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The Tragedy Is On, The Tragedy Is Over: Pastoral Challenges and Opportunities for Conservation Agriculture

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Theme: Innovations for improving efficiency, equity and environment

ABSTRACT

Drylands traditionally represent harsh environments where production without harming the underpinning ecosystem processes has proven difficult over the long term. Pastoral societies have been practicing sustainable land management for millennia, yet they have been poorly recognised for that. Instead national policies and development investments have often aimed at reshaping pastoral resource management patterns, seriously undermining their livelihoods and contributing to degrading their environments. As the natural resource became further degraded and advancing agriculture and tenure arrangements impeded grazing strategies that reduced grassland recovery times, conflicts between sedentary agriculturalists and mobile pastoralists have increased. Recently, deeper investigations in rangeland ecological dynamics and in pastoral socio-economic patterns are helping redress wrongly conceived and misinformed development paradigms for these systems. The ecological principles behind conservation agriculture and sustainable livestock keeping are complementary; however policy dimensions and options must be redefined to ensure opportunities for both pastoralists and agriculturalists. Building grazing land resilience as well as managing the livestock-cropland interface to the advantage of pastoralists and agriculturalists can provide an important opportunity for improving relationships, efficiency, equity, and the environment in drylands.

Key Words

Pastoralism, drylands, livelihood, mobility, new range ecology, nutrient cycling, conservation agriculture, holistic management

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Pastoralism Today

Pastoralists are people who rely on mobile livestock rearing as the main source of their livelihood, involving a continuous symbiotic relationship and ecological balance between pastures, livestock and people. Extensive pastoral production occurs in some 25% of the global land area, from the drylands of Africa (66% of the total continental land area) and the Arabian Peninsula, to the highlands of Asia and Latin America. The World Initiative on Sustainable Pastoralism³ currently gives an estimate of 100 million to 200 million pastoralists worldwide; IFAD is currently working with a figure of 200 million. A multi-donor study of 1997 (Pratt et al.) talks of ‘an estimated 100 million people in arid areas, and probably a similar number in other zones, [for whom] grazing livestock is the only possible source of livelihood’, possibly including extensive mixed crop-livestock systems. For sub-Saharan Africa estimations vary from 22.5 million pastoralists (NOPA, 1992)⁴ to its double (Markakis, 2004). Swallow (1994) further estimated that in Africa there were 216 million, almost 10 times as many, agropastoralists deriving significant quantities of feed from natural pastures. It is always a sensitive issue to quantify pastoral populations as to where a line is drawn between pastoralism and agro-pastoralism.

Overall pastoral systems are important to global society as they support herders’ subsistence, provide large quantities of food and non-food products which play a major role in ensuring local food security, and contribute significantly to the national economies of poor countries (cfr. Nori & Davies, 2007). These contributions accrue from areas where soil, rainfall and temperature conditions provide limited effective options for alternative land uses. Furthermore pastoralists’ capacity to enhance protection and regeneration of the natural resource base compared to other land uses is also being increasingly acknowledged.

