historical and social marginalisation. Today, pastoralists' vulnerability is thus more a consequence of this marginalisation than climate change per se, although the former will clearly exacerbate the latter.

1. The ILC working paper *Mobile livelihoods, patchy resources & shifting rights: approaching pastoral territories* is available at www.landcoalition.org/pdf/ev06_pastoralists.pdf
2. The WISP working paper *Change of Wind or Wind of Change? Climate change, adaptation and pastoralism* is available at www.iucn.org/wisp/documents_english/WISP_CCAP_final_en.pdf

1. Introduction

Pastoralism is a complex livelihood system seeking to maintain an optimal balance between pastures, livestock and people in uncertain and variable environments. Pastoral groups typically inhabit areas where scarce resources and extreme climatic conditions limit options for alternative land use and livelihood systems. The highly variable and unpredictable nature of these environments results in similar livelihood strategies being practiced by different pastoral communities in very different environments, from the drylands of Africa to the cold plateaus of central Asia and the frozen steppe of northern Europe and Canada.

Despite the important role pastoralism plays in supporting local livelihoods, in contributing to national and regional economies in some of the world's poorest countries, and in providing diverse ecological services, its capacity to adapt to change is facing many challenges, including those posed by climate change.

According to the Intergovernmental Panel on Climate Change (IPCC, 2007), if trends in greenhouse gas emissions are not fundamentally altered, global temperatures will rise by between 1.4° and 5.8° C by 2100. Rising temperatures will bring about changes that are as yet not fully understood. Long-term impacts are difficult to predict and are bound to vary from one region to another in the world – such as the predicted increased aridity in the Kalahari and increased rainfall in the Sahel.[3] Such changes will affect different people in different ways. Medium and long-term effects may also vary. For example, while the Sahel may become greener in the medium term, the area may become increasingly dry and arid in the longer term. While more needs to be understood about the likely trajectories of climatic change and its associated impact on the environment in different parts of the world, this paper will focus on the main factors that will make herding communities most likely to gain or lose from these challenges.

As is so often the case in regions of ecological, economic and political uncertainty, the *accessibility* of the resource is more of a determining factor than its availability or variability. In particular, the vulnerability that is associated with climate change in pastoral environments originates in the limitations imposed on pastoral coping and development strategies, especially their ability to move and to access critical resources in different territories.

Another common feature of pastoral areas in the world is the high rate of development intervention failure, often due to misconceptions by decision-makers and planners of local resource management and livelihood systems. These failures have led to the definition of a set of new paradigms and innovative approaches. Pastoral resource management is increasingly acknowledged as sustainable (indeed one of the most sustainable in most arid and semi-arid lands, and especially under increasing climatic variability). Many observers now appreciate the rights of herding communities to land

3. Contribution from Daniel McGahey, Oxford University Centre for the Environment, UK.

as a primary element for appropriate pastoral development and rangeland management. Nonetheless, despite increasing awareness of the sustainability of pastoralism and in some countries institutional reform in support of pastoral mobility (e.g. the pastoral laws in Mauritania and Mali), globally governments still have a very negative perception of mobile pastoral systems. In this context, climate change may offer a new framework with which to approach pastoralism, and to take stock of its capacities for production on marginal and unpredictable lands, in an environmentally sustainable manner.

This paper presents a brief overview of pastoral systems, analyses the rationale behind mobility as a strategy to cope with scarce and variable resource endowment, and finally addresses the rights concerning the access to and the control of resources in the context of climate change. The historical and geographical dimensions of the debate are illustrated by examples from various pastoral areas in the world. Recommendations for appropriate policy options and development initiatives for pastoral areas considering the challenges of climate change are provided in the final section.

2. Global pastoralism

Extensive pastoral production is practised on 25% of the global land area, from the drylands of Africa (66% of the total continent land area) and the Arabian Peninsula, to the highlands of Asia and Latin America. It provides 10% of the world's meat production, and supports some 200 million pastoral households who raise nearly 1 billion head of camel, cattle and smaller livestock, about a third of which are found in sub-Saharan Africa[4], where it accounts for about 20% of national GDPs.[5] Apart from African regions, an increased and renewed interest in pastoral production systems is reported in the Mediterranean, western and central Asian regions.[6] Pastoralists have an intimate and rich knowledge of complex ecosystem dynamics making them one of the best detectors of environmental change.

