Future Scenarios for Pastoral Development in Ethiopia, 2010-2025

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Pastoral Economic Growth and Development Policy Assessment, Ethiopia

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EXECUTIVE SUMMARY

This report is the second in a series of papers that examine pastoral economies and development in Ethiopia. It starts with the premise that the government has an important role in promoting a positive view of pastoral economies and development to counter the very strong under-appreciation of the economic contributions of pastoralism. We believe that this lack of acknowledgement, in part, is based on misperceptions and a lack of understanding about the sector's important contributions to Ethiopia's national economy and development. In this report we address possible future scenarios for pastoral economies and pastoralism over the next 15-20 years and highlight four key contested areas that need to be resolved: (1) irrigation and other land uses versus pastoralism; (2) land tenure and the importance of mobility and flexibility; (3) settlement and the issues associated with pastoral sedentarization; and (4) trade and especially the question of overseas export versus regional/unofficial cross-border and domestic marketing. ***We start our analysis with two very different future narratives about pastoralism. One is that of a vibrant and growing pastoral economy that contributes to local and national welfare and economies, supports a range of different market options, builds conflict resolution mechanisms between government and local communities, secures pastoral land rights and mobility, and provides economic options for those exiting pastoralism. The second is that of a depressed and unviable pastoral sector that depends on food aid, aggravates existing conflicts, results in higher national consumer prices for animal products, and leads to steep declines in foreign trade earnings.*** Which of these two narratives--or elements of them—will hold true for the future largely depends on government policy and on the growth of other sectors of the national economy.

Several different trends are reported here that are likely to affect pastoral economies in Ethiopia during the next 15-20 years. First, pastoralism will continue to transition toward a model of a fixed base camp/settlement and mobile satellite camp where animals seasonally migrate with mainly young males but part of the family remains sedentary. This strategy allows some family members to trade, work, and/or seek services in small towns and settlements on a part- or full-time basis. ***The key, however, is that livestock remains mobile to take advantage of Ethiopia's vast rangelands and environmental variability. It should be noted that mobility also is a characteristic of the ranching sectors of many industrialized economies, including the USA, Australia, and Spain.***

Secondly, and related to the first point, small and medium-sized towns will continue to grow in pastoral regions, outpacing the growth in rural populations, and will help to spur an increasingly diversified economy. These towns and the growth of rural-urban linkages will provide both opportunities and challenges to pastoral economies during the next 15-20 years.

Thirdly, pastoral households themselves will continue to diversify to include waged employment, agriculture where this is feasible, and trading activities as supplements to livestock-based incomes. The percentage of so-called 'pure' pastoralists that depend on livestock for >90 percent or more for their income will decline, especially in areas where cultivation is possible.

A fourth trend that will affect future scenarios in pastoral areas will be the growth in education, which already is increasing at the primary level but will also grow at secondary and post-secondary levels during 2010-2025. While general enrolment ratios (GERs) in primary school attendance in pastoral areas are still well below national averages, they are improving and in 2006 they were reported to be 21.9 and 30.3 percent for Afar and Somali Regions, respectively (Ministry of Education 2008). PARIMA (Pastoral Risk Management in East Africa) research findings also support this general finding that pastoralists of southern Ethiopia are increasingly open to sending their children to school, although levels of achievement remain low (McPeak et al, fortcoming). For the future the implications of an increase in education levels will mean that: (1) pastoralists will achieve better skills and be able to access better paying jobs; and (2) they will participate more fully in civic activities and the democratic process by lobbying for improved policies and programs for their communities. At present there is an overly centralized approach to policy making and program planning in pastoral regions and a limited role for civil society organizations, including NGOs, as evidenced by the dominant role of the MoFA (Ministry of Federal Affairs) and federal government in pastoral affairs. Pastoralists need to be equipped to engage with a 'literate' world – with government, the media, and donors – and we recognize that political literacy is a key to empowerment.

We expect that the education of women will still lag that of males unless the government takes strong action to redress past inequalities in educational access. With the growing number of educated pastoralists and improved access to employment, the significance of remittance flows to pastoral regions will grow considerably and fuel investments both in pastoral and non-pastoral activities. ***Moreover, as education and waged employment grows and men migrate to towns for work, women are likely to assume even a greater role in pastoral economies.***

Fifthly, the role of markets and demand-driven outlets for animal products and livestock will continue to grow and make pastoralism economically viable well into the future. We see herders and traders taking greater advantage of the growing demand in domestic and regional African markets, as well as continuing to participate in export markets to the Middle East and, eventually, Asian markets. ***As incomes and urbanization grows in Ethiopia, the demand for milk and meat products will increase considerably over current levels and most of this demand will need to be met from pastoral areas.***

Sixthly, we expect continued pressures on pastoral rangelands and challenges to pastoralism by outside investors, neighboring agriculturalists, mining/mineral interests, and state-financed irrigation schemes. These threats highlight the need for land legislation and official recognition on common pastoral lands and these pressures are unlikely to slow down in the next 15 years. This is an area where the government must play an important role to protect pastoral lands, a protection that is provided in Ethiopia's constitution but not implemented in practice. ***Unless there is land and legislation reform that recognize pastoralists' rights to their own lands and resources, we will continue to see increased conflict and insecurity in these areas and heightened ambiguities over land rights.*** In addition, these policy actions must be linked with a recognition of the strong economic contributions that pastoralism makes to regional economies and GDP (see Little et al, 2009), to counter claims that better

uses of pastoral lands bring higher returns to local and national economies (see discussion later in this report).

Finally, and related to point six above, unless constructive actions are taken, conflict will continue to damage pastoral economies and development possibilities, especially in the Somali Region where on-going conflict has disrupted trade, food production, education and other activities. ***The presence of conflict will override most of the positive trends in pastoral economies discussed in this document and strongly shape future trajectories in pastoral areas unless peace is instituted, especially in the Somali Region.***

INTRODUCTION

This report is the second in a series that examine pastoral economies and development in Ethiopia as background analyses for future government policies and programs. It looks at future scenarios in pastoral regions during the next 15-20 years: what will be the key trends and forces shaping pastoral economies in the future; and which of these trends are most relevant for future policies? In the following pages we present our best assessment of the key forces that will drive pastoral economies and development in the future. It is based on available data both from secondary and primary sources and from existing literature and project experiences. The report starts with the premise that the government has an important role in promoting a positive view of pastoral economies and development to counter a widespread under-appreciation of the contribution of pastoralism to the national economy. We believe the bias against pastoralism in the country, in part, is based on misperceptions and a lack of understanding about the sector's important contributions to the national economy and development. The state and its agencies and policies will play a key role in determining if some of the positive scenarios for pastoral development that are discussed here will emerge in the next 15-20 years. Although several issues related to pastoral economies are discussed, we highlight four key areas that are most critical: (1) irrigation and other land uses versus pastoralism; (2) land tenure and the importance of mobility and flexibility; (3) settlement and the issues associated with pastoral sedentarization; and (4) trade and especially the question of overseas export versus regional/unofficial cross-border and domestic marketing. The important issues of conflict, governance, and education overlay each of these four themes, often in complicated ways, and also will shape future scenarios in pastoral areas. We feel that policies surrounding land use, land tenure, sedentarization, and trade in pastoral areas need the most urgent attention.

In the report we present several possible directions that pastoral economies in Ethiopia could take during the next 15 years depending on the enabling policy environment, access to different markets, land and resource use, environmental constraints, conflict, and population and settlement patterns (for another discussion of future directions for Ethiopian pastoralism, see UN OCHA-PCI 2007). ***A hopeful and positive scenario for 2025 is one where mobile pastoralism and agro-pastoralism still produce valuable foods and products for a growing urban population and a vibrant trading sector. Incomes in cities and domestic markets have grown along with the demand for animal products, including value-added products like pasteurized milk and butter, UHT (untra-heat treated) milk, and processed and packaged meats.*** Regional cross-border and overseas export trade remain important but the growth of the Ethiopian economy and population has meant new domestic market opportunities. Under this context pastoralism has transitioned toward a model of a fixed base camp/settlement and mobile satellite camp where animals seasonally migrate with mainly young males to take advantage of rainfall/forage uncertainties in the lowlands, but part of the family remains sedentary. In this 2025 scenario settled family members are able to trade, work, and/or seek services in small towns and settlements that have grown considerably and support value-added industries and enterprises, such as abattoirs, fattening operations, livestock trading, and feed companies that build on the dominant livestock sector. Although human populations increasingly are sedentary, herd mobility is supported by legislation that protects migratory routes, key common

property resources, and the land and water rights of pastoral communities. With resource rights protected, conflict and violence in these areas has declined by 2025 and governance structures are in place to resolve any emergent disputes before they erupt into destructive conflicts. Government parties work together with local leadership and community elders to mediate conflicts and pastoralists now have considerable voice in how disputes are settled and how their resources are utilized. Irrigation has a role in this new economy of 2025 but it tends to be focused on smallholders rather than large estates and has not been developed at the expense of livestock producers. The pastoral regions remain with large expanses of rangelands that also are suitable to wildlife populations and an important tourist trade has developed to take advantage of the favourable wildlife herds and viewing. Small and medium-sized towns and the growth of rural-urban linkages in pastoral areas also have provided opportunities for pastoralists who have opted out of the system, either through hardship or individual choice, and the development of infrastructure (including communications) has helped to stimulate economic activity in these centers. Education at all levels both for males and females is more accessible in 2025 and pastoralists have taken advantage of these opportunities, allowing them to attain better paying jobs in government and private sectors, both locally and nationally. An educated and skilled cadre of pastoralists is critical to advancing pastoral participation and rights in the political process, especially the rights of women, as well as investment in town-based enterprises and industries. Finally, in this positive scenario for 2025 food aid is greatly reduced from 2010 levels and, except for extreme droughts and other emergencies, it only is required for the 10 percent or so of the population who are elderly without working dependents and/or destitute. Improved pastoral and non-pastoral incomes and enhanced rural-urban linkages have meant that cash is available to purchase grains imported from other parts of the country.

A second and not so favourable scenario for 2025 is one where land and resource rights of pastoral communities are not protected, mobile pastoralism is restricted through the appropriation of key pastoral resources and important migratory routes for non-pastoral uses (e.g., large-scale irrigation), and market opportunities are restricted to heavily-subsidized overseas trade channels. Widespread environmental degradation occurs as remaining pastoral herds are forced onto smaller and less productive lands, and most of the key pastoral riverine areas are taken over by large-scale irrigation schemes, which makes the entire pastoral enterprise unviable. Under this scenario conflict is endemic as well-armed pastoral communities fight to defend their lands, markets, and livelihoods, and food insecurity is widespread as pastoralists can no longer produce foods nor earn the cash to purchase them. In this 2025 scenario the tourist trade precipitously declines as wildlife herds disappear with the loss of open rangelands and widespread insecurity which discourages travel to these areas. The costs of food aid and humanitarian assistance also is very high and dwarves other forms of development assistance and investment in the area. Similar to what is found today (2010), towns are pockets of widespread poverty and food aid distribution and mainly attract the destitute and ex-pastoralists who can no longer make a living from a heavily-constrained pastoral sector. Most employment opportunities in towns are limited to low-waged casual labor, petty trading, and charcoal making and firewood gathering and there are few value-added industries. These towns continue to

grow as impoverished, ex-pastoralists flock to them to seek food aid and petty employment opportunities and, consequently, their hinterlands experience serious environmental problems through overuse by herds of poor herders and from fuelwood extraction and charcoal production. Women and children especially suffer under this sub-optimal scenario since they are most vulnerable to negative processes and likely to suffer serious nutritional problems as a result. With widespread poverty and the decline in pastoral incomes, enrolment in schools suffers as there is little cash to buy school supplies and books and cover school fees. At a national level consumers in towns and cities are experiencing higher prices for animal products since local demand can not be met from the domestic livestock sector with the reduced viability of lowland pastoralism. Instead, urban consumers would have to increasingly rely on imported meats and dairy products, including powdered milk and other expensive items. Finally, the demise of the pastoral sector and its production capacity damage foreign exchange earnings as live animal and chilled meat exports also decline along with the sector. The capacity to meet both of these activities is almost completely dependent on a vibrant pastoral economy.

Which of the two general narratives outlined above for 2025 is in the interest of the Ethiopian economy? ***Will it be (1) a vibrant and growing pastoral economy that contributes to local and national welfare and economies, or (2) a depressed and unviable pastoral sector that increases dependence on food aid, aggravates existing conflicts, results in higher consumer prices for animal products, and leads to steep declines in foreign trade earnings?*** The following sections of this and the next report (# 3) outline different processes and policy options that can help promote a positive future scenario for 2025 and avoid economically and socially costly outcomes.

LAND USE

We begin with a consideration of land use and the key resources, such as river valleys, that sustain pastoral economies. There are several key perennial rivers that cross pastoral areas in Ethiopia, but the Awash is the most intensively developed of them. Hydroelectric power generation, a national park, and four different agricultural production systems – cotton cultivation, sugar cultivation, livestock rearing and small-holder mixed farming and pastoralism – all compete for the scarce water and land resources of the Awash Valley. The different ways that the Awash can be used illustrate some of the recurrent analytical and policy challenges that are part of regional planning for the pastoral lowlands. The following section summarizes a comparison of the relative costs and benefits of three alternative agricultural land uses – for cotton, sugar and livestock production. These results apply in detail to conditions in Awash, but because of its advanced level of development relative to other river basins in lowland Ethiopia, the Awash exemplifies several general problems of pastoral area development.

Livestock production

To compare the costs and benefits of pastoralism and irrigated agriculture, we estimate the economic returns to livestock husbandry versus various forms of crop agriculture. Our unit of comparison is a hypothetical hectare of riverine floodplain left to pastoralism versus the same hectare converted to cotton or sugar production. In doing

this calculation, we recognize that pastoralists spatially utilize land well beyond river valleys but that it is seasonal access to the hypothetical hectare of riverine floodplain that drives the entire system both in riverine and non-riverine rangelands. Thus, the next section of the report estimates the returns to pastoralism from the seasonal use of this hypothetical average hectare. These returns are the opportunity costs of irrigation – the benefits of pastoralism that are forgone whenever a hectare of valley pasture is converted into irrigated sugar or cotton.[1] Subsequent sections of the report examine the capacity of cotton or sugar cultivation to compensate the national economy for the loss of this pastoral resource.