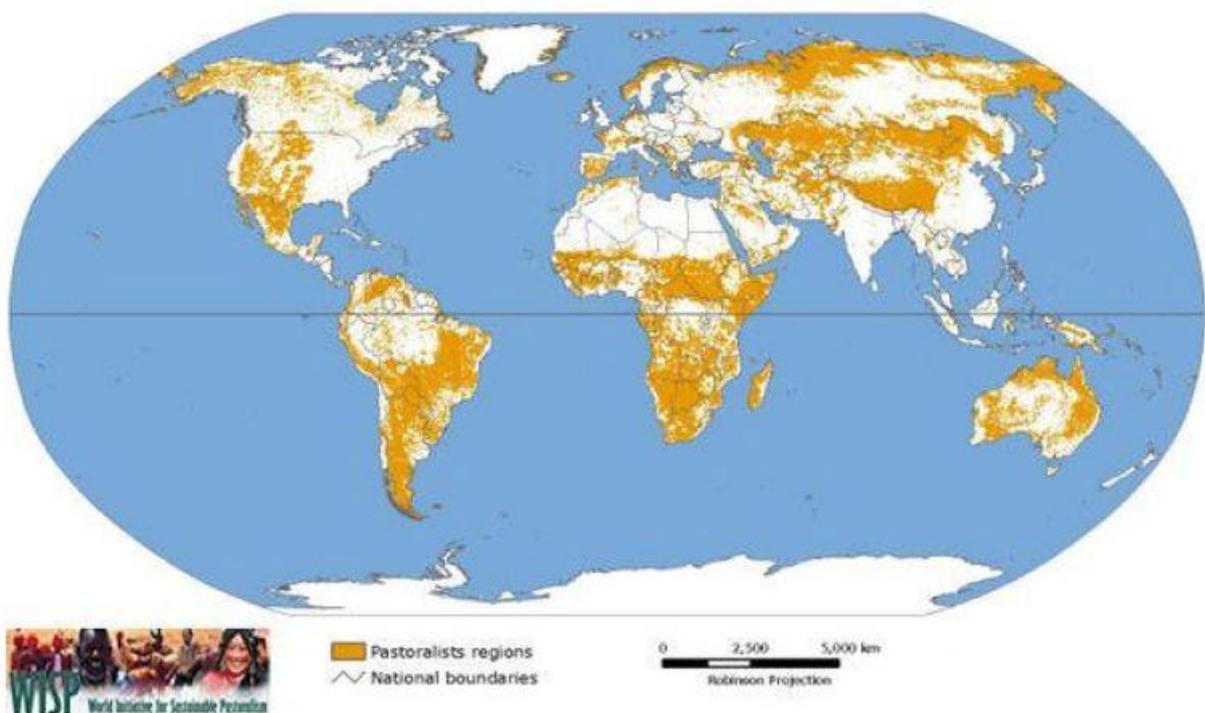


Figure 1: Global distribution of pastoralists (source: Nori & Davies, 2007)

³ <http://www.iucn.org/wisp/index.html>

⁴ “Nomadic Pastoralism in Africa”, A major review and research project funded by Unicef and the UN Sudano-Sahelian Office

There are strong commonalities in livelihood strategies of these groups exploiting distant and diverse drylands or highlands of the world, from Sub-Saharan African dry lowlands to cold Asian plateaux, from the tropical savannah to the cold northern steppe – a feature that is much less evident among other population groups across the globe. Pastoral groups inhabit environments characterised by resource-scarce, climatically marginal and highly variable agro-ecological conditions, where mobile livestock rearing has a natural comparative advantage and other land uses have been shown to be ineffective (Cossins, 1984; Hubl, 1985). The constraints posed by the physical and agro-ecological set up are critical in shaping the socio-economic livelihood patterns of pastoral communities, which hinge upon strategies that continuously adapt to a limited, highly variable and unpredictable resource endowment. Diverse pastoral societies are characterised by different animal species (Table 1). Studies have established the relationships between the animals characterising a pastoral society and the related agro-ecological and socio-political implications⁵.

Zone	Main Species	Current Status
Sub-Saharan Africa	Cattle, camel, sheep goats	Declining due to advancing agriculture
Mediterranean	Small ruminants	Declining due to enclosure and advancing agriculture
Near East and South-Central Asia	Small ruminants	Declining in some areas due to enclosure and advancing agriculture
India	Camel, cattle, sheep, goats	Declining due to advancing agriculture but peri-urban livestock production expanding
Central Asia	Yak, camel, horse, sheep, goats	Expanding following de-collectivisation
Circumpolar	Reindeer	Expanding following de-collectivisation in Siberia, but under pressure in Scandinavia
North America	Sheep, cattle	Declining with increased enclosure of land and alternative economic opportunities
Andes	Llama, alpaca	Contracting llama production due to expansion of road systems and European-model livestock production but expansion of alpaca wool production

Table 1 - Regional zonation of pastoral systems (Blench, 1999)

Currently, the majority of these zones are under pressures related to advancing agriculture which may be further exacerbated with expanding biofuel production.