With a few notable exceptions (e.g. Somalia and Mongolia), pastoralists are usually a minority in their countries occupying marginal land along national borders, and ruled by a political elite often representing an agricultural majority who live in higher rainfall zones. In many respects pastoralists have suffered disproportionately from the colonial partition of the continents. Many national boundaries, often drawn in straight lines, pass right through pastoral areas effectively splitting the same community across two or more countries. This is the case of the Saharawi and the Touareg in the Sahara, the Fulani in the Sahel, the Bedouin and the Kurds in the near East, the Somalis, the Borana, the Afar in the Horn of Africa and the Karamoja cluster.

This splitting of pastoral territories has carried significant jurisdictional and political implications. Inter-state disputes often involve pastoral lands because of their location on the frontier location. This has led to political manipulation and the militarisation of pastoral communities often with devastating consequences on local livelihoods. Transboundary movement of livestock and herders are among the first activities to be restricted when tensions arise between two countries, such as cases along the India-Pakistani and the Ethiopian-Eritrean borders attest.[7] The same applies to conflict-related refugee movements, which often move through, settle in and make intense use of contested rangelands. The Ogaden and the Darfur wars are vivid examples in this respect. The case of the Palestinian Bedouins chased off the pastoral resources of the Jordan Valley represents a perfect case showing how a combination of conflicting geo-political interests has inexorably driven herders off their lands.[8]

4. FAO, 2001; Global statistics need nevertheless careful handling and sceptical reasoning, as pointed out by Dobie (2001).
5. Alive, 2006.
6. As an example in case livestock sector contributes 32% GDP of the GDP of Mongolia, and 32% of its export value.
7. It is reported that in the latest confrontation with Ethiopian army and militia, about 70% of the Eritrean national herd was raided, at the expense of bordering pastoral groups (DFID, 2000).
8. Contribution from Issa El Shatleh, Palestinian Farmers Union, Palestine.

3. Patchy resources

Range resources are heterogeneous and dispersed (patchy), tied with seasonal rainfall patterns (temporary), differing through time (variable) and characterised by overall erratic climatic patterns (unpredictable). The net productivity of arid rangelands is low and the animal and plant populations that it can sustain fluctuate unpredictably, depending on a number of variables among which rainfall patterns play a major role. Similar dynamics characterise highland ranges – Central Asia and South America _ where low temperatures and prolonged snowfalls, have a marked impact on land use.

A study by the World Initiative for Sustainable Pastoralism (WISP)[9] provides an analysis of the important rainfall variations that have characterised the Sahelian region in recent decades, with related land use implications. Scientific predictions and computer simulations suggest that in the short term the Sahel might actually benefit from climate change, through a greening of the Sahel and southern Sahara. However, given our knowledge of long-term global and regional climate change and the driving factors behind such change it is possible that any greening of the Sahel and Sahara in the near future may eventually be reversed, if not this century then at some time in the (possibly distant) future. In East Africa, climate analyses suggest that some parts of the region will become drier, with considerable reduction in the length of the growing season, whilst other areas, including southern Kenya and northern Tanzania, may become wetter, with increases in the length of the growing season. In Southern Africa, there are predictions of a collapse of vegetation in the Kalahari region, which will have dire consequences for Botswana's and Namibia's significant pastoral population. Overall, these processes will be accompanied by increased variability of weather, especially of precipitation, which seems to characterise climate change on a global scale.

In general, most climate change models predict an increase of extreme events associated with increased irregularity and decreased predictability. Overall major effects could be classified as (Nori and Davies, 2007):

- Changing rainfall patterns, with increased variability expected and declining water balances.
- Biodiversity shifts in both time and space.
- Changes in wind patterns.
- More frequent floods and droughts.
- Changes in oscillations of recurrent events such as El Niño, heat waves and tropical cyclones.

In such a scenario, ensuring that pastoral communities have access to different ecozones at different times is critical. Pastoral herds can exist for much of the year on arid lands so long as they have secure access to water and higher value forage (such

9. www.iucn.org/wisp/documents_english/WISP_CCAP_final_en.pdf

as browse) during the dry season, and the ability to move to wet season pastures during the rains and access salty soils and medicinal plants at certain times of the year. In more temperate environments, the seasonal movements between summer highland and winter lowland pastures play a similar role. Secure access to drought refuge areas is also essential (e.g. forest areas, swamp lands) while forest resources such as fuel wood and wild fruits also complement dietary and income-generating patterns. The interdependence of arid lands with other ecosystems (such as forests or wetlands) thus creates opportunities for resource extraction across several different and complementary ecological niches.