Estimating the economic benefits of pastoralism requires quantified information on a broad range of biological and economic variables. Research conducted by ILCA (the International Livestock Centre for Africa, later ILRI) and academic researchers provided this material (Behnke and Kerven 2010). The object of our analysis is to convert the forage of a 'typical' hectare of valley grazing into livestock products with a monetary value. This calculation can be summarized as follows:

The calculation begins with an estimate of primary production – the amount of natural vegetation produced on a given area of floodplain grazing, a certain proportion of which is usable as forage for livestock. Estimates in the scientific literature for floodplain forage production from the Awash Valley vary widely, so the results of our calculations are expressed as two estimates of livestock output – one based on low (scenario a) and the other on high levels of riverine forage production (scenario b in the following table). Most pastoral herds spend only a portion of their year grazing on floodplain vegetation, with the actual amount of time spent in the Awash Valley varying from herd to herd and from year to year depending on rainfall conditions. Access to these critical pastures drives the entire pastoral economy and determines most measures of livestock productivity and economic performance, as well as the sustainability of the system itself. ***It is the access to these critical riverine pastures that makes other less productive lands useful for pastoralism, and without seasonal access to the former then the latter lands cannot be used and the entire pastoral economy is likely to collapse.*** For purposes of this calculation, we have assumed that herds spend six months of the year feeding on floodplain grazing, with the rest of the year spent on rainfed pastures outside the valley bottom.[2]

Different herd species produce different combinations of dairy, traction or meat products at different rates, and male animals yield differently than female animals. Herd output estimates are based on the average productivity of different kinds of animals in a typical pastoral Afar herd, as described in the scientific literature.[3] The value of this offtake is expressed in monetary terms using the same producer prices for livestock and

[1] Note that this does not include the economic impact of conversion on surrounding land. Conversion of key dry season pastures to irrigation could also render surrounding pastures less productive by removing a key resource.

[2] The exit of pastoral herds from the valley for half of the year has the effect of doubling the estimated livestock carrying capacity of valley pastures. For example, valley pastures that produce 3 tons of feed per year could, on average, support 1.3 permanently resident TLU (tropical livestock units) requiring a standard yearly ration of about 2300 kg/TLU/year of feed. With herds absent for half the time, this same hectare will support about 2.6 TLU with similar feed requirements, half of which are now met on upland grazing and half in the valley.

[3] Based on Davies (2003) annual litres of milk production per adult female for human consumption is estimated to be 401 cattle, 1033 camels, 76.5 sheep and 92 goats; surviving offspring per breeding female per year is estimated at .42 offspring for cattle, .275 for camels, .765 for sheep and .82 for goats.

their products in 2008-09 that are used by the National Accounts Department, Ministry of Finance and Economic Development, for calculating national GDP. The costs of production – which in this case are mostly labor costs – are also expressed as a cash value based on local wage rates.

The results of this calculation are expressed in Table 1. As explained previously, scenario (a) is based on the lower levels of riverine forage production and scenario (b) on the higher levels of forage output, both documented in the scientific literature.

Table 1: Net returns in Ethiopian birr to one hectare of riverine land under seasonal pastoral land use, 2008-09 prices

Scenarios	Value of gross output	Husbandry costs	Net returns
Low stocking rate (a)	6307	337	**5970**
High stocking rate (b)	12596	673	**11923**

Cotton cultivation and ginning

Cotton cultivation produces a raw agricultural commodity – seed cotton – that is then processed into lint cotton and seeds, which are used to manufacture cloth and oil, respectively. Seed cotton is comparable to the live animals and milk production used in this analysis to calculate the returns to pastoralism – all are 'raw' or lightly processed agricultural commodities that farmers might sell onward for further refining. Table 1 shows the returns to seed cotton farming on MAADE in Amibara District, in the 1980s a state-run cotton farm. Despite respectable yields, the farm was unprofitable in this decade. The farm was also losing annually between 200-300 ha of cultivated area to salinity, a cost that is not reflected in Table 2 since reclamation was not taking place. According to estimated reclamation costs at that time, about half of the gross revenue of the farm would have been spent on reclamation in order to maintain a stable farm size. In sum, inclusive of development, reclamation and operating costs, average annual loses per hectare from 1980-90 were EB -2,412 or the equivalent of US dollars $ -1,165/ha at 1990 exchange rates.

Table 2: MAADE yields, operating expenses and revenue from seed cotton 1980-90

Year	*Area (ha)*	*Yield, 100 kg/ha*	*Production costs, EB/ha*	*Gross revenue, EB/ha*	*Profit or loss, EB /ha*
1980	*6337*	*31.7*	*4267.9*	*4021.0*	*-247*
1981	*7940*	*29.4*	*4255.7*	*3730.0*	*-526*
1982	*9268*	*24.9*	*3554.6*	*3158.0*	*-397*
1983	*11169*	*24.6*	*2898.0*	*3124.0*	*226*
1984	*13000*	*32*	*3476.2*	*4060.0*	*584*

1985	*12470*	*32.8*	*3499.3*	*4170.0*	*671*
1986	*12998*	*32.4*	*3541.2*	*4118.0*	*577*
1987	*12998*	*26.6*	*3547.1*	*3380.0*	*-167*
1988	*12058*	*23.7*	*3736.0*	*3012.0*	*-724*
1989	*12696*	*21.8*	*3843.1*	*2774.0*	*-1069*
1990	*12318*	*17.7*	*3526.0*	*2250.0*	*-1276*
Average	*-*	*26.15*	*3650.0*	*3402.0*	*-248*

Source: Said 1992 Appendix 5 and tables 6.4 and 5.3

By 2009 MAADE had shrunk in size, ceased to be a state farm and was instead leased to a private investor. Table 3 shows that this smaller, privatized farm slipped in and out of profitability in the period between 2004 and 2009. This modest improvement in economic performance was achieved despite lower yields due to long-term underinvestment in infrastructure. Land was still being lost to salinity and overall soil fertility was probably declining, irrigation canals and equipment were under-maintained and ground water levels were elevated, no land reclamation was taking place and in some years no fertilizer was used, and for decades fields had not been re-leveled to promote efficient irrigation. In short, after about 40 years of cultivation, the MAADE farm was showing its age, and the best that good management could achieve was to mitigate these disadvantages.

Table 3: MAADE yields, costs and revenue from cotton production and processing 2004-09

Year	***Area (ha)***	***Yield, 100 kg/ha***	***Production costs, EB/ha for seed cotton***	***Gross revenue, EB/ha from seed cotton***	***Profit or loss, EB /ha seed cotton***	***Profit or loss, EB /ha lint cotton***
2004-05	*6569*	*16.4*	5348	4920	-428	-941
2005-06	*6569*	*19.57*	5868	5382	-540	-1745
2006-07	*6515*	*24.88*	6037	6966	929	4240
2007-08	*6448*	*19.95*	5283	8977	3694	5555
2008-09	*6368*	*27.16*	8318	11407	*3089*	

Source: Unpublished MAADE records, 2004-09

A cooperative cotton farm run by an Afar pastoral community near Gewane presents a different picture, see Table 4. While yields are roughly double those of MAADE, seed cotton production is profitable but is nothing compared to the exceptionally high profitability of exporting ginned lint cotton, which was the cooperative's sales strategy in 2009. These are exemplary results, but there are nonetheless reasons for caution. In addition to exceptionally committed management, the cooperative farm has the advantage of newly cleared fields that lay fallow in the transition years from the Derg to the EPRDF. Whether present yields can be maintained over decades of use is unclear. Like the other private 'investor' cotton operations in this region, the cooperative is also heavily subsidized by government expenditure, paying nothing for the maintenance of

irrigation infrastructure, for water, or for the initial costs of land development. A comprehensive assessment of the economic performance of the cooperative would need to take account of these largely hidden costs.

Table 4: Gewane clan cooperative yields, costs and revenue from cotton production and processing 2008-09

Year	*Area (ha)*	*Yield, 100 kg/ha*	*Production costs, EB/ha for seed cotton*	*Gross revenue, EB/ha from seed cotton*	*Profit or loss, EB /ha seed cotton*	*Profit or loss, EB /ha lint cotton*
2008-09	*70*	*42.9*	12513	19287	6774	*30714*

Source: Interviews with cooperative managers, 2009

Sugar cane cultivation and refining

Like cotton, sugar production begins with a raw agricultural commodity – sugar cane – that is comparable to the live animals and dairy produce sold by pastoralists. The first stages of processing turn sugar cane into three intermediate products –raw sugar, molasses and baggasse (cane residue after pressing). Table 5 shows the profitability of both sugar cane cultivation and the processing of raw sugar at the Metahara Sugar Factory over the last ten years.

Table 5: Metahara Sugar Factory – sugar cane yields, costs and revenue from cane cultivation and the processing of raw sugar and molasses

Year	*Area (ha)*	*Yield sugar cane, ton/ha*	*Net revenue EB /ha sugar cane*	*Net revenue EB /ha raw sugar + molasses*	*Net revenue EB /ha Afar pastoral livestock*
1999-00	*6568*	*152.6*	26220	*16105*	4767
2000-01	*6650*	*156*	27816	*11532*	*4352*
2001-02	*6678*	*152.9*	29777	*4883*	*4558*
2002-03	*6813*	*153.5*	31715	*13843*	*4948*
2003-04	*6605*	*171.4*	33620	*15218*	*5012*
2004-05	*6162*	*172.4*	33670	*12660*	*5799*
2005-06	*6609*	*173.7*	37642	19534	6971
2006-07	*7090*	*165.1*	33477	30332	7325
2007-08	*7056*	*160.2*	29797	*35672*	*8413*
2008-09	*7588*	*158.3*	29481	*49981*	*11927*

Source: Unpublished data from the Metahara Sugar Factory

Based on high and reasonably stable cane yields, both cane cultivation and raw sugar processing have been reliably profitable for a decade.[4]

[4] Returns per hectare for raw sugar and molasses are based on the total annual sales of these products as reported by the factory management, divided by the area of the entire concession, 14,733 hectares.

Livestock, cotton or sugar?

We are now in a position to ask what is the best future use of the Awash valley – for livestock, cotton or sugar? The answer to this question is complex and draws upon but is not limited to the preceding rudimentary comparison of these production alternatives.

At 2008-09 prices, the estimated annual net returns to pastoralism per hectare of valley pasture were about EB 6000 at the lower range of potential stocking densities, up to more than EB 12,000 at high animal densities. These benefits are in marked contrast to annual losses of more than EB 2,000 per hectare suffered by the MAADE state cotton farm in the decade of the 1980s. As long as the comparison is with state cotton plantations, there is no argument – pastoralism is unequivocally the more productive use of the scarce floodplains and river water of the Awash and its tributaries. At least up to the mid-1990s, state-owned cotton plantations in the middle Awash provide a clear example of dysfunctional development – a country investing in making itself poorer.

Cotton also appears in an unfavourable light if we look at current yields on the newly privatized MAADE farm. Despite conscientious management by those who now run the farm, years of cultivation have reduced yields to the point where farm profitability is marginal and appears incapable of paying for the expensive maintenance, reclamation and repairs needed to recover decades of lost soil productivity and inefficient water use. Over the five years from 2004 to 2009, average profit per hectare from cotton cultivation was EB 1350, whereas livestock over the same period would have yielded between EB 4040 up to EB 8080 per hectare. If this farm is a reliable indicator of the future, cotton farming is not as profitable as pastoralism and it leads in the long term to soil salinization, and is environmentally and economically unsustainable without costly public subsidies.

The situation is more equivocal by 2008-09 and when pastoralism is compared to cotton cultivation on a locally managed cooperative farm, which gave an annual net return of EB 6774 per hectare, roughly equivalent to our lower estimate of livestock productivity on the same land. Approximate productive parity between pastoralism and cotton farming means that the opportunity costs of excluding pastoralism from sections of the Awash valley are roughly comparable to the economic benefits of the cotton farming that might replace it. The promotion of cotton farming has changed the agricultural production systems that exploit the valley, but there probably has been no net economic benefit for the Ethiopian economy from these changes.

Sugar is a different proposition. If the state's cotton interests are shrinking, its involvement in sugar is expanding with the creation of vast new estates. The economic motives behind this expansion are suggested by the overview presented in Table 5. Here it can be seen that the net returns per hectare from sugar cane are slightly more than double the highest estimates and roughly four times the lower estimates for livestock. However, it should be noted that sugar prices worldwide are at a 25 year

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Annual estimates of net revenue per hectare from sugar cane are based on the total imputed value of cane output divided by the cultivated area, with unprocessed cane valued at United States producer prices converted from dollars into Ethiopian birr. All estimates of profits are net of operational and overhead/indirect costs, including depreciation on fixed assets. Given Metahara's favorable location, the estimates of livestock revenues are based on the high estimates of forage output.

high, which may or not be sustainable, but the scenario for this commodity will look very differently if prices for sugar begin to decline (personal communication, Ian Scoones).

But the Metahara Sugar Factory neither buys nor sells cane, which it cultivates to use as an input in the manufacturing of raw sugar and molasses, and the profits from sugar and molasses production are several multiples of the profitability from pastoralism. Like the Gewane cotton cooperative but on a vastly different scale, the Metahara Sugar Factory makes its real profits not from simple farming but from agriculture combined with industrial processing. As semi-refined products, lint cotton, raw sugar or molasses are not comparable to unprocessed pastoral produce in the form of live animals or dairy output. Their direct comparison is invalid, and yet there is no denying the financial returns to the Metahara Sugar Factory or the economic benefits to the Ethiopian economy of raw sugar and molasses production. What does livestock offer that can compare?