The Lasting Peril Of Wrong Advice

Amongst the many specific features that characterise pastoral populations, one deserves peculiar attention: the highest rate of dramatic failures of development policies and investments (Sandford, 1983; Waters-Bayer & Bayer, 1994). The history of development initiatives in pastoral environments is a dramatic sequence of misconceptions, wrongdoings and ineffective investments. Already by the end of the 1980s Harrison quotes a World Bank survey that records 300 failed projects in Africa, partly or wholly concerned with livestock developments (1987:226), with the African pastoral sector experiencing the greatest concentration of failed development projects in the world.

⁵ Reference is made to the journal *Man*, volumes 4 to 7, 1969-1972.

The development discourse that has been driving interventions in these regions was triggered by the idea that herding societies had not been able to develop institutions capable of regulating the ecological balance between people, livestock and vegetation. Despite their existence and evolution in marginal and harsh environments for millennia, pastoralists have been perceived and pictured as economically irrational (Hardin, 1968), willfully ignorant (Bennett, 1988), self-destructive (Anderson et al., 1999), engaged as they seem in threatening peaceful neighboring communities and pillaging the natural environment (Haaland, 1977; Livingstone, 1977). By constructing the negative myths of overstocking, desertification and insecurity these theories paved the way to conceiving pastoralism as economically inefficient, ecologically dysfunctional and socially backward. Extreme drought events in the Sahel and the Horn of Africa during the 1970s and 1980s (which added to the infamous Dust bowl experience in US during 1930s) and increasing conflict in pastoral regions further supported this vision, that pastoral resource management was at the root of unsustainable livelihood patterns and processes of desertification.

Conceiving pastoralism as ‘wrong, destructive, or backward’ called for deep reforms both as a natural resource management and as a livelihood system. The rationale of these strategies was to make pastoral productive systems more profitable to the national economy, either by converting their lands to farming (and lately into natural parks), or by incorporating pastoralists into the market economy (Galaty, 1980; Talle, 1988). In that sense pastoral development was conceived as increase in the livestock productivity - with more livestock products available for local and export markets - rather than improvements in the welfare of pastoralists (Sandford 1983) and the recognition of their role in land stewardship (Lane, 1988). With this intent overall development policies and investments in pastoral areas have followed a progression that initially addressed technical solutions targeting the productive aspects of pastoralists’ main commodity (livestock), then moving to a wider approach targeting the tenurial and managerial aspects of pastoral natural resource base (rangelands). The illusion that development in such context was to be brought through material improvements aimed at enhancing productivity levels turned soon into the recognition that such interventions in the longer term proven unable to improve people’s livelihoods but rather undermined their ecological as well as socio-political fabrics (Gunn, 1990).

Period	1950s to 1970s	1980s to 1990s	More recently
Focus	technical aspects of the livestock production system	efforts aimed at readdressing range management	enabling environment for effective pastoral management
Actions	new breeds, forage production, feeding supplementation, animal health / veterinary systems, water availability	grazing reserves, group ranching, land titling, herders’ organizations,	policy reforms, institutional change, conflict resolution, regional mobility, credit provision, information systems

Table 2 - The three main stages of development interventions in pastoral areas

Unsuccessful efforts have led to dismantled livelihood strategies and degraded land health which created a cycle of increasing social and environmental impoverishment. To break this cycle, the development focus is now on enabling environments for effective pastoral management, policy and institutional change, conflict management and enhanced services for mobile livelihoods.

Threats, Promises And Root Causes

Although it is here acknowledged that the dualistic distinction between farmers and herders is of limited value - due to the dynamism and the interconnectedness of such systems which often rely on both crops and livestock production in complementary ways - and a wide range of agro-pastoralists do exist in practice, we utilise these terms here for simplification purposes to address interactions between communities who mainly rely allocate most of their time in crop or extensive livestock production. An extensive debate on this vanishing dualism can be found in Hussein, K. (1998).