A key benefit of pastoral production systems is their capacity to establish and develop reciprocal and interdependent relations with neighbouring sedentary communities (farmers, urban dwellers, etc.). Pastoralists and their neighbours benefit from complementary production systems, which usually grants favourable terms of trade to both parties. Pastoralist livelihoods are thus integrated into the wider social economy, with accessibility to market routes and urban areas becoming of critical relevance to herding economies.

4. Mobile livelihoods

Mobility provides the best strategy to manage low net productivity, unpredictability and risk on arid and semi-arid lands. Seasonal movements are essential for pastoralists to tackle marked spatial and temporal variations in livestock grazing resources while enabling pasture restoration at certain times of the year. Mobility can be vertical, linking highland with lowland areas for winter, spring and summer grazing, and horizontal, through different zones such as the north-south transhumant movements in the Sahel. A distinction can also be made between regular movements and emergency movements during critical times, due to drought, conflict or other reasons. Patterns of mobility range from long distance, often cyclical movements covering hundreds of kilometres through various forms of transhumance (set migratory routes on seasonal basis) each demanding different involvement of household and herd members. In the Maghreb alone, more than a dozen systems of pastoral land use are reported.[10]

Mobility is an ecological and economic necessity. Apart from allowing the best use of range resources, it is also a way to avoid disease vectors in some areas (e.g. tsetse flies), to enhance exchanges with other land users (crop residues against animal manure), to access different market opportunities (e.g. to sell dairy surpluses or to purchase staples or animal drugs) as well as to join with kin for a seasonal festivity, acquire or share information, search for complementary sources of livelihood.

Apart from the availability of natural resources, mobility also critically hinges upon technical and socio-political factors. This includes human capital (in-depth knowledge of complex rangeland agro-ecological dynamics) and social capitals (social norms, duties and responsibilities instrumental to negotiate resource access and manage disputes through the principle of reciprocity[11]). Mobility is not just about herds moving to varied grazing areas; it is also about managing the varied grazing areas so that herds can move.[12] Mechanisms regulating access to resources must therefore be flexible enough to provide space for the necessary negotiations and arrangements that accommodates for different and often overlapping rights a) related to different user groups and b) over different resources, the relevance of which might change through seasons.

10. Bourbouze, 1999.
11. *Reciprocity* is the medium through which interdependence among individuals and groups is established and maintained so to spur informal negotiation rather than war and mechanisms exist as well as incentives not to violate rules (e.g. revenge) (Niamir-Fuller, 1999).
12. Roe, *et al.*, 2003.

5. Negotiated rights

The dynamics of rangeland ecology have defined the pastoral tenure and land use regimes regulating access to and control over resources in pastoral territories. In most pastoral areas differing categories of rights over resources coexist ranging from those that are more private within the communal system (such as family dug or clan managed dry season wells), to those that are more communal in nature such as access to dry season forests or grazing around a water point. Wet season pastures and water tend to be managed under controlled open access systems.[13] Negotiated and reciprocal access to resources are features underpinning tenure systems to enable different groups to track and exploit unpredictable short-term fluctuations in feed or water supply in an opportunistic manner, while applying a longer term strategy that maintains environmental reproduction and viable socio-political relationships.[14] Pastoralists seek to ensure access to specific resources at different times of the year, rather than invest in costly control mechanisms over sporadically productive areas of land.

Pastoral land tenure systems and institutions have been modified as a result of the encroachment of outsiders' interests, as well as ideologies. In many countries this has resulted in "legal pluralism" composed of a set of over-lapping regulations and cultural norms managed by different institutions ranging from formal statutory bodies to informal customary institutions, to religious dictates (e.g. the Sharia influences in most Muslim countries). In some countries geo-political dynamics (e.g. land policies developed under the Western or Soviet models) and varying degrees of integration within the wider global frame (e.g. the growing market integration of pastoral economies and increasing competition on their resources) have further influenced tenure regimes.

13. Ensminger, 1996:130.
14. Behnke, 1994; Niamir-Fuller, 1999; Leach *et al.*, 1996b.

6. Invisible hands, visible grabs

Governments and other actors external to pastoral system have persistently failed to understand the underlying rationale and dynamics of pastoralism.[15] Colonial governments perceived pastoral lands to be unoccupied (having no owner) or under utilised and poorly managed thereby justified their appropriation by the State and classified as government or Crown property. This approach meant that grazing lands and migratory corridors could be alienated without consulting, or even informing, local communities.