Adding value to livestock production

On the outskirts of Metahara town, the entrance to the ELFORA Agro Industries slaughtering facility and meat processing plant sits opposite the gate to the Metahara Sugar Factory. Limitations of time prevented the collection of data on the economics of top-end meat processing from ELFORA or from similar businesses, including their employment effects. This is an area of the livestock sector that badly requires additional research to help guide effective policy. However, it can be safely predicted that the value to be derived from a nutritionally beneficial commodity like animal protein will, when data is available, compare favourably to the profitability of refined sugar. Historical trends are in favour of meat processing. In industrial economies like the United States, sugar consumption peaked a couple of decades ago, and inflation adjusted American producer prices for cane have been stagnant for a decade. Demand for meat and meat prices are, on the other hand, elastic to changes in income and are likely to continue to rise with increasing prosperity in developing countries, including in Ethiopia. As will be discussed in a subsequent section of the report, international agricultural production and trade trends underline the current and future profitability of livestock. By 2050 it is estimated that livestock production will need to double in order to meet growing demand in developing countries (Sere 2009). Given the size of the national herd, there can be little doubt of the comparative long-term advantages of livestock production for Ethiopia.

The immediate problem for Ethiopia is not that livestock cannot be made profitable, but rather that so little of what Ethiopian pastoralists currently produce is converted into high value-added products. It is this kind of conversion that the pastoral sector must increasingly make if it is to remain competitive with other forms of land use and retain control of the key resources that make range-based livestock production possible. As will be discussed later in the report, the most immediate way to add value to livestock and their products is to improve the marketing of these commodities. However, part of the problem has been underinvestment in animal agriculture. According to a study by OAU-IBAR, in the late 1990s the Government of Ethiopia allocated only 5 percent of its recurrent expenditures on agriculture and less than 0.3 percent on livestock or 3 percent of the recurrent agricultural expenses (Aklilu 2002: 6).

With respect to the cross livestock border trade, underinvestment has left

Ethiopia without an internationally credible animal health surveillance and inspection system that would protect exporters from sudden and destructive import bans in consuming countries. With respect to the trade of livestock within Ethiopia, the need for further investment in rural roads means that transport costs amount to about a quarter of the total costs of animals shipped from the lowlands for fattening and processing in the highlands. In drought emergencies, the poor road network is even more crippling. In the 2006 drought in southern Ethiopia, the physical limits to commercial destocking by highland traders were set by the road network. Traders penetrated into rangeland areas only where the roads allowed them access with large vehicles and where the condition of the roads was good enough to permit the haulage of weakened animals without high levels of *en route* mortality.

These examples of underinvestment make a simple point: Compared to the investment in irrigation, there has been no comparable investment programme for livestock, which makes a comparison of the current profitability of livestock, cotton and sugar a poor indication of future possibilities.

Settlement policies

To be effective, increased investment in pastoral areas would need to be matched by fundamental changes in some long-standing aspects of Ethiopian pastoral policy. Settlement policy is one of these. The problem is not that Ethiopia has a pastoral settlement policy, but that it has a settlement policy that encourages sedentarization of pastoralists. By rural Ethiopian standards, pastoralists tend to be reasonably well off (Davies and Bennett 2007). Regional welfare data reflect these economic realities. According to MOFED's 'Development and Poverty Profile of Ethiopia for 2002', heavily pastoral Somali Region emerges as the wealthiest of all Ethiopia's rural regions; on the other hand, the region in which pastoral land loss is most advanced, Afar, is the next to the poorest in Ethiopia, followed only by Tigray (Devereux 2004). Simply settling pastoralists is no solution.

The pastoral areas of Ethiopia nonetheless do need policies to deal with growing human populations and those who have been forced through drought or other shocks or willingly have chosen to exit pastoralism. Pastoralism, unlike some alternative forms of agricultural and industrial production, has a poor capacity to absorb surplus labour. In pastoral systems, output is ultimately determined by the availability of natural forage and the number of animals it can support. Beyond the labour requirements of these systems, more humans mean more consumers but little additional production and the alternative is seek other livelihoods. Under demographic pressure, pastoral systems do respond with changes in livestock and human diets, increased levels of trade, more diverse and intensive production practices-- but there are limits to these coping strategies. In the final analysis, the most productive pastoral systems are those that have the capacity to shed surplus people into alternative livelihoods.

There is some evidence that some Ethiopian pastoral systems are under population pressure, per capita herd wealth is falling, competition over natural resources is on the increase, and impoverishment is taking place (see Sandford's statement [2006] and the response to it by Scoones and Devereux [2006]). Desta and Coppock report a 19 percent decline in per capita cattle holdings for the Borana areas of southern Ethiopia during 1988-1997 and a 37 percent decline for 1980-1997 (Desta and Coppock

2004). These are not problems that are easily solvable within the pastoral sector. They are symptomatic of the historical inability of Ethiopia's urban, industrial economy to absorb unskilled rural labour, from either a farming or livestock background. Both in terms of product prices and the ability to shed surplus population, prosperity in pastoral areas is dependent upon the growth of the broader Ethiopian economy, especially the non-farm employment sector. What is important is not whether people live in portable dwellings, but how gainfully they are employed, in or outside of the pastoral sector.

LAND TENURE

No agricultural system can prosper and be productive without secure access to resources. Pastoral livestock production is no exception. In formal terms, the legal status of pastoral land is similar to that of farm land, and the rights of Ethiopia's pastoralists are little different from those of its farmers. For all kinds of agricultural land, the state retains ultimate control. In practice, however, the security of tenure for farmers has improved with the gradual codification and registration of their land rights, while security of tenure for pastoralists has eroded. Specific laws have not been developed to implement the pastoral land rights that are protected by the Ethiopian constitution, and without legal guarantees, pastoralists have no security of possession if individuals or outside interests wish to appropriate their land. The increased accessibility of pastoral areas to outsiders and the clear commercial and conservation value of pastoral land has accelerated pastoral land loss in recent decades.

Lowland ecology, mobility and pastoral tenure

Pastoral production systems require tenure systems that facilitate livestock mobility. For a variety of reasons, many pastoral households in Ethiopia are less mobile than they once were; most may eventually settle at least part of their families. But pastoral herds will need to continue to move if they are to respond flexibly to the erratic and seasonal distribution of pasture and water resources that is characteristic of the lowlands. The need for livestock mobility is not just an African prerequisite but is found in successful commercial livestock enterprises in Europe and the USA where ecological and climatic variability necessitate it (see discussion later in this section). The first step towards designing appropriate pastoral land tenure systems is to understand why livestock mobility must be preserved and the economic benefits that it brings.

Nomadic movement of animals is often seen as a 'primitive' and unproductive way of life. The following statistics suggest otherwise. They compare cattle performance in nomadic versus settled herds in western Sudan. As the following table shows, nomadic cattle consistently out-perform sedentary cattle across a wide range of indicators.

Table 6: The performance of settled versus migratory cattle in western Sudan

	Migratory	**Sedentary**
Calving rate	65%	40%
Females first calving under four years old	65%	29%
Total herd mortality	15%	35%
Calf mortality	11%	40%
Meat production per breeding female	.057 kg	.023 kg

Source: Wilson and Clarke (1976).

How does herd mobility contribute to the maintenance of these relatively high levels of performance?

If a herd is confined to one place, livestock numbers and productivity are limited by the scarcest resource in that particular place. As long as conditions are constant, good times are pretty much like bad times and being tied to one place is not too much of a liability. On the other hand, movement becomes attractive when – as in semi-arid Africa – conditions fluctuate widely such that a grazing area that is extremely attractive at one time becomes virtually unusable in another. The most economically effective response to such fluctuations is to simply move away from problems, especially if one environmental zone or area offers good grazing possibilities precisely when other areas are unsuitable. Mobile herds can then move from one favourable area to another, avoiding resource-scarce periods in each zone that they visit. In this way mobile livestock producers can maintain over a wide geographic region a larger and more productive livestock population than could be sustained by separate herds each confined to its own small area.

The following table examines the implications of these conclusions for domestic livestock production in Africa. It compares output from settled commercial ranching versus open-range pastoralism in the Sahel, Eastern and Southern Africa.

Table 7: The comparative productivity of settled ranching and pastoralism in semi-arid Africa

Country	**Productivity of pastoralism and ranching (ranching = 100%**	**Units of measure**
Ethiopia (Borana)	157% relative to Kenyan ranches	MJGE/ha/year
Kenya (Maasai)	185% relative to East African ranches	Kg protein production/ha/year
Botswana	188% relative to Botswana ranches	Kg protein production/ha/year
Zimbabwe	150% relative to Zimbabwe ranches	Zimbabwe $/ha/year

Sources: Barrett (1992), Cossins (1985), Ridder and Wagenaar (1984), Vries and Djiteye (1982), and Western (1982).

The studies cited here captured in one unit of measure – protein, calories, or cash – the combined value of the diverse array of dairy, traction, meat, and fertilizer products generated by indigenous African herds. All these studies expressed this output on a per hectare basis, which makes possible a direct comparison of land productivity under different production and land tenure systems. According to these studies pastoral systems consistently outperform sedentary ranching systems not by a narrow margin but by orders of magnitude.

Mobility does pay in unstable environments, a fact that many industrial livestock producers in advanced economies are well aware. To this day,

American ranchers in the western USA practice seasonal mobility, keeping their cattle on privately owned valley-bottom land in the winter and moving them to public-owned highlands for summer grazing. In localized droughts, Australian ranchers lease each others' properties and truck animals hundreds of kilometers to obtain grazing that is unavailable at home. In Spain the national government has designated a system of legally protected drovers' roads for long-distance sheep flock migrations, and mobility remains an important part of extensive livestock husbandry in France, Brazil and Romania (see the articles in a special issue of *Pastoralism* – 'Mobile pastoralism in the industrial world' (vol 1, no. 1, 2010). In all these cases livestock movement is retained by advanced industrial producers because it is technically efficient and economically cost effective, as it is for Africa's indigenous livestock producers.

Movement in industrialized settings is made possible by land tenure arrangements that make it legal – through regulated access to state lands in the US, government-protected long-distance trek routes in Spain, or the exchange of private leases in Australia. Economically optimal land tenure systems for Ethiopia's pastoral lowlands will be those that preserve high levels of herd performance by facilitating mobility. We now need to examine what this kind of land tenure system might look like in the future.

Common property

The self-regulated and shared use of natural resources is termed common property resource management. Research over the last three to four decades has demonstrated the capacity of common property systems to conserve and profitably manage resources such as fisheries, forests, water rights and rangelands in a wide variety of industrial and developing economies.

One economist has succinctly characterized common property systems as private property for a group; a distinction is drawn in the literature between open access systems, where consumption of the good is rival and non-excludable and common property systems, where consumption is rival and excludable at the group level. From this description it is clear that Ethiopia already possesses a form of common property – the collective control of rangelands and water sources by pastoral groups. Moreover, government already condones the involvement by these groups in resource management. Ethiopia needs specific laws that put into practice the pastoral land rights that are enshrined in the country's constitution.

The government already is successfully involved with rural land certification in cultivation areas of the highlands (Deininger et al 2008), so there might be a window here for examining the feasibility of some form of land certification, probably on a community or group basis, in the pastoral areas that would secure local land rights. Registration or certification also would provide some protection against the current expropriation of pastoral lands that presently is occurring. The key will be to seek a land registration format that secures pastoral land and water rights, but does not compromise mobile pastoralism in the lowlands (Ian Scoones, personal communication). ***Research on different land registration/tenure models that would work in Ethiopia's pastoral areas is sorely needed at present Although a land tenure solution for the pastoral areas must make sense in the Ethiopian context,***

examples from West Africa where governments have developed formal laws could suggest models for pastoral land tenure legislation. These laws are summarized below, with a few illustrative examples. A more complete list and translation of relevant West African legislation is given in Annex I.

Recognition of livestock mobility:

Mali provides an example of a comprehensive set of laws to preserve livestock movement that can have relevance for Ethiopia's pastoral lowlands. Pastoral routes are classified as part of the public domain and under government protection (Article 52), and movement is sanctioned for purposes of nomadism or transhumance 'across the whole national territory' subject to restrictions on protected areas and animal sanitation requirements (Articles 4, 5 and 14). Article 23 regulates cross-border livestock movements, as follows:

> 'In the context of the policy of regional integration, the movement of Malian livestock herds for international transhumance to neighbouring countries is authorised….. Similarly, the entry and movement of herds from neighbouring countries on Mali's territory for the purpose of transhumance is authorised subject to reciprocity and according to bi-lateral and regional agreements linking Mali.'

Protection of pastoral resources:

Mauritanian law explicitly disallows any physical barrier to free pastoral movement: 'No land will be leased in a pastoral area if it prevents herders from accessing pastoral resources' (Article 15), regional land use plans must identify areas where settlement is prohibited (Article 19), and development around water points is prohibited if 'it might have a negative impact on water discharge or animal access or change the land use system away from pastoralism' (Article 25). Niger also forbids land tenure arrangements which could legally impede movement:

> … all forms of exclusive appropriation of pastoral areas under the public domain of the State and local government is prohibited. In particular, no land may be leased if it constrains the mobility of herders and livestock as well as access to pastoral resources (Article 5).

Nested rights of access and resource control:

In traditional African pastoral tenure systems the landscape is seldom carved up into neat territorial packages owned by distinct groups. Instead any area is likely to be claimed by a number of different ownership groups of various size and composition, with overlapping claims to territory based on specific claims to different kinds of resources within it, such as stock water, pasture, arable land, or trees. Primary owners of an area typically share it with a host of secondary users who have more restricted claims to certain kinds of resources or rights of temporary or seasonal access. While they may only be utilized during certain times of the year by different groups, they are

not ‘vacant’ lands as sometimes referred to in Ethiopian policy discussions, and they are claimed by varied pastoral communities. West African legislators have found legal expressions to balance these shared access rights. Examples from Mali include: ‘After harvest, livestock may graze fields. Resident livestock of the concerned local government have priority access’ (Article 35), or the proviso that public wells are open to use by everyone, but ‘resident herders in the local government where the well is located have priority access’ (Article 44). Shared but locally regulated access to grazing is expressed in Niger law as follows:

> Pastoralists can, at their request, benefit from a priority right of pastoral use of natural resources situated in their home area. The priority right of pastoral use does not prevent the implementation of customary rules of management and use of pastoral areas, in particular the third party access to water and the right of grazing (Article 11).