Conflict stemming from competing for limited natural resources tends to be recurrent in pastoral areas (Blench, 1996; Hussein et al., 2000). Conflicts among mobile pastoralists and agriculturalists have been on record for hundreds of years where the two groups either co-exist, where pastoralists move onto sedentary farmland due to climatic factors and lack of forage or where farmers block access to pastoral resources (Umar, 2002; Nori et al., 2007; UNDP, 2007; SoS Sahel, 2008). Watering spots and grazing reserves in the dry season are often a matter of survival however these critical resources are typically located in expanding mixed rain-fed or irrigated farming systems (Peton, et al. 2006; SoS Sahel, 2008). While it is well documented that most pastoral rangelands are unsuitable for large-scale agriculture, policies at national and regional levels have continued to encourage sedentary farming or ranching, which reinforces the misguided view that pastoralists are traditionally unproductive and open the floor for conflictive relationships and unsustainable resource management.

Although conflictive relationships are often recorded, field reporters seem often less keen in assessing and describing the wide range of cooperative and synergistic relationships between migratory herding communities and the settled agriculturalists with whom they interact. Mutually dependent, their survival and prosperity depend on each other (Nori, 1998; van Driel, 2001). Pastoralists historically have capitalized on the presence of crop residues on farmers' fields at the beginning of the dry season after crops are harvested, when pasture available for animal grazing starts declining; farmers benefit from the nutritional value on animal residues, on their side. Exchanges between livestock protein-rich products and cereal crops are beneficial for both communities, and sedentary farming communities benefit in a number of ways from the environmental wealth of well-managed pastoral areas, as they provide for alternate food stocks which can be drawn upon in times of food crisis (i.e. edible nuts, roots). Pastoralism and agriculture must be thus viewed from an interdependent landscape and livelihoods perspective in the drylands in order to attend to root causes of emergent conflict, poverty and food insecurity.

BOX 1 - The Karo and Hamar groups: access rights and bond friendship

Bond friendship can be discussed with respect to the Karo and Hamar pastoral groups. The Karo and Hamar groups inhabit the south-western tip of Ethiopia bordering Kenya. The Hamar inhabit a mountainous area that is free of tsetse fly infestation, while the Karo live in the lowlands, where tse-tse flies are widespread. On the other hand, the Karo area is suitable for the cultivation of sorghum. The Karo gain access rights to grazing lands in the Hamar highlands through the institutions bond friendship and reciprocal gift exchange. The system works as follows: during the dry season, the Karo people keep their cattle with bond friends in the Hamar area. In exchange for the grazing land and their labour, the Hamar households keep most of the butter and milk for themselves.

The Karo families regularly visit their bond friends in the Hamar area. On their way, they engage in marketing activities. They sell products, like honey, and buy goods, like coffee and bullets. Upon arrival at a bond friend's home, the Karo families inspect their cattle and stay at their host's house for days and even weeks. The host often gives his guest sheep and goat. In addition to the gift, the Karo family takes home

some butter produced by its own cows kept with the Hamar family. The Hamar family, in turn, visits its bond friend in the Karo area and returns home with sorghum obtained as a gift from the Karo family. Resource-based conflicts often flare up between the Karo and Hamar people. However, conflicts rarely go out of control because the two peoples have developed mechanisms to manage disputes. Whenever a conflict arises, elders from both sides convene and settle the issue. As usual, the reconciliation process is part of an elaborate family accompanied by the ritual of goat slaughtering⁶.

This paper will focus on addressing two causal dimensions that have impeded sustainable livelihoods and landscapes in the drylands - through a) improving the ecosystem health (land health) that underpins all production systems and b) reframing access to the natural resource base.