Garret Hardin's '*tragedy of the commons*' thesis in 1968 provided a convenient theoretical framework to justify existing perceptions of pastoralists as irrational land use managers by those external to the system (governments, academics, developers). Although Hardin's theory mislabelled pastoral resource tenure as open access and failed to recognise the critical role of customary institutions in regulating the management of common pool resources, it was extremely influential in perpetuating negative myths of pastoralism being responsible for overstocking, desertification and insecurity. Pastoralism was widely seen as economically inefficient, ecologically dysfunctional and socially backward.[16] Extreme drought events in the Sahel and the Horn of Africa during the 1970s and 1980s and increasing conflictive trends in pastoral regions further supported this vision.

Pastoral mobility and communal resource tenure regimes were considered the major obstacles to pastoralists' socio-economic development; hampering options for private investment and sustainable resource management.[17] Building on western land management models (such as the ranching model), pastoral development policy and practice focused on two major aspects: 1) sedentarisation of pastoral communities through agricultural pilot projects, primary service provision or forced settlement programmes and 2) relocation of rangeland tenure rights through nationalisation and/or privatisation schemes. These policies largely failed as illustrated by the experiences of Botswana[18] and Kenya where privatisation of rangelands and the development of commercial livestock rearing favoured a small, commercial elite at the expense of the broader community. Similar failures have been recorded with projects aimed at producing crops on higher potential areas, such as cotton state farms in the Lower Awash valley in Ethiopia or dry cereal farming expansion in the marginal areas bordering the Fertile Crescent, with important implications for the livelihoods of local herding communities.[19]

As pastoralism was perceived as intrinsically self-destructive,[20] colonial and independent governments systematically alienated pastoral communities from the management of their resources thereby weakening the basis of traditional pastoral livelihood systems

15. Lane, 1998.
16. Swift, 1996; 2004. Hagmann, 2006.
17. Rwabahungu, 2001.
18. Contribution from M. Taylor, Botswana.
19. Sen, 1981; Nori, forthcoming on drought vulnerability in the Maghreb and Mashreq region.
20. Anderson 1999.

Box 1. Cycles of reform on the Tibetan plateau

The institutional environment of Tibetan herders offers an eloquent example of how policy trends can adversely affect pastoral societies. Traditional Tibetan land tenure and herd management systems were placed under siege in the 1950s when Mao Zedong's army entered the country and subjected it to Chinese rule. The Collectivisation period (*Gonshe*) that followed provoked great changes to Tibetan herder societies because while land management had traditionally been communal, livestock were in fact household property. In the early 1980s, as part of the loosening of the communist economy, herds were decollectivised under the Household Responsibility System, making them individual property once more. Ten years later, seasonal grazing lands were also reallocated on individual basis, once again throwing pastoral systems into turmoil.

Source: Nori, 2004.

leading to profound changes in power and control structures. Faced with growing external interference and a rising competition on strategic resources within the rangelands, pastoral societies became gradually less able to retain control over resources[21] and their livelihoods increasingly vulnerable to climate vagaries.

Box 2. Ending the *Contrôle Bedouin* in the Syrian *Badia*

During their initial colonisation, the French Mandate power in the Syrian *Badia* has established the *Contrôle Bedouin*, a special administrative unit to support traditional Bedouin institutions to autonomously operate law and conflict resolution. This entity was dismissed with the discovery of oil in the region, as the French became concerned with protecting a potentially important investment. Control over the area was accomplished largely through grants of private ownership of vast swathes of the common tribal grazing areas of the *Badia*, voting rights in Parliament, privileged access to foreign education for the sons of Bedouin leaders, and significant monetary compensation. Much of the tribal leadership was co-opted into the elite urban political scene. Land holdings once held in common were increasingly registered in the names of tribal leaders and converted into farms.

Source: Chatty, 2006.

Although colonial governments initiated the first policies resulting in the alienation of pastoral land, they continued to be replicated by post-colonial governments. Most post-colonial constitutions specifically refer to sedentarisation as the way to develop pastoral areas.[22] '*If the colonisers were guilty of ignoring customary rights generally, the indigenous African officialdom is similarly guilty of ignoring pastoral tenure with the same air of prejudice, indifference, ethnic chauvinism and discrimination*'.[23] Internal boundaries within now-independent states applied the same '*divide et impera*' rule. This resulted in pastoral lands, formerly under the management of a particular clan or group, being divided amongst different administrative units. In addition, the management of these administrative units was entrusted to other groups, severely disrupting mobility patterns, resource access and conflict, as cases in Maghreb and southern Asia attest.