Arbitration and enforcement procedures:

Administrators and customary authorities can usefully mediate between the interests of competing pastoral groups and individuals. The need for such mediation will be fairly constant in lowland environments in which rainfall, resource productivity, people and animals are all continually rearranged in space, and land use issues cannot be sorted out once and for all. One solution to this impasse is for the authorities to promulgate procedural as well as substantive land law. This approach would specify the institutional framework within which interested parties could legitimately put forward their claims to resources, the administrative/jural institutions that should process these claims, and the criteria for choosing between competing claims. An example of this approach is provided by the Mauritanian law setting up ‘mediation commissions’ to rule in cases of livestock damage to crops (Article 35). The law specifies the membership and legal authority of these commissions at different administrative levels, but leaves the details of decision-making to the common sense of those on the commission.

In Ethiopia the precedent for legal institutions of this kind is provided by the meetings at which government and customary authorities work together to negotiate an end to inter-group conflicts.

Key resources and future land use and tenure

Our best effort at comparing the profitability of livestock, cotton and sugar in the Awash Valley suggests, as a businessman rather than an academic would put it, that regarding conversion of pastoral land to alternative uses, there isn’t much in it. Computational uncertainties abound, but rough productive parity is probably a fair characterization of the relative competitiveness of these alternative agricultural systems. Much depends not on which productive system is followed, but on the skill of those who practice it and on the level of outside investment in it. Real world uncertainties also complicate these comparisons. In particular, global climate change is likely to impact both on rainfall and river flow levels in the Ethiopian lowlands. Any decline or increased variability in rainfall from year to year – both of which are possible – would tip the balance towards mobile livestock production and against dryland farming or water-demanding forms of irrigated agriculture. As argued in report one, pastoralism appears

unproductive largely because government statistics systematically overlook the contribution of livestock and livestock products to the economy. It is only by ignoring the contribution these lands currently make to national income that allows one to argue these 'empty' or 'unproductive' lands will be put into production of national income through transformation. When the challenge is outperforming the existing system rather than zero contribution, we again return to the idea that gradual transformation of pastoralism rather than transformation to an alternative production system appears to be a viable path forward.

Key resources – often relatively small but extremely productive areas that serve as drought and dry-season refuges for pastoral herds – are the assets that allow mobile pastoralists to exploit vast, erratically productive rangeland areas. The economic performance of pastoralism, its capacity to support human populations and to ride out droughts, depends on continued control of these key assets, especially river valley lands. Few other interest groups are drawn to the empty expanses of rangeland that pastoralists can profitably exploit, but there are competing uses for key resources, many coming from government itself.

Assuming that the government was willing to protect pastoral lands from outside interests, including their own state-sponsored irrigation schemes, one can anticipate a process of rapid economic development in the lowlands undertaken and funded by pastoral elites. Indigenous pastoral tenure systems are not immune to commercial influences. Across Africa, commercial opportunity has provided an incentive for local pastoral elites to privatize high-value communal resources, often at the expense of the majority of their fellow community members. Improved prices for pastoral produce will accelerate this process, by providing the capital for development and by creating the economic incentive for elites to appropriate scarce and increasingly valuable resources. The economic inequality resulting from such a 'land grab' could in theory be prevented by state regulation, though there is scant evidence of this actually happening in modern, sub-Saharan Africa. A more likely scenario is the displacement of many ex-pastoralists by state- and private-financed agricultural schemes, a process that would be made less painful by their education for formal sector employment, vibrant small towns (see discussion in next section), and by a buoyant national economy capable of employing rural migrants in urban areas.

Development along these lines may eventually lead to the loss of some key resources to pastoralism, as has occurred elsewhere. But at least initially, cultivated areas are likely to be small and intensively used for food crop or high-value horticultural cash crop production, permitting a mixed system of pastoralism and arable farming, potentially integrated through forage crop cultivation. Diverse farming and pastoral systems are likely to coexist, in response to local ecological variability, the in/accessibility of markets or processing plants, and the variable scale of different farming operations. One currently finds these systems in higher rainfall areas; for example, they exist near Hagre Mariam in Guji Zone, Oromiya Regional State where ecological variability over a limited geography juxtaposes diverse cultivation systems with nearby lowland pastoral systems.

The alternative to land development driven by local pastoral elites is more of what is currently taking place: the expropriation of vital pastoral resources to create huge, integrated plantations and processing complexes. As we argued in our earlier

report, these vertically integrated enterprises have several apparent advantages from the perspective of government. The value added to raw agricultural output by these enterprises is visible to economic planners, and easily taxed by the state. But there are also disadvantages. All farming ventures are vulnerable to disruption caused by changes in market prices or the weather, but the size of plantations exposes them to large-scale environmental and economic problems if things go wrong, and the uniformity of plantation agriculture can leave a region without alternatives if the plantation system proves unworkable. Table 2 on the MAADE scheme presented earlier hints at these risks. This was an operation, it will be recalled, that was profitable in some years and loss making in others. Table 3 shows that the processing of lint cotton both increased profits in good years and magnified the financial losses to the farm in bad years, as compared to raw seed cotton cultivation. Planners should ask themselves if this is the kind of production system that they wish to encourage in a natural environment like the pastoral lowlands that is intrinsically unstable.

RURAL-URBAN LINKAGES

Pastoralism in Ethiopia is changing towards a model with a fixed base camp/settlement and a mobile satellite camp, where animals are migrated with mainly young males but part of the family remains sedentary. This strategy allows some family members to trade, work, and/or seek services in small towns and settlements on a part- or full-time basis. This is opening up new access by pastoralists to small towns in all pastoral regions, but is most advanced in Somali Region and Borana Zone of Oromiya Region. Moreover, as populations and pastoral incomes increase and widen, small towns are likely to play an increasingly important role in promoting development in pastoral areas. Small (> 5,000 population) and medium-size towns (>20,000) can play integral roles in pastoral economies of the region, even though they present both opportunities and strong challenges.

At least three important challenges are likely to constrain beneficial linkages between rural pastoral areas and urban centers. First, are environmental and infrastructural considerations. Mobile herders often avoid staying near towns too long because grazing and water conditions are usually not as favorable there as in other less populated areas. Overgrazing around towns is one of the major environmental problems in East Africa's rangelands and, thus, herders usually cannot access town-based services like education nor can they wait around for market prices to improve without jeopardizing their herds and lands (see Mahmoud 2003; Fratkin and Roth 2004).

A second challenge to strengthening rural-urban linkages for pastoral development is that urban-based jobs and businesses, even in pastoral regions, often are dominated by non-pastoralists (see Getachew 2001; Little et al. 2001). This is especially the case in Afar Region where more than 50 percent of the town population and most of the enterprises are non-Afar. Because of their mobile lifestyle and the poor availability of education facilities in pastoral zones, herders often lack the skills to acquire those good salaried positions which often go to outsiders. In addition, with the very important exception of Somalis most herders in the region historically did not invest in town-based businesses and trading enterprises. 'Ethnic strangers', in turn, came to dominate the urban business sector, in part because they have better access to investment capital (see Mahmoud 2003). Thus, with the exception of a very small

minority of wealthy herders, most pastoralists in towns mainly have access to low-paying occupations and petty-trading activities.

Finally, major deficiencies in electricity and water systems, roads, telecommunications, and finance systems constrain investment in pastoral towns and the growth of beneficial rural-urban linkages. Entrepreneurs are unlikely to invest in towns with minimal infrastructure and traders often avoid rural markets that have poor roads and, thus, high marketing costs.

Different Processes of Pastoral Settlement and Urbanization

Small pastoral towns attract herders from both ends of the socio-economic spectrum. At the bottom poor and destitute herders seek town-based opportunities, including food aid, to supplement their meager livestock-based incomes, while rich herders at the top will settle in or near towns in order to pursue real estate and business opportunities unavailable in pastoral areas. From an economics perspective, it makes sense for better off households to diversify after a certain threshold of herd size since returns to pastoralism can decline and risks increase with exceptionally large herds. Thus, for the poorest herders towns symbolize new types of survival strategies, but for the richest towns represent a new arena of investments and income diversification.

Wealthy herders pursue town-based investments, but most of the movement to towns is by poor pastoralists escaping drought, famine, and conflict, all of which have been aggravated by poorly planned and implemented government policies and programs.[5] In fact, we do not expect this trend to slow down over the next 5-10 years (see Table 8). For example, from 1997-2006 small medium-sized towns in Somali Region grew about 4.2 to 5.1 percent per annum, which was about twice as fast as the region's rural population (see Table 8). In 1997 the region had 30 towns with a population of at least 5,000 and 7 with more than 20,000 and both the number of small towns with more than 5,000 is likely to be at least 37 in 2009 and the number of larger towns (>20,000) is estimated to be 9 in 2009 (Center for Development Consulting 2007). With widespread insecurity and conflict in large parts of Somali Region the growth in urban populations is unlikely to slow in the near future, and the percentage of internally displaces persons (IDPs) moving to cities will only increase until peace comes

Table 8. Population of selected urban centers in Somali Region, Ethiopia[a]

Urban Center	1975	1987	1997	2004
Jijiga	12,000	31,000	62,000	95,859
Gode	8,000	32,000	NA	44,312
Degehbur	4,000	20,000	29,000	40,665
Kebridehar	4,000	17,000	24,000	35,480

[5] Remittances to pastoral areas from international Diaspora populations are increasing, especially in Somali Region, and this also represents a pool of capital for business investment.

Awbere	4,000	17,000	24,000	NA

[a] Table is partly based on Centre for Development Consulting (2007: 18)
[b] Based on our analysis of existing demographic data in Centre for Development Consulting (2007).

to the Somali Region. The growth in refugee and internally-displaced populations that have been associated with conflict in Somali has meant that in some towns 50 percent or more of the population has been internally displaced.

In Afar the growth in small towns has been less spectacular but during 1997-2006 the population of towns with populations greater than 1,000 grew at least 32 percent during this period with the exception of one town. In contrast to Somali Region where the urban population was about 19 percent of the region's population in 2006, it was only about 5 percent in Afar Region during the same year (Gebre-Egziabher and Little 2008). The devastating effects of drought in the region also stimulate migration to towns. These destructive events have occurred at intervals of 5-6 and, more recently, 3-4 years, and with current global climate forecasts their frequency is unlikely to diminish during the next 15 years (Little et al. 2001). Each successive drought damages livestock holdings and forces to towns another exodus of stockless and near-stockless herders pursuing survival-type livelihoods.

A third factor has been the implementation of numerous state and NGO-sponsored settlement schemes (including those based on irrigation) that often result in new towns or expansion of existing centers. These interventions have been commercial ventures, such as in the Awash and Shebelle river valleys, as well as programs to resettle or encourage settlement among pastoralists. In many cases these initiatives carved out large chunks of pastoral lands and effectively displaced communities of pastoralists, often turning them into causal laborers. Governments and some NGOs often encouraged these settlements by making services, such as water and health clinics and food relief, available in towns to entice pastoral sedentarization.

There are several obvious examples of positive and dynamic relations between rural pastoral areas and towns in Ethiopia. Livestock trade is one since towns serve both as staging points for long-distance trade outside the region and final consumption centers, especially the larger towns (>20,000). Rural-urban milk markets is another case and its success is highly dependent on town consumers. Indeed, rural-urban milk markets demonstrate the important linkages that are maintained between regional towns and their rural hinterland. The largest pastoral towns often have daily dairy markets with specialized milk traders and peri-urban producer/traders that fill important niches in the market that are not served by pastoral milk traders. Both Jijiga and Gode towns (Somali Region) have multiple daily markets where dairy products can be purchased. The dairy trade also is highly gendered and provides significant income and benefits to pastoral women (see Nduma et al. 2001). Sellers often are from mobile pastoral families who have settled near towns because of drought or other hardships or because of opportunities for petty trade and wage employment.

Towns also assume considerable importance in the delivery of veterinary inputs and fodder for livestock population and food for people. Veterinary drugs are a major urban-based input that is provided to herders. Purchases of food, in turn, account for the vast majority of herder household expenditures (50 per cent or more in most cases) and

many of these are sourced in towns. Consumption/expenditure activities probably represent the most important cash linkage between towns and the pastoral sector (Little 1992).

The Important Role of Education

The special challenges of providing gainful town-based employment for those exiting pastoralism is strongly tied to education. Some of the challenges for educational service provision to pastoralist areas in Ethiopia include: low population densities resulting in long distances to schools; mobility of population; lack of teachers willing to live in these areas—which results in teacher shortages as well as poorly motivated teachers; lack of cash to pay for schooling, especially for secondary and tertiary schools; a household economy dependant on child labor, with children spending long periods away from the settlement; inappropriate curriculum; lack of trained manpower at regional and woreda education offices; high gender disparity in educational opportunities; and a focus on formal education but little on non-formal education. Consequently, many pastoral children still are unable to access non-formal or formal schools.

The Federal government of Ethiopia has recently displayed a willingness to diverge from conventional formal schooling and adapt educational services to the needs of pastoralists by devising modes of delivery specifically for pastoralists, including mobile schools. The new educational and training policy stipulates the commitment of the government to offer special support to marginalized areas that were deprived of education services in the past (MoE, 2008). Several education modalities and approaches are in place, and these include Alternative Basic Education (ABE); mobile schools (which caters for those not adequately captured by ABE, such as the boys who seasonally migrate with livestock in search of water and pasture); Para-boarding schools; Hostels; and formal primary schools.

Until recently, attempts to increase enrolment and achievement have been made through the expansion of conventional formal schooling which has been unresponsive to the needs of pastoralists. Efforts to support the development of pastoral education received special attention in the last six years and there have been some notable gains (see Table 9). On the basis of the Education Training policy, the third education sector

Table 9: Students enrolled in primary and secondary schools, Afar and Somali Regions, Ethiopia, 2002-2008

Region	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08
Afar	34,876	38,669	46,175	57,537	59,148	71,856
Somali	130,276	130,276	201,150	201,150	201,150	387,644

CSA Education Data, 2002/03-2007/08

development program (ESDP) has given due consideration to mainstream pastoral education. The key lesson learnt was “The impossibility of addressing the educational

needs of pastoralists children through conventional schooling alone" (Ministry of Education 2008:10).