Landscaping Herds For Non-Equilibrium Systems

Properly managed rangelands provide plants for human food, wood, thatching, shade and medicine, and represent important elements for nutrition, health and the general welfare of rural communities. Healthy rangelands provide important ecosystem services in the form of improved biodiversity of plant species, ground cover that increases water infiltration and storage, and carbon storage in soil organic matter (Savory and Butterfield, 1998; Batjes, 2004; Neely and Bunning, 2008; Neely and Hatfield, 2008). Many of these landscapes were maintained for millennia through animal impact and grazing as large herds of wild ungulates and pack hunting predators moved with seasons. Grasslands and grazers have co-evolved over millions of years and grasslands need grazers to facilitate energy flow and recycling of nutrients (McNaughton, 1979). □ A deeper understanding of historical grass and grazer interdependence dispenses with the long held notion that livestock and overgrazing, as typically understood, are the causes of land degradation (Savory and Butterfield, 1998). During the late 1980s and early 1990s through longer-term controlled studies, quantitative methodologies and sharper analytical tools (Gunn, 1990:29), scientists from the New Range Ecology approach were able to reverse the negative picture attached to pastoralists, by assessing and demonstrating that raising livestock through seasonal migration is a uniquely efficient way to draw the maximum well-being out of marginal areas unsuitable for other forms of agriculture – such as mountains or drylands - while also ensuring a good degree of environmental conservation, as the biodiversity, robustness and resilience of rangelands attest.

New range ecologists showed that arid and semiarid environments are inherently unstable, meaning that populations or other components are not in long-term balance with other elements of the system. Climate variability is so high and unpredictable that it represents the primary cause of complex ecosystem dynamics (Scoones, 1994; Ellis, 1994); livestock and vegetation do not control each other, and external shocks (i.e. drought) rather than endogenous processes (i.e. animal population pressure) determine livestock numbers and the state of vegetation (Ellis and Swift, 1988). The new model depicts semi-arid ecosystems as rarely reaching equilibrium, due to a number of bio-physical factors, compared to which management plays a limitedly significant role, so de-emphasising the effects of stocking rate on future productivity. Change in non-equilibrium environments does not occur gradually, does not follow successional models and does not show the classical feedback regulatory mechanisms. Non-equilibrium systems are fundamentally resilient in that rangeland plants rapidly recover when rain comes. In this perspective concepts such as ‘climax vegetation’, ‘overgrazing’ and ‘carrying capacity’ are accordingly highly problematic as they fail to recognize the variability and patchiness of arid lands ecology (Behnke 1994, Behnke & Scoones 1992, Behnke et al. 1993, Coughenour et al. 1985, Ellis & Swift 1988, Homewood & Rodgers 1991). Drought and desertification trends are viewed more the result of long-term climatic

⁶ Petros, 2000, quoted in Nori et al., 2007

oscillations/patterns rather than of detrimental local land use patterns/human activities – as the recent Climate Change debate is also demonstrating.

By challenging some basic, and often deeply embedded, concepts of naturalness, balance, and order, non-equilibrium dynamics indicated new ways to think about resource management and policy. Externally-led development based on equilibrium and predictability concepts proved unable to understand and support pastoral resource management which became increasingly recognised as a complex dynamical pattern of behaviour, fine-tuned to non-equilibrial and thus unpredictable ecosystem functioning (Ellis, 1994).

This revised understanding of range dynamics brought fresh elements in the analysis of pastoral societies, contributing to acknowledge that pastoralists a) do care about the conditions of the natural resource base (on which they depend), b) they have thus developed institutions accordingly and that c) these institutions are tailored and suited to the local environmental set up. Concepts of space and time variability and non-linear system interactions shed new light and provided a fresh view on pastoral mobility and overall management of complex rangeland ecosystems, which has in turn stimulated a more constructive approach towards pastoral resource management, and triggered a more comprehensive understanding of pastoral livelihoods (Behnke and Scoones, 1993; Nori, 2004).