In the Middle East, the twentieth century ruling elite and the urban middle class have appropriated the vision of British and French Mandate officials, adapting it to the nationalist credo, often declaring nomadic pastoralism as a backward way of life antithetical to social and national development.[24] Neither the Soviet nor the Chinese

21. Swift, 1994; Lane & Moorehead, 1994; Lane, 1998.
22. Refer to Markakis, 2004.
23. Tenga, 2004.
24. Mundy and Musallam 2000, quoted in Chatelard, 2003.

experiences escaped this fate, as their development policies (from intensive farming to industrial developments) were deeply embedded in Western paradigms. Soviet states sought to monopolise and control the extensive ranges that characterise central Asia. With the breakdown of the Union the system was rapidly liberalised into individual tenure within a market framework. A similar fate is occurring to pastoral territories under Chinese control.

Indeed, both government ownership and privatisation of lands have demonstrated poor effectiveness in pastoral areas. In his satellite imagery assessments of grassland degradation under different property regimes in parts of central Asia crossed by international boundaries, including northern China, Mongolia and southern Siberia, Sneath (1998) revealed large differences in degradation processes under different resource access right patterns. Grazing resources in Mongolia – which has allowed pastoralists to continue their traditional group-property institutions, involving large scale movements between seasonal pastures – were much less degraded than those administered through Russian and Chinese policies, involving state-owned agricultural collectives and permanent settlements.[25] The problem of land titling playing the 'Trojan Horse' within pastoral livelihoods is also affecting Latin American herding communities.[26]

Box 3. No tragedy of the commons in highland Bolivia

Until the 1970s, rights to pasture in highland Bolivia were corporately held by large clusters of communities traditionally known as *ayllus* with strict rules of entry and resource management. The Bolivian agricultural reform that followed the nationalist revolution of the 1950s was the last in a series of blows to highland pastoral community structure. One of main goals of the reform was to provide peasants with individual title to land, a policy that herders had opposed for decades. Their advocacy to maintain corporate tenure of pastures was invariably seen by the government as an irrational resistance to modernisation, or a stubborn attachment to 'primitive' and 'dysfunctional' ways of life. As a result of these policies, in the 1970s herders and the state finally compromised by subdividing the *ayllus* into smaller units (hamlets comprising a group of families), each of which received a land title. Within this structure, the basic laws of indigenous pastoral production remain what they have always been. Land tenure, rules of entry to social groupings, collaborative practices, customary laws, residence patterns are all regulated to ensure that the balance is kept between demographic constraints and the distribution of scarce resources. Culture as such is not so much at stake in the Aymara herders' desire to preserve corporate land tenure as is the need to protect the only instruments that made pastoral production a relevant investment in the harsh mountain environment.

Source: Swift, 2004.

25. Ostrom *et al*., 1999:278.
26. Contribution of G. Palmili, Argentina.

In different countries, the state played a major role expropriating pastoral land either through nationalisation or by indirectly supporting the interests of non-pastoral actors and groups through policies favouring settled farmers, urban consumers or market entrepreneurs. The focus of privatisation schemes in many cases became an opportunity for land speculation by a limited number of wealthy citizens at the expense of poor rural dwellers who gained their livelihoods from the ability to access such common resources.

The growing inability of government to manage effectively the lands and resources it nationalised is rendering them effectively *free access areas*, and increasing the likelihood of violent disputes. Experiences in the Middle East Badia or in Mongolia's Gobi demonstrate that land degradation and social unrest in pastoral regions is more often the result of modernising policies and interventions that have weakened locally-tailored institutions regulating resource access and utilisation, than customary pastoral management systems. *Hastily adopted and implemented policies that ignored traditional tenure rights without providing effective alternatives led to encroachment of other uses on rangelands, increased grazing pressure, accelerated misuse of resources and ultimately land degradation.*[27]

Box 4. UN approach to rangelands

It took many decades for the International Community to readdress its understanding of pastoralism and to acknowledge the capacity of local communities to effectively manage marginal lands. The evolution of the United Nations' vision towards pastoralists and rangelands represents a clear example with this respect. The first Convention on Desertification (UN COD, Nairobi 1977) identified in pastoral land use the main cause of environmental degradation for marginal lands. This position was reiterated in the UNEP 1984 Governing Council. It was only during the 1990s that the United Nations Conference on Environment and Development (UN CED) legitimised the relevance of local communities' knowledge, rights and capacities towards what had been defined as 'sustainable development'. Agenda 21 strongly advocated a combination of government decentralisation, devolution and community participation for communally managed natural resources. In 1994 the UN Convention to Combat Desertification (UNCCD) placed a major emphasis on improving the livelihoods of drylands inhabitants as a main measure to achieve its goal,[28] but the provisions of the Convention remained weak as to matters concerning access to land.[29] Recent efforts through the UN-supported WISP programme have been aimed at further challenging this critical policy domain.