Over the next 15-20 years there will be a significant increase in the enrollment of pastoral children in primary, secondary and tertiary institutes. The gap in primary Gross enrollment ratio (GER) between the Federal level average and that of the region should decline. As it stands now there is a significant gap in the GER. For instance in 2006, the GER for the country was 91.3% while pastoral regions of Somali and Afar had an average primary GER of 30.3 and 21.9%, respectively (MoE 2008). Given increased diversification in the future, pastoralists will be disadvantaged if they do not have adequate education. The assumption is that education is a means towards creating a population that is literate, employable and which can participate in the market-driven economy. While primary education is free, secondary school education still remains expensive and unaffordable to pastoral families.

More pastoral students are now enrolled in colleges and other institutions of higher learning than in the past. Lower entry grades for students from the pastoral region are a welcome trend in increasing school attendance. Whether literacy and pastoralism can complement each other remains a question, but the more educated leaders that they have, the better they will be able to plan for their future development.

Small Towns in Pastoral Areas of Ethiopia

The most obvious point about pastoral towns in pastoral regions is that rural-urban linkages and urban hierarchies are considerably more developed in Somali than in other pastoral regions. A comparison of urbanization in Somali and Afar regions highlights this reality. For example:

- the number of small towns of at least 2,000 population are 46 in Somali region but only 13 in Afar;
- there are 7 towns in Somali region with populations of 20,000 or more but only one in Afar based on a 2006 estimate;
- in Somali region ethnic Somalis comprise the majority of the urban population but in Afar region ethnic Afar comprise only 33 percent of the urban population (Afar Region town census data, 2006);
- the majority of town-based businesses in Somali region are owned by Somalis but in Afar the majority are owned by non-Afar;
- due to past and on-going conflicts, there is a much larger internally displaced and refugee population in Somali than in Afar region. These phenomenon have accounted for an important segment of town growth in the Somali region.

The challenges for strengthening the role of small towns in pastoral development in Afar Region relate to better opportunities for beneficial livelihood diversification and employment, rural-urban market systems, and town business opportunities for Afar. Regarding the latter issue, the dominance of the regional commercial sector by non-Afar often means loss of profits and revenues to the region and, in some locations, spontaneous privatization of farm and pasture areas by non-Afar. As Getachew notes, in Afar "the expansion of irrigated farm schemes and small towns, while displacing the local Afar pastoralists, has attracted not only many poor Afar households, but also thousands of Non-Afars into the area (2001:123)." With the exception of a few well-

connected clan leaders and other Afar notables, the bulk of Afar in towns are poor, former herders (ibid).

By contrast, in Somali Region business ownership and trading networks are mainly controlled by Somali and while there are many impoverished urban Somali there seem to be considerably more middle and wealthy urban Somali than urban Afar. The main constraint for the improvement of rural-urban linkages in Somali Region relates to large-scale conflict and instability in key parts of the region, which has effectively destroyed long-standing trade and investment linkages between towns and rural hinterlands.

The government acknowledges the importance of small towns for rural development. To quote Gebre-Egziabher and Little:

> "The Ethiopian government recently has promoted efforts to strengthen the role of small towns in rural regions and build on existing marketing and consumption links with rural hinterlands. We find that Ethiopia's PASDEP poverty reduction strategy framework for 2005/06-2009/10 acknowledges the importance of small towns and rural urban linkages. PASDEP is supported by rural and urban policies that are supposed to contribute to a market-based economy. . . PASDEP's emphasis however, is on agriculture rather than pastoralism-based growth and poverty alleviation."" (2008:3).

As noted earlier, several town-based enterprises have obvious linkages with the pastoral sector, including retail businesses, small-scale dairying, and hides and skins processing. Larger-scale investments in value-added enterprises, such as abattoirs for the national and international meat trade, require infrastructure investments in water and electricity and transport that may only make sense for larger cities in pastoral regions (Gebre-Egziabher and Little 2008). ***In general, however, the whole area of rural-urban linkages and, particularly, the role of small towns in promoting pastoral economic growth is very poorly understood and shouts for additional investigation and research.*** The development of important value-added industries and enterprises in the pastoral sector is highly dependent on functioning small towns and rural-urban linkages and we simply do not know enough about how they operate in pastoral areas to promote effective investment policies.

LIVESTOCK AND ANIMAL PRODUCT TRADE

The issue of trade in livestock and livestock products has risen in prominence due to a variety of factors. One is that studies such as Delgado et al (1999) point out that there is likely to be a rapid growth in demand for livestock and livestock products over the first 20 years of the current century due to a combination of population growth, urbanization, and rising incomes, especially in Asia. Policy decisions, including in Ethiopia, made now will determine how production systems can meet this demand. Tambi and Maina (2003) describe three key ways increased demand can be met with increased supply: increased herd sizes, increased offtake rates from a given herd size, or increased productivity per animal. Analyzing FAO livestock production data, they find that from 1978 to 1998 the volume of beef production increased by 3% per year on average in East Africa, which is attributable to increased herd sizes rather than the other two causes. Given land constraints and population growth, there is reason to be

concerned that herd growth will not be capable of capable meeting growing demand growing forward without leading to real price increases for livestock products.

. A second reason for the current prominence of livestock products in policy discussions reflects changes in global trade agreements, in particular the agreements between the ACP countries and the EU. There are currently active negotiations that will influence the prospects for a successful livestock export strategy.[6] On December 21, 2007 the Cotonou agreement that governed trade with the ACP countries and the EU expired, leading to the current negotiations between the Ethiopian government and the EU for an Economic Partnership Agreement (see Hamouda et al. 2006 for an assessment of the impact of this agreement). As far as we could determine, the negotiations continue while trade between the EU and Ethiopia operates under the 'everything but arms' agreement signed in March 2001.

Trade and Animal Disease

McLeod and Leslie (2001) discuss the interaction of policies that address livestock disease and those that lead to export promotion. They note that with the end of the GATT, the establishment of the WTO, and the establishment of the SPS agreement has opened global livestock product markets in ways that were not possible in the pre-1995 environment. Key to this is a given country's status with regard to diseases on the World Organization for Animal Health's (commonly referred to using the acronym for their former name as the Office International des Epizooties or OIE) List A[7]. For a given disease, the OIE has identified a 'pathway for freedom' for a disease. At one extreme is where the disease is endemic. At the other is where it is eradicated. McLeod and Leslie identify 8 different states of the disease that can exist in a country from the extreme of endemic to eradicated. In laying out these states, it becomes possible to identify where a given country is with regard to a particular disease, and begin to assess the costs and benefits of moving toward eradication. They find that few studies find that the benefits of eradication justify the costs in terms of improved productivity domestically. However, when disease status inhibits access to international markets, the benefits may outweigh the costs.

Scoones and Wolmer (2006) outline different strategies that can be taken in regard to livestock health and export markets. One is 'disease eradication for safe trade'. Inspired by the success of the rinderpest eradication and control effort, and recognizing the international marketing opportunities that have opened up, this

[6] With regard to the livestock sector, the Lome agreement had a quota system for certain ACP countries in the meat sector: for example, Botswana 18,916 mt, Namibia 13,000 mt, Zimbabwe 9,100 mt, Swaziland 3,363 mt, Madagascar 7,579 mt and Kenya 142 mt (Agrisystems Limited, 2003). The Lome agreement that was in effect from 1975 was ruled against by the WTO in a set of cases in the mid 1990s, leading to the expiry of the Lome agreement and a new Cotonou agreement being signed in 2000. A key difference is that Lome had non-reciprocal agreements (ACP countries could export to the EU under trade preference agreements that did not apply to EU products exported to ACP countries) which were not allowed under the Cotonou agreement.

[7] McLeod and Leslie note that these are diseases that have the potential for rapid spread, have major public health and or socio-economic consequences and are of major importance in international trade. The list includes African Horse Sickness, African Swine Fever, Avian Influenza, Bluetongue, Contagious Bovine Pleuropneumonia, Exotic Newcastle Disease, Foot and Mouth Disease, Goat and Sheep Pox, Highly Pathogenic Avian Influenza (Fowl Plague), Hog Cholera, Lumpy Skin Disease, Newcastle Disease, Peste des Petits Ruminants, Rift Valley Fever, Rinderpest, Swine Vesicular Disease, Vesicular Stomatitis. Note however that the A list and the B list were merged in January 2005 on the list of notifiable diseases (Scoones and Wolmer, 2006).

response aims through veterinary service provision, research and development, control of livestock movements, and support to market infrastructure to create production and marketing conditions that meet OIE SPS standards.

An example of this approach is found in countries such as Namibia and Botswana. In these countries, veterinary fences divide the country into zones. For example, Botswana has divided the country into “EU zones”, “buffer zones” and “non-EU zones” determined by fences and control posts. Zones are defined by whether a FMD vaccination is required. The presence of wild buffalo is a key determinant as to whether a vaccination is necessary.[8] One drawback of this approach is the vulnerability it exposes a country to should a disease outbreak occur. One example of this is seen in the impact of a 1995 re-introduction of CBPP in Botswana. In response, 320,000 cattle were slaughtered at a cost of US$100 million, ‘with further indirect losses estimated at over US$400 million (Geering *et al.,* 1999)’ (Musisi et al., 2003), and the closure of the Maun abattoir until present (Jefferis, 2005). Another vulnerability is that disease free status can be changed, as illustrated by this announcement from the OIE’s web site: “Following the report of an FMD outbreak and vaccination in the recently OIE recognized "FMD free zone without vaccination" in Botswana, the status of the "FMD free zone without vaccination" in Botswana is suspended, with effect from 20 January 2003.” A country may make substantial investment into establishing a disease free zone but have this status revoked.

A different aspect is discussed by Meyn (2007) for Namibia and Botswana. She finds the loss of preferential access for Namibian livestock products to the EU market would ‘probably lead to the collapse of meat exports, with severe social consequences’ (p.1). She further notes that the loss of this market would undermine the infrastructure in place to allow disease free zones to exist. Even before 2007, the Botswana model was of questionable viability, as Jefferis reports in 2005 the Botswana Meat commission has been unprofitable for five of the last six years, has been consistently unable to meet its quota, and would be insolvent if not for government subsidies made possible by diamond revenues. The government finds itself in the unenviable position of subsidizing the export oriented meat industry while facing producer complaints of low prices and desire to sell in other markets that pay higher returns, notably South Africa. While it is technically possible that Ethiopia could follow the model of Botswana or Namibia by following a disease eradication program in large areas of the country that will be eligible to produce for export markets, it is hard to believe such an approach would be a wise use of Ethiopia’s resources given experiences elsewhere. We do not see the creation of ‘disease free zones,’ with their very high costs and implementation/management problems, as a strategy for improving livestock trade in Ethiopia during the next 10-15 years or so.

A variant of this approach is to comply with SPS requirements though the process by which meat is produced from livestock rather than the disease status in the regional origin of the livestock. This is the so-called ‘commodity-based’ approach to livestock trade, where the focus is on a safe product (in this case, meat) rather than a costly disease free environment for live animal production and export trade. It establishes a processing strategy that meets international export standards and thus

[8] This illustrates a tradeoff often experienced by countries – wildlife and the tourism revenue that can be obtained compared to establishing a disease free zone.

allows access to international markets. Rich et al. (2008) analyze the feasibility of a two stage SPS certification process for the Ethiopian livestock sector. The process they outline is as follows. "The system would first entail the pre-selection of animals in local markets, followed by the initial testing, vaccination, and quarantine of animals over a 21-day period in its first phase (Phase 1). In the second phase (Phase 2), quarantined animals from Phase 1 would then be finished in a feedlot system to bring them up to export weight (400 kg)." The phase one facilities are envisioned to process 130 head of cattle every 4 weeks and would be privately owned but overseen by a 'competent authority'. A Phase two feedlot would hold up to 5,000 head of cattle. They find that the breakeven price per ton needed to operate such a system is about $1,000 more than the cost of Brazilian and Indian meat currently available in the markets of Bahrain and Qatar. They argue that "…under current input prices, the proposed system is not economically feasible for exports targeted to Middle Eastern markets. However, the problem is primarily due to the current high cost of inputs, especially feed, and not the marginal costs of the SPS certification protocol, which are only 5% of the breakeven value of the final product."

The feed market has recently been analyzed in Ethiopia (Gebremedhin et al. 2009) and would appear to be an area where substantial research and development could lead to significant efficiency gains. We know from anecdotal information that it is growing in parts of Oromiya and Somali Regions without any NGO, donor, or government support, but we have little sense of how it operates, scale of operation, and other characteristics. Yet, gains in the feed sub-sector are likely to improve the efficiency of the markets closer to the terminal or export stage, but could indirectly increase the value of livestock produced in pastoral areas. If least cost rations can be identified and/ or designed, that could potentially make the two stage SPS certification process they identify economically viable in the future. Two final points can be made on this study. One, would be essentially creating a new market for cattle meat, as currently Ethiopia is almost exclusively an exporter of goat meat. Second, one possible benefit of this kind of effort is retention of the 'fifth-quarter' of slaughtered animals – that is all the non-meat by-products that can be used as inputs for other production processes.

Another perspective on the economic costs and benefits of disease control as related to export markets is provided by Nin Pratt et al (2005). In this study, they assess the impact of the Saudi Arabian bans in 1998 and 2000 on live animals from the Horn of Africa due to the Rift Valley Fever outbreak. They focus on the Somali region of Ethiopia. Taking into account the volume of the livestock produced in this region of Ethiopia and marketed though Somalia, they find the imposition of Saudi Arabia's ban on livestock imports led to an estimated decline of the region's GDP of 36%. They simulate an animal health program that would prevent future bans due to Rift Valley fever and finds it would pass a benefit cost test. However, one issue not addressed in the study is that the control of Rift Valley fever is an issue that would need to be addressed regionally rather than nationally. It is not entirely evident that efforts that establish control over the disease in Ethiopia would not still leave the country vulnerable to disease transmission though outbreak in other countries, or bans imposed on the whole region even if livestock are not affected in Ethiopia.