Unmanaged grazing or complete exclusion from grazing will often lead to desertification and loss of biodiversity in all but high rainfall areas (Jones, 2006). In medium to low rainfall areas grasses which are not grazed can become senescent and cease to grow productively (McNaughton, 1979). Savory and Butterfield (1998) articulated key insights that inform how livestock can be used in non-equilibrium systems in a way that mimics historical herds and regenerates degraded lands through animal impact. These insights recognize a) the advantage of the behaviour of bunching animals that are continuously moving in order to distribute dung and urine, trample the plant residue, and chip the soil surface to enhance water infiltration; b) that overgrazing is a function of time (allowing appropriate recovery periods) and not numbers of animals; and c) that land and plants respond differently to different management practices (fire, grazing, animal impact, etc) depending on the distribution of moisture throughout the year. Based on these insights, a planned grazing method was developed and is currently being put into practice world wide. The livestock grazing management results in improved soil cover, increased water infiltration/retention, improved plant diversity and biomass, controlled time that plants are exposed to grazing, increased animal density and trampling, distributed dung and urine, and improved livestock quality and productivity. Principles and practices that are in line with those of Conservation Agriculture.

Niamir-Fuller, 1999 notes that grassland productivity is dependent on mobility of livestock and herders, the length of continuous grazing on the same parcel, the frequency with which the patch is regrazed, dispersion of animals and herds around the camp and interval during which the patch is rested. Further, she points out that pastoralists can maintain higher populations of herbivores in a given area if they have ensured and flexible access to the different habitats and resources. A greater number of cases are emerging that demonstrate that grazing strategies that use animal impact and allow for an appropriate recovery times can lead to improved land health. If such approaches are implemented at a landscape level, livestock can positively influence ecosystem health of rangelands leading, among others, to increased feed supplies and refurbished ground water supplies for crops and grazers thus reducing one of the causes of conflictive relationships – degraded or scarcity of the resource base.

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Righting The Rights Issue

Mobility is this critical for extensive livestock rearing through continuous tracking of critical feed, water and other pastoral resources through time. Swift has recently classified mobility according to its main purpose, whether related to production or exchange or escape purposes (Swift, 2008)⁷. Other classifications rely on the geographical dimensions of mobility and the applied patterns (refer to Nori et al., 2005). Extensive livestock keeping can exist for much of the year on arid lands so long as they have secure access to water and higher value forage (such 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.

Exchange-related mobility is also critical importance within pastoral livelihood patterns and indications are that its relevance is on the increase, as the market integration of pastoral livelihoods seems a characterising feature of most dryland environments (Nori, 2009). This form of mobility aims at enhancing opportunities to establish and develop reciprocal and interdependent relations with neighbouring sedentary communities (farmers, urban dwellers, etc.), to access different market opportunities (to sell own products and to purchase staples and inputs such as veterinary drugs), and to search for complementary livelihood sources. Exchange-related mobility is not necessarily finalised to generate an income per-se, but rather to access markets and products from other land users, to acquire or share information, to participate to wider networking.

Apart from the human and social capitals it hinge upon (i.e. indigenous skills over climate, environment and livestock functioning as well as extended networks and information systems) mobility also implies and involve access to a large set of resources. Misconceived development paradigms, traditionally unfavourable land and food policies and increasing land competition generated by growing population pressure have been increasingly squeezing herders' land rights and shrinking the scope of their moves.

As predicted by some theories (Boserup, 1965, 1981; Demsetz, 1967 and others), and indeed as pushed by most governments and international agencies (Kirk, 1999), growing population pressure, market development, and improved technology have in time lead to increased incentives to individualize access to resources (Kisamba-Mugerwa et al., 2006) largely contributing to increasing the insecurity and vulnerability exposure of herding communities.

Although pastoral resource tenure and control mechanisms are typically defined as 'communal', it is indeed difficult to find a concept that translates the complexity of these sophisticated access

⁷ Swift also mentions a third class under 'escape mobility', which is not considered here.

rights systems (Swift, 1994;), as their *fuzzy* nature implies overlapping claims to resources, shifting assertions of rights and continuous contestation and negotiation of access rules that dominate tenure arrangements in uncertain environments (Scoones, 1994; Deveraux, 1996). What is of relevance to herders is the option to access specific land resources at different times of need, rather than the formal control over a sporadically productive piece of land. While critically accounting for the conditions of the resources (whose value changes seasonally and inter-annually), a major concern is thus allocated to the user, as rangeland utilisation patterns have to adapt to herds' needs. It is the way a resource is utilized within a specific livelihood pattern that defines the claims and rights over it.