27. FAO, 1994.
28. Swift 1996; Leach *et al*., 1996a.
29. Drylands Coordination Group Report No. 4.

7. Under pressure

Archaeological evidence suggests that pastoralism in Africa developed in direct response to previous cycles of long-term climate change and variability and spread throughout northern Africa as a means of coping with an increasingly unpredictable and arid climate.[30] As highlighted by some contributors to the WISP e-conference, pastoralists' vulnerability to climatic variations as less a consequence of shifting rainfall patterns, than their inability to adapt to the changes due to inappropriate policy hampering livestock mobility and their capacity to access critical livelihood resources, to trade across borders, to benefit from appropriate investments, and to participate in relevant policy decision-making. A similar view was expressed at the Alive-LEAD conference.[31]

Today pastoral communities are increasingly drawn into a globalising world which offers both opportunities and challenges, and which may affect their capacity to respond to climate change. Some of these key trends include:

- the potential opportunities of expanding trade in livestock at regional and global levels as a result of increasing demand for animal proteins all over the world;[32]
- the promise of greater autonomy and participation in decision-making offered by recent reforms towards decentralisation, devolution and local participation;
- the potential benefits that technological developments can bring in areas such as telecommunications, animal health care and crop resistance to arid conditions;
- the potential impact of the West's 'war on terror' disproportionately focused on pastoral lands in Afghanistan, Somalia, Maghreb, Middle East and the Saharan zones of Africa, which will negatively affect pastoral livelihoods and regional stability, security and geopolitical interests.

Population growth combined with a diminishing land and resource base is a major challenge. Population growth in pastoral growth is estimated to be 2.8%. This means that population levels will double every 25 years and treble in 40 years. Pastoralism is particularly sensitive to population growth since the technical possibilities of increasing the productivity of the rangeland on a sustainable basis are limited, especially when compared to yield increases obtainable by technical advances in crop production.[33] Livelihood diversification is thus critical to to lessen human pressures on the rangelands.[34] The higher levels of population growth in non-pastoral areas compared to pastoral areas brings additional challenges to those who exit pastoralism in search of alternative livelihoods.

30. Brooks, 2006, paper commissioned by WISP.
31. Alive LEAD keynote Session 1 ALIVE-LEAD "Pastoral livelihoods between aid dependence and self-reliant drought management".
32. Delgado (1999) defines it as the 'Livestock Revolution'.
33. Contribution of S. Sandford, England.
34. Also refer to Breman and de Wit, 1993, for the sub-Saharan Africa region.

Changing social and economic relations in pastoral societies also play a determining role in the capacity of families to adapt and respond to climate change. **Economic differentiation** is changing the manner in which livestock, land and other natural resources are being managed in pastoral areas around the world, which in turn is damaging the capacity of pastoral communities to adapt and respond to climate change. As absentee owners increasingly rear livestock for commercial purposes and as these actors increasingly enclose water points and pastures for their private use, so access to critical dry season resources become increasingly difficult for pastoral communities. It is reported that absentee livestock owners are estimated to own 50 percent of the Sahelian livestock herd.[35] Furthermore, patterns of economic differentiation are likely to further disrupt traditional social networks, risk sharing and safety nets mechanisms, which characterise pastoral livelihoods and play a critical role in helping these communities respond to climate variability. **Gender and generational relationships** are also changing within pastoral societies. As reported from regions as diverse as Uganda and Somalia to India and Argentina, women are increasingly playing a more important role in decision-making outside of family affairs.[36] This not only relates to their traditional roles within the household or as peacemakers between groups, but also to new roles as economic and political agents.[37] Youth, often caught between high employment rates and few options for alternative livelihoods, are challenging traditional power structures and at times resorting to the use of weapons and violence. Commercial raiding, banditry and enrolment in insurgent movements are often seen by young men as the means to achieve economic independence and social recognition.[38]

The mix of growing population, shrinking lands and climate change are likely to provoke and aggravate **conflict over resource access, control and utilisation**. While increasing competition over a increasingly scare and/or variable resources is likely to trigger conflict, other factors such as poor governance and the inability of pastoral communities to negotiate access to key resources will also play a role. In this sense the weakening of customary institutions has undermined their authority to sanction abuses and violence within local societies, making conflict less manageable. Once more, misguided 'development' paradigms have exacerbated the problem rather than helped to solve it.