International Livestock Trade: Overseas and Regional Cross-Border

Another aspect of the Nin Pratt et al. report that we can turn to next is that their estimate of the cost of losing the export market due to the ban is based on the volume of animals exported though Berbera, Bosasso, and to a lesser extent Kismayo, Somalia. They report that '….Somaliland's total turnover for the year 1996, including also minor ports was 3.6 million heads and in 1997 more than 2.7 million heads were exported to Saudi Arabia and the Emirates." They estimate that live animal exports from the Somali region in a normal year are worth around US $ 44 million to Arab countries, $10 million to Kenya, and 19 million to the highlands of Ethiopia. In the event of the marketing ban they estimate a short run decline of the value of exports to Arab countries to $33 million in the short run and $13 million in the medium run. Aherns (1998) provides an estimate that between 60% and 80% of the livestock exported though Berbera comes from Ethiopia's Somali region. He writes "[a]ccording to information gathered from Ethiopian-Somali livestock traders and brokers, export fees in Berbera are, per head of sheep and goats US$ 3.50, cattle US$18 and per camel US $35. On the Ethiopian side, apparently only local municipal markets collect fees on every animal bought for sale."

Recent data provided by the Somaliland Chamber of Commerce, Industry and Agriculture for the livestock export markets of Hargeisa, Burao, and Tog Wajaale from May to September 2009 indicate revenue of US$9.5 million per month of which $7.9 is from exports. For a year, this is $114 million worth of revenue from total trade of which $95 million is from exports. It is not clear what share of this is from livestock produced in Ethiopia, but even a rough approximation of half for each country (which would be $57 million, roughly in line with Nin Pratt et al.'s $44 million estimate) indicates the huge volume of trade that is currently occurring from this area. We can build on this with some estimates of other cross border trade patterns in Ethiopia. Mahmoud (2003) estimated that 60 thousand head of cattle worth $9 million per year are produced in southern Ethiopia and exported to Kenya. Mulugeta et al. (2007) analyzed the cross border trade with Sudan. They find the volume of legal cattle export through the border town of Metema Yohannes to be 40,000 cattle in 2007. They estimate the illegal trade added to the legal trade to be around 100,000 head of cattle in this year. They find '[i]f the illegal cattle export could be shifted to the legal system, the total value of cattle export earnings would reach USD 30 million per annum in North Gondar zone alone. The major supply hinterlands to the legal exports are the highlands, contributing about 45% of the legal export volume…Lowland *woredas* are the highest supplying hinterlands to the illegal route contributing about 78% of the total illegal export volume" (p. v).

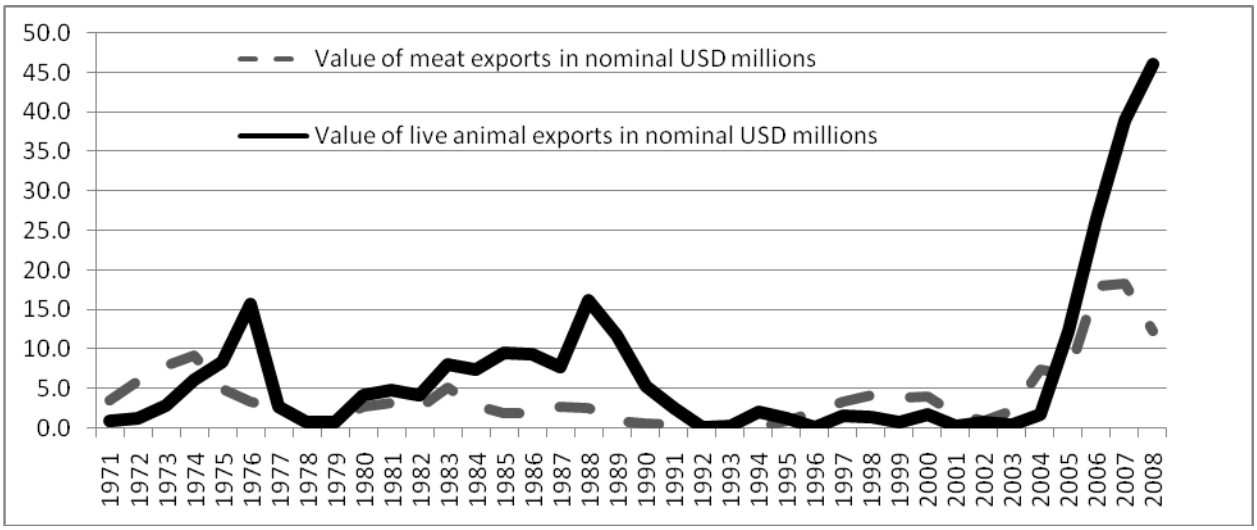
Other cross border routes where some volume of Ethiopian animals are likely to be traded are through Mandera towards Kenya and towards Kismayo in the south east and through Djibouti in the north. Representatives of the Livestock Marketing Authority (Hurissa and Eshetu 2002) estimated the value of unofficial trade in cattle, camels, and smallstock to be $105 million per year, and their estimate excluded trade along the border between Ethiopia and Sudan, which has grown rapidly following an agreement between Sudan and Ethiopia signed in 2003. As Halderman points out and what is not officially acknowledged is that 'if the value of the unofficial cross-border livestock trade is combined with that of the official trade in LLPs (Livestock and Livestock Products), the total value of exports of livestock and livestock products rivals that of coffee

(Halderman 2004:28)." The latter commodity has been Ethiopia's leading export product for many years.

FAO reports that in 2007, the largest commodity export from Ethiopia was green coffee worth $417 million. In 2006 the largest commodity export was coffee husks and hides and skins worth $354 million. In both years the second largest export was sesame seeds ($161 million in 2006, $133 million in 2007). ***Our estimates for the value of unofficial trade in livestock would put the value of unofficial trade in third place, and the combined value of livestock and livestock products would put livestock and livestock products as the second largest commodity group exported from Ethiopia.***

The legal trade has been growing rapidly as discussed in Report 1 of the this study. We here report for comparison to the figures just presented the value in millions of USD the official record of live animal exports and meat exports from 1970 to present.

Figure 1: Value of meat and live animal exports, 1971-2009



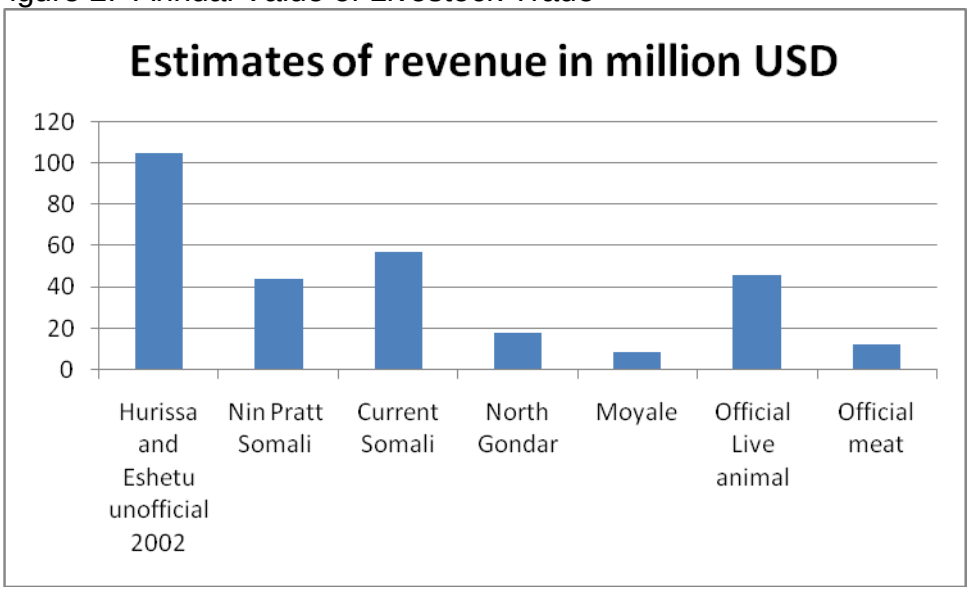
The composition of these various exports also merits attention. First, the official meat exports are largely composed of goat meat (92% for example of the tons of meat exported in 2004 were goat meat). Most of the official live animal exports are cattle (90% of Tropical Livestock Units in 2004, where 10 sheep and goats = 1 head of cattle). The exports through Somaliland ports are 26% cattle, 29% camels, and 45% shoat, this last category reportedly largely composed of fat tailed sheep. The exports from southern Ethiopia to Kenya and the exports to Sudan are reportedly largely composed of cattle, the main specie of livestock produced in these areas and the one in highest demand by importing countries.

To summarize the overall picture, we can refer to the following graph. The unofficial estimate by Hurissa and Eshetu is used as a conservative estimate of the value of unofficial trade. Contrasted against this are the two estimates of the value of animals produced in Ethiopia that transit via markets in Somaliland to be exported to the Arabian Peninsula, that of Nin Pratt et al. and the current estimate from the Somaliland trade data. We also present Mulugeta et al.'s estimate of the unofficial flow through

North Gondar to Sudan, and Mahmoud's for the flow of cattle from southern Ethiopia towards Kenya. The final two estimates take the 2008 figures from figure one for the value of official exports of live animal and meat.

Putting this all together leads one to the conclusion that the government of Ethiopia is missing a major opportunity to improve the well being of its citizens (see Figure 2). It has declared illegal trade in a legitimate commodity with the end result that the volume of illegal trade dominates the volume of legal trade, in some years by a factor of 50:1 or more. While Ethiopia has made great progress in fostering the legal trade in live animals and meat over the past decade, going forward it has a significant opportunity to address an untenable situation by providing means for aspects of the cross border live animal trade to be brought back into the legal economy. Research on different modalities for doing this is needed since it is a very sensitive issue

Figure 2. Annual Value of Livestock Trade



and it is important not to punish herders and livestock traders through punitive taxes and restrictions, which will only push the trade into other unofficial cross-border trade routes. ***To get a sense of the size of this trade, the estimate reported for the value of unofficial cross-border trade in the figure above is 25% (2007) and 30% (2006) of the value of coffee exports reported by FAO from Ethiopia. This is probably an understatement as some recent estimates have arrived at figures two to three times as large as the 2002 estimate for the current value of unofficial cross border trade.***

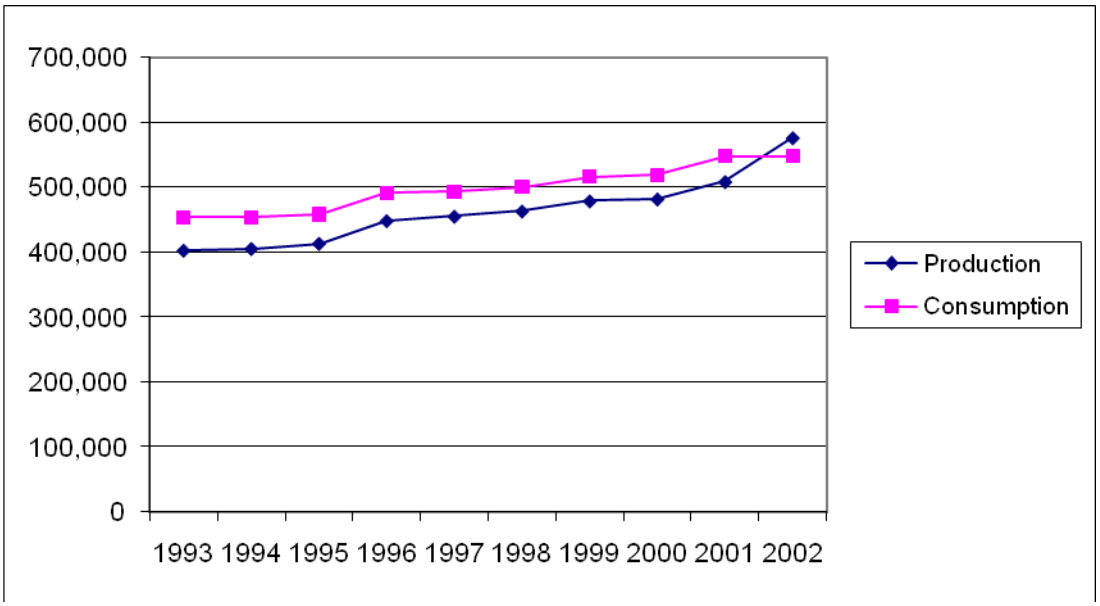
National Domestic Livestock Trade

One other major point remains to be made about livestock marketing. As Legese et al. (2008) note, "[t]here are three livestock marketing outlets in the country: the domestic channel, the formal live animal and meat export channel and the informal cross-border live animal trade" (p.21). Efforts to export animals and meet demand will be competing for these animals with the domestic consumers. They indicate that for cattle, the domestic market is generally supplied from animals produced in the

highlands, and the lowlands supply the export market. They cite an estimate by Belachew and Jemberu (2003) that 95% of the livestock that are exported originate in Borena, Afar, and Somali. Competition between domestic consumers and smallstock also is an issue noted by Legese et al, although they indicate this is reduced somewhat by the fact that exporters seek male animals while domestic consumers have a preference for female animals.

The overall domestic situation is reflected in the following figures. First, FAOSTAT estimates of total domestic production and consumption from 1993-2002 (the years for which estimates of both are provided) indicate that consumption levels and production levels are about the same in most years. For reference, recall that in our previous report we noted the volume of live animal and meat exports was 3,500 metric tons or less per year***. A striking fact of meat production and consumption that may be lost in the discussion of exports is that most of the meat produced in Ethiopia is eaten in Ethiopia. Looking into the future, Ethiopia will need to find ways to increase meat production to satisfy a growing population with rising incomes.*** A FAO report on Ethiopia's livestock sector (2004) indicates that meat production increased 1% per year from 1980-1993 and 1.3% per year form 1993-2000. For consumption, the estimates are 1.3% growth in both eras. Given population growth rates, these correspond to a declining per capita level of meat consumption – FAO statistics indicate it has decreased from 16 kg per capita per year to 12 kg per capita per year in 2000.