In this context individualization and privatization might not be necessary for either efficiency or sustainable resource management (Bromley & Cernea, 1989; Ostrom 1990), while it seems increasingly clear that individualization can lead to inequitable outcomes, increased conflicts, natural resource degradation and reduce pastoralists' ability to cope with risks through spatial mobility – thus critically affecting their livelihood (Behnke, et al. 1993; Swallow 1994; Scoones 1995; van den Brink, et al. 1995; Platteau 1996; Kirk 1999; Niamir-Fuller 1999; Nori, et al., 2008).

Of Residues and Reconnections

Conservation agriculture (CA) maintains the fundamental principles of permanent vegetative cover, rotating or inter-planted crops, and minimal soil disturbance (FAO, 2007a). As it has advanced among large scale commercial crop producers, conservation agriculture is more and more being taken up by small scale and limited resource farmers in many parts of the world including 15 African countries. In Zambia, for example, some 200,000 smallholder farmers are practicing CA (FAO, 2007a). In many countries increased yields have been reported as well an enhanced capacity to produce a crop in drought years indicating an important adaptation strategy relevant to climate change.

In Sub-Saharan Africa, adaptive applications of conservation agriculture have met with constraints relative to planting equipment alongside continued competition for plant residues for fuel or livestock feed (FAO, 2007a). This comes as little surprise in regions populated by millions of pastoralists and where more than half of the agricultural population subsists on farming systems in which livestock are a major component (Swallow, 1994; Dixon et al. 2001). FAO (2006) reports that livestock can be fully integrated into conservation agriculture, by exploiting the recycling of nutrients. They note that agriculturalists can augment the crop rotation by introducing forage crops for soil cover and fodder and, at the same time, reduce pest problems. For example, Brazil has introduced 'integrated crop-livestock zero tillage systems' (ICLZT) which aims to produce high yielding pastures while limiting deforestation. In these larger scale sustainable intensification systems livestock and pasture are incorporated into zero tillage systems (FAO, 2007b). However, while integrated livestock-conservation agriculture applications are viewed as beneficial, in the drylands, conflicts around the use of organic material for animal feed or soil cover have not diminished.

In his overview of crop-livestock systems in West Africa, Powell (2003) notes that at low population densities, crop and livestock production systems often operate as separate enterprises while at higher densities, functionally linked interactions increase between the crop and livestock production systems, building upon exchanges of grain, crop residue, water, genetic resources and manure (McIntire et al, 1992, Hoffman, XXXX). In these systems Powell (2003) identified animal manure as the most important soil fertility amendment and now, with fertilizer and energy prices high, it is likely that fertility of croplands will increase in its dependence on nutrients supplied from

rangeland in the form of manure. In Southern Africa, some farmers and pastoralists are currently innovating with using livestock to enhance the nutrient content and the minimum tillage using animal impact of the crop fields (Box 1).

BOX 2. Managing the interface in Zimbabwe

Community members in the Hwange communal lands near Victoria Falls, Zimbabwe have experimented with kraaling livestock overnight on their maize fields during the dry season. In this scenario, the livestock are herded in one herd/mob and grazed on rangeland through the daylight hours using a grazing plan to ensure animal impact and time of recovery of plants on the rangelands. At night, during the dry season, the animals are brought back to individual cropping fields, which have movable (and lion proof) kraals on small portions of the fields. The cattle have room to lie down and are only in the kraal for seven nights or less. The kraals are subsequently moved around the crop field. The benefits of this method include even distribution of nutrients but also some disturbance of crop field surface from the hoof action that serves as soil preparation for the subsequent crop – providing a resulting minimum tillage effect. On the crop fields where this has taken place, maize yields have been reported to be as much as 14 times the conventionally managed maize yields. On most fields other crops have also been intercropped which enhances agro-biodiversity and biomass production⁸.