35. Fafchamps *et al*., 1996, quoted in Alive 2006.
36. Contribution from G. Palmili, Argentina.
37. Pointing, 1995; also refer to the EC-funded Milking Drylands research programme.
38. Nori, 2005.

8. Losing winners

There are five key controversial issues needing to be addressed by national policies and international development assistance, with respect to pastoral development in a context of climate change.

1. Adaptation to change is central to the concept of sustainable livelihoods. Pastoralism is a livelihood system highly adapted to cope with environments characterised by ecological scarcity and climatic unpredictability. In the context of climate change, where resources will become increasingly variable without necessarily leading to the collapse of rangelands, mobile livestock keeping is the best way to diminish risk. Yet, pastoralism has yet to gain wide recognition by policy makers as a viable system with the potential to sustain livelihoods and contribute to national, regional and global economies from environments that otherwise are unsuited to alternative land use systems, particularly in a context of climate change.

2. Pastoralists, who have been accused for decades of triggering environmental degradation, are being now recognised as good custodians of variable environments, and the positive environmental externalities of well-managed rangelands are now largely acknowledged.[39] Rangelands have the highest potential of any terrestrial ecosystem to sequester carbon and pastoral management of these areas directly influences this. Paradoxically, those who are now amongst the most exposed to climate change are the least responsible for it.

3. Many areas inhabited and exploited by pastoralists have rich underground resources, such as fossil fuels. The utilisation of such resources would further contribute to the global increase in carbon dioxide concentrations, while most likely worsening the livelihoods of local communities. Past experience shows that pastoralists generally do not benefit from the economic wealth generated by the exploitation of these resources; rather they shoulder the costs in terms of associated conflict and insecurity, as examples in central Africa and central Asia demonstrate (e.g. the exhaustive war in south Sudan).

4. Despite a rich body of research demonstrating the rationale and effectiveness of pastoralism in managing resources in harsh and uncertain environments, it has yet to trigger appropriate changes in government opinion and policy directives. Yet pastoralism has much to offer in the current debates on how best to adapt to climate change where concepts such as variability, resilience, risk management, etc. are given increasing prominence.

5. A last bitter consideration is that herders' rights and capacities to provide valuable services in a sustainable manner from uncertain environments are getting recognised at a time when public investment in pastoral areas is consistently decreasing.

39. Lane, 1998.

Low population density, remoteness and political marginality make pastoral areas the prime targets for state retrenchment under Structural Adjustment Programs and cuts to public budgets. The outcomes of decentralisation and devolution processes are yet to prove beneficial to pastoral communities, whose sense of disillusionment and resentment towards state or regional institutions is an important element that should not go underestimated and that might help explaining to an extent processes of political radicalisation in many pastoral regions.

Climate change and the anticipated changes in resources availability it will engender could provide a positive context for adopting new assistance paradigms in pastoral regions. However, if positive benefits are to be realised, development assistance must address the political roots of pastoral marginalisation. Rather than invest in costly technical solutions, it would be more effective to strengthen pastoralists' capacity to claim their rights so as to cope with growing climatic variability.[40] As Scoones' put it; *as climate change involves higher degrees of uncertainty, rather than struggling to achieve certainty in an uncertain world, perhaps the best response it to embrace the consequences of uncertainty and rethink responses accordingly.*[41]

40. Main conclusion from the Wisp Climate Change e-forum.
41. Contribution from Ian Scoones, IDS, UK to the Climate change e-forum.

9. Conclusions

Pastoral systems are important to global society. They support the livelihoods of millions of people living in harsh and uncertain environments where alternative land use systems are highly risky. Livestock reared in pastoral systems also contribute significantly to national and regional economies and provide important environmental services such as carbon sequestration, fire prevention, and biodiversity conservation.

Pastoral societies and people all over the world are experiencing processes that are redefining their territories and reshaping their resource utilisation patterns. Integration of pastoral economies into markets, changing migratory patterns and political processes of regional integration and decentralisation all carry threats and opportunities. Climate change is another variable, but one that could either be the "straw that breaks the camel's back" or "spark of a new area".

Pastoralists' vulnerability to climatic variability is less a function of declining resources than a result of their increasingly inability to respond to such changes by practicing livestock mobility, trading across borders, benefiting from social services adapted to their life styles and participating in relevant policy decision-making processes. Social, political and economic marginalisation is thus the keyword that explains pastoralists' current inability to deal with and adapt to changes, including environmental ones.