Figure 3. FAO STAT estimates of annual meat production and consumption in metric tons.



Aklilu, in a 2002 report, describes the domestic market as follows. "The terminal markets are located in large urban centers consisting of Addis Ababa, Dire Dawa, Dessie, Nazreth and the coffee growing regions of Sidama and Gideo. …Average volume of cattle brought to these markets may exceed over 1,000 head/week." (p. 34).

He goes on to describe in some detail the largest of these markets, the Addis Ababa area. "Available data for the period 1996/97 – 99/00[9] indicate that some 35-60,000 head of cattle are sold annually through the terminal markets of Addis. According to the same source, 65% of the cattle supplied to Addis terminal markets constitute fattened steers while the balance is composed of bullocks / oxen and to a limited extent barren cows. A 1999/2001 data indicates that Bale has been the major supplier of fattened steers to these terminal markets (about 38%) followed by Hararghe (29%), Borana (8.4%), Arsi (6.2%) and Wolayta (3.8%) (Aklilu 2002: 34)."

A report of the Kenyan livestock marketing system in 2003 noted the following. "It is of note that the current beef price in Nairobi is similar to the international price for beef. The 2003 price for manufactured cow beef from Australia c.i.f in the USA (wholesale, boneless) is about KSh 155/kg, as compare to the farm-gate equivalent price in Liakipia for boneless beef of KSh 153/kg. In addition, Kenya's cost levels are relatively high, due to the large transportation distances involved and infrastructure limitations, for example transport costs and the cold chain costs for chilled beef for export." (Agrisystems Ltd. 2003, p. 15). The study goes on to report that the Nairobi beef price and the Addis meat price are almost identical at around $1.60 per kilogram.

Moving from the value of animals in the domestic terminal market to the value in external markets, the Somaliland Chamber of Commerce reported the mean price of mature grade two export cattle in Tog Wajaale market from May to September of this year was $390. Using that as an approximation of the upper limit for animal prices, we can obtain comparative estimates for livestock prices in major livestock markets in Borana, Bale, East Harerge, and Metahara in 2006/7 that range from $210 to $235 per head of cattle (Teklewold et al. 2009b). Household level data collected in 2000-2002 for five sites in the Borana plateau indicates that producers received on average $61 per Tropical Livestock Unit, which is equivalent to one head of cattle (McPeak et al., 2009).

Teklewold *et al* (2009a) describe the live cattle export chain, where the producer's share of the final price, varying from 51 to 61%. The figures indicate that producer's share of final market price is higher with a shorter marketing chain (channel 1). Other channels are reported in the study, but we focus on the live cattle trade to compare with the information presented in the previous paragraph..

- The first channel consists of producers → big traders → exporters, where the producer's share of the final price is 61%.
- The second channel consists of producers → collectors → big traders → exporters, and the producer's share of the final price is 51%.
- The third channel consists of producers → small traders → big traders → exporters, where the producer's share is 52%.
- The fourth channel consists of producers → small traders → feedlot operators → exporters, and the producer's share is 58%.

Aklilu (2009) wrote in his background paper for this project that going forward, "The first important step is an attitudinal shift by policy makers to understand and appreciate the pastoral way of life and its contribution to the national economy…

[9] From City Administration Bureau of Agriculture

Ethiopia's pastoral areas cover more than half of the country and raise excess stocks of cattle, sheep, goats and camels, providing a guaranteed supply base for domestic and external markets in spite of the harsh environment. This is unrivalled by any other livestock production system in Ethiopia - a fact policy makers need to understand." He suggests that we seriously consider how to harness the benefits of cross-border livestock trade and create a pathway to bring the illegal exports into the legal system. Rather than prohibition and suppression, the government needs to harness the energy of this massive economic activity and find ways to make it work more efficiently.

One alternative to bringing the illegal cross border trade into legal status is improving prices and ease of marketing domestically by major investment in infrastructure, including additional customs and banking facilities on the borders, and subsidies, which would be hugely expensive and of questionable sustainability. Even if a trader on the Ethiopia/Kenya border wanted to officially export livestock, there is only one town, Moyale, over several hundred kilometers of borderlands that even has banking facilities and a customs post to allow official exports. The same is true for the Ethiopia/Sudan border. Aklilu further notes that "[h]arassment and confiscation, without providing alternative options, will only result in alienating further the population that live in border areas where central influence is already weak by virtue of distance and remoteness (ibid)." Programs such as EXCELLEX discussed in the retrospective study (Little et al. 2009) and creating more capacity in markets like Metema Yohannes are steps the government could take to support cross border trade. Government involvement in supporting this trade would justify taxation (even partial) of it, which could be a major source of revenue (though we would note that the government does benefit from the taxes on consumer goods purchased with the proceeds of sales and from taxes on animals sold at domestic markets prior to crossing the border) that could be used to support development efforts in the country. Nin Pratt et al. (2004) present alternative taxation scenarios to illustrate how the cost of veterinary services that allow export can be more than paid for by imposing sales and export taxes on live animal exports. However, as we indicated earlier, further research on this, especially the benefits/costs to different actors in the system (e.g., herders and small-scale traders) and the modalities of financing and streamlining export requirements, is sorely needed.

Aklilu further develops the theme that export marketing and veterinary services are linked concepts as he also writes in his brief that "[t]here is a need to revamp the veterinary service system both at the federal, regional and local level. To get a credible recognition of the Ethiopian veterinary service system by importing countries (the failure of which has led to recurring bans), regional veterinary service offices need to report technically to the federal Animal and Plant Health Regulatory Directorate while remaining administratively within the Regions (as is the case in all countries including in the federal system of Sudan) (also see section on Veterinary Services later in the report). This is key to setting up a credible SPS system at the national level to satisfy the requirements of current and future importing countries. Secondly, to reduce morbidity, mortality and abortion in pastoral areas, a system should be devised that ensures the uninterrupted supply of drugs and appropriate equipment through Regional, Zonal and *Woreda* offices on loan and/or cash payments to thousands of community based animal health workers that are already trained or to be trained in the future. Of note, it is the pastoral areas that suffer most whenever bans are imposed."

As argued by Scoones and Wolmer, the government needs to make some policy choices about what are the priorities and objectives in this area. If the objective is to reduce poverty or increase domestic production, veterinary efforts may target issues like Newcastle disease or parasites. If the objective is to control OIE A-list diseases, then targeting FMD and other related diseases is the proper area to target. Of course, one would ideally like to do both, but with limited funds, strategic choices must be made.

A similar theme emerges when considering the development of the export market if it comes at the expense of domestic consumers. Increasing the flow of animals into meat exports or live animal exports will lead to price increases in the domestic meat market if supply is not expanding as rapidly as combined domestic and export demand. This will combine with increased demand for meat brought about by income effects should economic growth continue, population growth, and the already existing trend of declining meat consumption per capita. We would argue that an explicit goal of government policy should be to expand production for domestic as well as international markets. This, again, can come about in three ways; larger herds, higher offtake rates from given herds, or more production per animal. The veterinary and feed improvements should not only be oriented towards export markets, but also for enhancing domestic market performance. Legese et al. motivate their study as follows: "[t]he Ethiopian live animal and meat export marketing system is operating in an environment characterized by several constraints that needs the attention and action of the government and other non-governmental development organizations. Despite the reported high livestock population of the country, the major meat and live animal exporters are complaining of shortage of supply and inferior quality of animals (especially shoats). The problem could be because of the constraints in the marketing system of exporters themselves, the market information system, poor market infrastructures like road, seasonality in production, competition of the domestic and the export sector, problems in the production system, or a combination of several factors."(viii) Going forward, we need a better sense of the relative importance of each of these constraints and what actions are feasible to address them.

Hides and skins

Hides and skins exports have historically been a major export category for Ethiopia, but there is no recorded data on hides and skins trade from pastoral areas (Aklilu 2009). Overall hides and skins trade was second in value to coffee exports throughout most of the 1980s and 1990s, but has declined vis-à-vis other products and in absolute terms. For example, during 2008 the value of meat and live animal exports actually exceeded revenues from hides and skins exports for the first time since export records were kept (ibid). At present it is estimated that about 25 percent of tradable hides and skins originate from pastoral areas, with most of these coming as by-products from slaughter houses. It is estimated that for 2008 approximately 750,000 skins originated from the export abattoirs alone (ibid). As a percentage, the sale of hides and skins contribute only a very small percentage of household income for pastoralists (probably < 1 or 2 percent) and we do not anticipate this will change significantly in the near-to-medium term.

Milk Production and Trade

As noted in our retrospective report, milk accounts for the largest single source of income for most pastoral households, but the vast bulk of it is consumed within the household, with little ending up on the market. For example, in terms of milk marketing in pastoral lowlands and its prospects for the future, it is almost entirely in the informal sector and linked to local pastoral towns and settlements. We have no evidence that milk market chains between lowlands and major highland cities (for example, Addis Ababa) are well developed and most milk in urban highland centers comes from small-scale urban and peri-urban producers in the highlands (see Francesoni et al. 2010). At present there are periods of surplus production during the rains but only a small percentage is preserved as cheese or ghee, with most of it consumed fresh or left for calves. There is some anecdotal evidence that a potential export market in the Middle East for camel milk exists and that some products are sourced from Somali Region, Ethiopia and air shipped to the Middle East (personal communication with Andy Catley, November 3, 2009), Aklilu (2009) also sees a potential for developing camel products further: "Support and encourage the private sector to process UHT camel milk and cheese and the extraction of honey for domestic consumption or export. The market potential of these two products has never been fully recognized, despite a surplus production of milk and honey in pastoral areas." With the growth of small towns in pastoral regions, we envision that local milk marketing will increasingly develop over the next 10-15 years but mainly will be geared to supplying consumers in lowland towns and settlements.

LIVESTOCK-BASED SERVICES AND INPUTS

The two key inputs that will continue to have an important impact on pastoral economies in the future are: (1) veterinary services and (2) feed supply. These have been mentioned above but will be examined in more detail in this section.

Veterinary Services

Veterinary service in pastoral areas is inadequate and considerably poorer than in highland and other areas of Ethiopia. The main veterinary service provider in pastoral areas is the government (public service provider) and it is extremely overextended and poorly funded and, thus, covers only a small proportion of the rangelands. Inconsistencies in policies and their implementation have led to both government and private sector delivering clinical services in the same pastoral areas, forcing the few private providers to struggle to sustain their operations (Silkin 2005). Indeed, the role of the private sector is at infant stage and manly practiced in and around large urban centers. At zonal and district levels private veterinary service is almost non existent and where it exists, it is limited to small veterinary shops only selling veterinary drugs and not other services.

Based on current trends as stipulated in the PASDEP document, there is likely to be an increase in animal health service coverage; establishment of additional clinics and mobile service delivery units; deployment of additional trained CAHWs; and increases in the supply and quality of vaccines. More efforts also are likely to address the control and prevention of trans-boundary animal diseases (foot and mouth disease, contagious bovine pleuro pneumonia, peste des petit ruminants, contagious caprine pleuro pneumonia, and African horse sickness) through vaccination and surveillance

programs. Progress has been made in infrastructure development particularly in establishment of regional laboratories in Afar, Benshangul, Somali, and Gambellea. The national veterinary institute is striving to improve the supply and quality of vaccines by significantly expanding the production of the 16 types of vaccines. The annual production of dosages for the 16 type of vaccines is expected to increase from 48,650,000 to 950,700,000 doses during the next decade (see the PASDEP document). The diagnostic service laboratory in Sebeta is now fully operational.

In terms of veterinary services, Catley (2009) points out that pastoralists generally are willing to pay commercial rates for primary veterinary care. He goes on to show that they also are well aware of the benefits/costs of disease prevention and treatment and carefully weigh these against the market value of the animal. For Catley the key delivery issues in these areas are accessibility and availability of services, rather than affordability. While in the past veterinary services were exclusively a government concern, their future delivery will involve new forms of collaboration between the public and private sectors, including NGOs.

As noted earlier, to be able to support the meat export industry, disease control laboratories and facilities need to be established, especially where abattoirs are located. Initial steps along these lines have been taken by the government, with a laboratory planned for a location central to the export abattoirs located within 45-60 km radius of Addis Ababa. To assist the animal export sub-sector, quarantine stations and animal health certification needs to be strengthened. Despite gains in vaccine production, there still is a strong need to increase the volume of vaccines, especially against CCPP that threatens chilled goat meat exports--the key animal product exported to the Middle East.

The training of veterinarians in Ethiopia has expanded considerably in the past 10 years and the trend is likely to continue in the foreseeable future. In the past the Debre Zeit veterinary faculty of Addis Ababa University was the only institute for veterinarian training, but today there are over 6 universities with established veterinary faculties for training veterinarians and the number of graduates has greatly increased. Building capacity in this area is vital for the future development of the pastoral livestock sector. However, in the immediate future continued training of para-vets or community animal health workers (CAHWs) is likely to have the most immediate impact on animal health in pastoral areas.

Feed Industry and Supply

The feed industry is especially important in pastoral areas for two reasons: (1) it supports weight gain for the live animal and meat export trade, which as noted earlier mainly originates from pastoral areas; and (2) it can help pastoralists in managing and coping with droughts (see discussion later in report). In the pastoral rangelands of Ethiopia, however, more than 95% of the feed resource comes from natural pasture with some crop residues in some localities. Nationwide, including the highlands, the amount of feed coming from improved (introduced or indigenous) fodder species account for <1% (CSA, 2005/06). Similarly, the contribution of industrial by-products is very negligible, i.e., <1% (LDMPS, 2006). For both of these feed categories production currently is increasing but it is still very low and of poor quality (for example, one source estimated that total animal feed produced by feed companies is only about 500 tons per annum for the entire country, interview notes, November 5, 2009). As a point of

comparison, estimated production of cattle feed alone in Kenya was 102,640 metric tons in 1997 (Kenya 2001: 4) or more than 100 times the amount of commercial feed produced in Ethiopia during the mid-2000s.