As argued by Blench (1996), it is likely that the complex patterns of cooperation characterizing the multiple uses of many African wetlands would have probably never developed without initially conflictive relationships. The challenge is thus to disentangle the interconnectedness of existing rights and claims over contested resources and develop common institutional frames where a mutual benefit can be obtained through their sustainable management in a shared way. Within this frame, the difference existing between rights and claims over land and livestock resources are to be critically assessed and understood.

Cattle, Canaries and Crops

After decades of oblivion, extensive livestock rearing is gaining back priority concern on the agenda of international development agencies. A deleterious mix of misunderstanding and neglect has contributed to turning herders from a group considered as the better off amongst rural communities into the most vulnerable and food insecure. The climate change debate with its concern for communities residing under marginal climatic patterns, has turned societal attention back to herding societies, possibly with a ‘canaries in a coalmine’ syndrome - using them as indicators of what would be for the others under current trends of increasing temperatures and rainfall unpredictability.

In truth where climatic conditions become more variable extensive livestock production has the potential to sustain populations. Pastoralism may in fact provide food resources and secure a viable livelihood alternative where the climate change and other pressures on ecosystems result in enhanced unreliability of farming and the transformation of forest into savannah. Pastoralists seem thus better positioned than other societal groups in tackling the Climate Change challenges – as mobility and flexible resource access rights prove to be important assets vis-à-vis the adaptability requirements which are increasingly important in a changing environment. Indeed mobile livestock rearing can represent the best way to mitigate against climatic risk, particularly in marginal lands (Nori and Davies, 2007).

What we witness in the current context is that mobile livestock rearing already represents a growing activity in many marginal areas of the world. Many rural communities are increasingly rearing

⁸ Cfr. African Centre for Holistic Management; www.holisticmanagement.org

livestock in an extensive way as a strategy for diversifying their assets, as a response to the increase in variability and uncertainty that is associated both with the socio-economic environment as well as the climate, In India as elsewhere⁹. Conversely, some pastoralists are themselves seeking ways to diversify their livelihood base by incorporating other production systems, as evidenced by the increase in farming amongst West African Fulani. Enhanced interactions and synergies between the two production systems seems a promising way to make best possible use resources under variable climatic endowments. Indeed, the appreciation for pastoral resource management will even increase once governments, development agencies, scientists and private sector will accept to recognize the carbon sequestration potential of good grassland management on extensive land areas (Neely and Bunning, 2008), together with the other environmental services which pastoralists provide (and that the EU has started to remunerate accordingly).

The perception of herders as those amongst the most exposed and vulnerable to Climate Change dynamics is thus in a way contradictory, and seems to relate rather to the policy environment which is unfavourable to herders, rather than to pastoralists inadequacy to adapt to changing environmental conditions. In recent decades while in fact shifting rainfall patterns have been recorded, with more intense and longer droughts have been observed over wider areas since the 1970s, particularly in the tropics and subtropics (IPCC, 2007: 8), these have been paralleled by an increasing limitation posed to pastoralists to move through different territories, to access critical livelihood resources, to trade across borders, to benefit from appropriate investments, to participate in relevant policy decision-making¹⁰, thus affecting herders' capacity to anticipate, cope with, resist to and recover from the impact of such changes.

Fruitful options to strengthen collaborative links and mutually beneficial exchanges and contaminations between farming and herding groups are thus to be developed, especially in drylands areas, so to enhance the capacity of these communities to diversify their livelihood options and to enhance their adaptability vis-à-vis a globalising society and a changing climate. This process has to start from the acknowledgement and the recognition of the root diversity of the mechanisms and structures that govern resources access rights in these complementary systems (land and livestock).

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⁹ Vulnerability assessment and enhancing adaptive capacity to climate change in Semi Arid regions of India. Second International Workshop on Community Based Adaptation (CBA) to Climate. 2007 - <http://www.bcas.net/2nd-cba/Documents/tc-1a/Nambi.pdf>

¹⁰ Different contributions from two recent e-conferences, WISP, 2007 www.iucn.org/wisp/documents_english/WISP_CCAP_final_en.pdf and LEAD-ALIVE, 2006 http://www.virtualcentre.org/en/ele/econf_03_alive/

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