Climate change is also having an indirect impact on systems of interdependence and resource exchange between pastoral and other livelihood systems. Whereas in the past there was in certain areas a degree of livelihood specialisation, increasingly this is no longer the case. In some regions the distinction between pastoral and farming livelihoods is increasingly blurred. Pastoralists are increasingly adopting cultivation to compensate for livestock losses while many farmers are investing in pastoralism in response to higher variability and uncertainty. The merging of these livelihood systems has weakened former relations of interdependence between groups, and heightened competition for access to natural resources between them. This process of diversification represents a major adaptation not exclusively to climate change but to economic pressures as well as policy influences.

Moreover as climate change further increases the risk of producing cereals in marginal lands, pastoralists may be in a position to reclaim these areas as appears to be the case in some countries of Maghreb and Mashreq[42] as well as in other regions. On the other hand, shifts in policies that support agricultural production – such as decreasing subsidies to producers, or incentives for bio fuel production – might lead to increases in the prices of staples, with negative feedback on pastoralists. These increases in cereal prices might contribute to eroding the terms of trade between animal proteins and cereals. This represents an issue of particular concern for pastoralists, as the economic

42. Refer to the ICARDA Maghreb and Mashreq program, phase III.

competitiveness of their products vis-à-vis other food staples is the main reason behind growing population density on marginal lands.[43]

There are also implications for the sustainability of urban environments under changing climatic conditions. As experience attests, urban environments represent important complementary environments to pastoral areas, through close economic and social relationships and exchanges. Too little or too much rainfall will affect urban infrastructure that are designed for specific ecological conditions, with overall consequences of herders' capacities to profit from urban-related income-generation opportunities.[44]

The threat of climate change to pastoral livelihoods is not so much changing agro-ecological conditions, but rather the diminishing capacity of pastoralists to put their adaptive capacities properly to work. Climate change is a process that most pastoralists should be able to cope with, provided political and economic factors define an enabling framework that reverses current trends where pastoralists seemingly have a decreasing access to increasingly limited resources.[45]

Enhancing pastoralist entitlement to a wider range of resources, agro-ecological as well as socio-economic, and enabling them to use such resources as needed, is thus vital to reducing their vulnerability and to enhance sustainable development of marginal lands. Efforts in this direction must be supported by richer countries, which bear the main responsibility for climate change, although caution should be raised over the ways these resources would be allocated and utilised.

43. Helland, 2000; Dietz *et al*., 2001.
44. Refer to Delgado *et al.*, 1999.
45. Main conclusion from the Wisp Climate Change e-forum.

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We welcome contributions to the Drylands *Issue Paper* series from all our readers.

Content

The *Issue Papers*, published together with the *Haramata* bulletin, are designed to help you share your research results, practical development experience or conceptual ideas on specific issues of relevance to drylands development. Although most of our readers are based in Africa, we also welcome papers from other dryland areas. All *Issue Papers* are published in both English and French so as to encourage the exchange of information between researchers and development practitioners in French and English speaking countries.

Issue Papers are not academic publications, but they should present information based on either research or practical experience, and be written in a manner that will be accessible to a non-specialised readership.

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Issue Papers must be short, easy to read and well structured.

- Use short sentences and paragraphs.
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- Use the active voice.
- Use a variety of presentation approaches (text, tables, boxes, figures, photographs).
- Length: maximum 7,000 words (including annexes if any).

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Please send an electronic version of your paper in either English or French in Word format, or a hard copy if you do not have access to email. An editorial committee will then review your paper. They will assess its relevance for drylands development and send you written comments including ideas on what changes need to be made for the paper to be accepted for publication. Any subsequent editorial changes will be made in consultation with you. Once your paper has been accepted, it will be translated into the other language (i.e. either English or French) and we will send a copy of the translation for you to check if you wish.

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Papers or correspondence should be addressed to:

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Promoting better and more sustainable livelihoods for people in Africa's drylands – that is the objective of IIED's Drylands Programme.

Our priorities are:

- to strengthen the capacity of local people to manage their resources sustainably and equitably;
- to promote policies and institutions that enable participation and subsidiarity in decision-making;
- to influence global processes that further the development needs of dryland peoples.

In partnership with African and European organisations, we carry out research and foster informed debate on key policy issues of direct concern to poor people's livelihoods. Our work covers a broad variety of fields, ranging from land tenure and equitable resource access to the future of family farming in a globalised world; from pastoral development and the management of the commons to managing transnational resources; from good governance and social inclusion to rural-urban links; from literacy and democratic participation to regional integration, and international migration.

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