The feed industry in Ethiopia is underdeveloped in terms of the volume of production, marketing, and the types of feed processed, in part because Ethiopia is not a surplus grain producer. The feed types produced are: flour milling by-products; oil cakes, including by- products of cotton plantations and ginneries; brewery and winery by-products; by-products from sugar factories, such as molasses, bagasse and cane tops; and meat/bone meal[10] (abattoir by-products). At present there are 15 private companies in Ethiopia producing feed with most of it coming from wheat bran and other agricultural by-products and the quality is poor. Only near large cities are there well developed markets for feed, with the ultimate buyers of being commercial livestock producers, small-scale urban or peri-urban livestock producers, and cart horse and donkey owners.

Commercial livestock operators' main sources of feed may be broadly grouped into two on the basis of their products and feeds utilized: (1) those producing milk who depend on hay, bran and middlings, oil cakes, green fodder, beer waste, and (2) those producing meat/eggs who rely on straw, bran/middings, oil cakes, molasses, pulse offal, poulty litter, and minor quantities of fodder crops (LDMPS, 2006). Some rural farmers in the vicinity of urban centers have also started buying concentrate for their animals due to shortages of alternative feeds and increased awareness of the importance of supplementing their animals with concentrate (Adugna, 2007).

A brief look at how the feed industry in the country is likely to evolve over the next 15-20 years reveals that:

- With few exceptions, the available grazing lands in the highlands of Ethiopia will diminish leading to a stall-type feeding or /zero-grazing system for animals.
- Increased production of crop residues and agro-industrial by-products will result from a growth in agricultural and food processing schemes, which provide additional potential animal feed sources.
- There will be increased utilization of improved forage owing to the increased awareness on the importance of these feeds and the decline in the availability of natural grazing.
- In the pastoral areas, the size of available grazing lands will decline (due to various reasons) and crop residue use will increase. However, the use of agro-industrial by-products (AIPB) as animal feed will remain very low.

There are constraints to the development of the feed industry and adopting a long term view is required. This means acknowledging such challenges as: (1) prevalence of small land holdings (in most instances, 2 hectares or less) and dwindling natural pasture/traditional grazing areas due to non-pastoral activities); (2) poor extension services in pastoral and agro-pastoral areas; (3) shortage of improved livestock feeding technologies and limited use of irrigation for fodder production; (4) shortage of feed supply and affordability (particularly the high energy/high protein

[10] The use of these in livestock feeding has been banned to reduce the risk of disease transfer. This has significantly affected the poultry industry because substitution had to be made through importation of soybean meal from India at nearly three times the cost of meat/bone meal (LDMP, 2006).

supplements and other feed resources, vis-à-vis the smallholders and the pastoralists financial circumstances-purchase and cartage costs are often high); (5) uneven distribution of flour mills and agro-industrial food oil extracting enterprises in the country, including sugar states, and slaughter houses--most of these are in close proximity to a few major towns; and (6) the export of hay and other feed by-products export to neighboring countries (especially Djibouti) is creating a shortage of feed.

Species Conservation, including increased role of camels

Ethiopian pastoralists possess local breeds of livestock that are very well adapted to the local environment. Some are especially well adapted to harsh conditions of high heat, water shortages, fodder scarcity and endemic animal diseases. Opportunities to work with local communities to improve their livelihoods and security through enhancing local breeds have not been given adequate attention by government and development agencies. There is an opportunity to bring about improvement in the local breeds through selection, better feeding and management including reducing young mortality and controlling animal diseases. There, however, are indications that local valuable breeds, including the Borana cattle specie, are under threat from inter-breeding, thus deviating from its original valued characteristics (Nigatu et al 2002; Gebru et al 2003; Nigatu et al 2003). Preventing further genetic losses and conserving local breeds should be an important goal for the next 15-20 years, both in terms of insuring local food security and adapting to variable environments and climatic regimes. Under semi-arid and arid conditions there are very limited opportunities for pastoralists to cross breed their animals with exotic breeds. Cross breeds often have higher production potential but are poorly adapted to local climate, disease, and management conditions.

There is an obvious trend in parts of southern Ethiopia and elsewhere in the country of a shift from keeping cattle to camel and goat species. The primary driving forces are the severity of drought and its frequency and a change in vegetation toward browse species. One Borana pastoralist explained to us that a “camel is able to survive two consecutive droughts, and can provide milk equivalent to five cows.” We expect the trend of keeping more camels and goats to continue over the next 15 years, especially in the drier rangelands. Camel marketing (domestic and export) is also beginning to grow, and new camel butcher-houses are emerging in pastoral areas. Addis is also catering camel milk sales for the sizable Somali community.

There are positive developments towards promoting camel: The Haramaya University is the National Coordinator for Camel Research, and it has also established the Institute for pastoral and Agro-pastoral Research (IPAS) with the support of the Dutch government. Another recent development is the establishment of the Gode

Camel Research and Development Center (GCRDC)[11] in Somali regional state, and the Camel Forum Ethiopia[12].

DROUGHT CYCLE MANAGEMENT

During each drought the pastoral sector loses millions of dollars of value in animal deaths and low animal productivity. While periodic drought is a normal, predictable event in most lowland areas, governments usually treat it as an abnormality and do not include it in on-going planning and budget processes. As stressed by Abebe (2009) in his background paper, drought cycle management requires a few key pieces to be in place to be effective. One, there needs to be an effective early warning system. Ethiopia has long had this piece in place. This has been housed in a variety of different institutions, the Relief and Rehabilitation Commission (RRC), the Disaster Prevention and Preparedness Agency (DPPA), the Disaster Prevention and Preparedness Commission (DPPC), and currently in the Ministry of Agriculture and Rural Development (MoARD). Sandford (2002) was able to count 33 different early warning and food security surveillance systems implemented by various institutions at that point in time. FEWS also currently provides an early warning system.

Second, there needs to be a plan for what actions will be taken in the event that a warning of a drought is issued. Ethiopia has worked towards this goal. Abebe writes that the "…Ethiopian National Policy for Disaster, Preparedness and Management stated that each *woreda* should prepare a drought action plan which would describe interventions to save livestock, including supply of feed and water, veterinary inputs, livestock purchase centers and mobile abattoirs (Government of Ethiopia, 1993)" and that the "… MoARD had developed a 'National Guidelines for Livestock Relief Interventions in Pastoral Areas of Ethiopia' (MoARD, 2008)." His paper makes it clear that the local planning and implementation step of this process remains problematic. Going forward, this is one area the government can work with donors and communities to design plans that can be implemented in the case of a drought. It can also insure that drought contingency funds are made a part of the normal budgeting process and can be released in a timely fashion at the first signs of drought onset. This will allow governments and their partners to respond quickly before massive losses to herds and livelihoods. The latter scenario often is the case because drought- based interventions usually are delayed by international appeals for aid so that early livelihoods-based interventions are not possible.

The steps that can be taken in response to a drought warning fall into different categories. One, the most commonly encountered historically, is humanitarian food aid. Emergency distribution of relief food obtained through bilateral and multilateral assistance has been a recurring theme in sub-Saharan Africa, including Ethiopia.

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[11] The Somali Region Pastoral and Agro-Pastoral Research Institute (SoRPARI) established the Gode Camel Research and Development Center (GCRDC). It aims to works towards developing strategic method of upgrading camel husbandry, with research priority themes in camel health, nutrition, breeding and reproduction, marketing and processing of products and management.

[12] The Camel forum Ethiopia (CFE) was established in Ethiopia in 2009. It is a forum consisting of camel herders, regional and federal government Ministry of Agriculture and Rural Development, universities, research centers, NGOs, and FAO. It has a steering committee consisting of government and non-government organizations, and is chaired by the Plant and Animal Regulatory Directorate within the MoARD. The forum establishment was supported by MoARD, FAO, SAVE the Children USA, and CARE, VSF-Suiss. CFE works closely with the Kenya Camel Forum.

Variations within the distribution of relief food are distribution to the entire population, distribution targeted at the poor and vulnerable, food for work, and food aid for displaced persons.

Another category of responses has been growing in prominence in response to increasing frustration with the lack of any long term positive impact, and concerns about negative impacts of relief food distribution. An example relevant to the livestock producing areas of Ethiopia is provided by the Livestock Emergency Guidelines and Standards (LEGS) approach (2009). This outlines steps that can be taken to support livelihoods in the event of a drought. A set of actions that support livestock production systems are: destocking, veterinary services, feed supplies, water supplies, livestock shelter and resettlement, and provision of livestock after the drought. The LEGS approach can be used to develop a plan for a set of actions *ex ante* that will be triggered when different levels of the crisis are reached.

There has been a great deal of recent innovation and experimentation in this field that illustrate this approach. Aklilu and Wekesa (2002) provide an overview of the various programs that were undertaken in the 1999-2000 drought in Kenya. These range from destocking by subsidizing transport in markets, destocking by purchasing animals directly for distribution as meat, restocking after the drought had ended, providing supplemental feeding, supporting cross border peace initiatives, and veterinary care. These took place under the supervision of multiple donors and in multiple communities and were adapting in given communities over time as conditions changed. These activities had a variety of outcomes discussed in Aklilu and Wekesa's report, but all shared a common idea of supporting livelihoods in a drought as an alternative to provision of relief.

The Pastoral Livelihoods Initiative (PLI) adopted this approach in its drought assistance program in 2005/6 in Borana and Afar. It released a study in 2007 that documented their finding that it was much less costly to keep animals alive in a drought though supplemental feeding than it was to replace them through restocking after a drought. In Afar, they found restocking sheep and goats was 6.5 times as costly as keeping them alive with supplemental feeds, and for cattle the ratio was 14:1.
Another emerging opportunity for the future is the commercial livestock insurance. ILRI is coordinating a project in Kenya that is piloting index based livestock insurance for pastoral areas. This is commercially available insurance that pays out based on satellite imagery of vegetation greenness (NDVI measures). This gets around the monitoring and verification problems that confront insurance of individual animals – the insurance is against drought conditions that historically have led to animal deaths. It is run by private insurance companies and is a product that producers purchase of their own volition. The role of donors and government is largely to fund the design of the program and the extension effort to inform potential purchasers how this product works. Two main benefits are envisioned. One, by providing asset protection through insurance, it is hoped that the flow of households into long term poverty resulting from livestock losses in a drought can be reduced or even halted. Two, by turning livestock into insured assets, the potential is created that they can be used as collateral to spur investment.

One other approach taking place that merits note is the productive safety net, which is likely to be increasingly important in the next decade. DFiD has been active in

Ethiopia and is launching a version of this approach in northern Kenya. Regular cash transfers are given to households through this program. There is wide variation in how these programs are designed across countries. They vary from unconditional cash transfers, conditional cash transfers (one must show that children are sent to school, visit a health center, participate in public good provision such as tree planting or road construction), conditional or unconditional mixed food and cash transfers, or employment guarantee programs. In addition, these vary in targeting methods, where in some cases the elderly are targeted as in a pension scheme, others base it on household demography using a measure such as a dependency ratio, others use community based assessments of who is most deserving of assistance, and others rely on people to self select into the pool of the eligible by undertaking some kind of action or activity. These programs have two main core objectives. One is to reduce poverty immediately and the other is to create a long term pathway out of poverty for households. Evaluation is ongoing to see how these programs accomplish these two objectives, and whether there are any lessons to be learned in how the design of the program influences the outcomes.

THE ECONOMIC IMPACTS OF CONFLICT AND INSECURITY

Conflict especially disrupts herd movements and efficient use of rangelands, rational settlement and migration patterns, and sustainable trade. The Somali Region which depends heavily on cross-border trade not just for the sale of animals but also imports of food stuffs through Somali ports is a pastoral region that has been especially devastated by conflict (see earlier discussion). For the past 4 years the conflict in Somalia and the associated concern by government with controlling border trade has greatly affected pastoral welfare and food security in the region. It is noted that almost 50 percent of the region's population is in need of food assistance and that after drought conflict is the main source of pastoral vulnerability in the region (see Devereux 2006).

In terms of its economic impacts, conflict and insecurity has two general impacts. First, is the way that it distorts grazing and settlement patterns forcing large expanses of rangelands to be left vacant, especially in border zones between Regional States (for example, the disputed lands between Regions 4 and 5), and forcing conflict-displaced populations into small towns and settlements. The latter often stretches the capacity of settlements to support excess populations, leaving many destitute and with minimal future prospects (note the large number of IDPs in towns of Somali Region). A second general effect of conflict is on trade (and directly on food security) and this has been a special problem in the Somali Region. In this case, the government has responded to conflict in the area by virtually closing critical border markets and trans-border trade in livestock and food imports. The latter creates severe food shortages and high prices for pastoral consumers, while the loss of livestock markets in the region cripples local and regional incomes. Although unrelated to conflict, it is estimated that the quarantine on cross-border trade in Somali Region due to fears of RVF resulted in loss of ¼ of regional GDP or about 91 million dollars (Pratt et al. 2005:3).

Other ways that conflict damages pastoral areas is by closing livestock markets for several months at a time and constricting trade within certain groups and territories, both constraints distort prices both for traders and producers. Again, referring to the Somali Region, conflict between different clan-based factions and militias has meant

that herders are restricted to selling their animals within specific trade corridors defined by membership in a particular clan, regardless of what the price is like in other trade corridors. Umar and Baulch document numerous examples where Somali pastoralists were unable to sell at higher-priced livestock markets within the region because of on-going conflicts between different political factions, depriving the producer of income and distorting price relations in the region (Umar and Baulch 2007).

We anticipate that conflicts over land and water will increase in the future unless the government takes the kinds of policy steps outlined earlier that recognize pastoral rights to key resources, empower local organizations and communities to regulate the use of their own resources, and detracts outside investors and other interests from monopolizing valued river valleys, water points, and other significant assets.

CONCLUSIONS

This report has shown the important contributions of pastoralism to Ethiopia's national economy and development, including its export earnings, local incomes and consumption, and its linkages to other sectors. We have argued that four key sets of issues and trade-offs are key to sustaining and improving pastoral economies in the future: (1) irrigation and other land uses versus pastoralism; (2) land tenure and the importance of mobility and flexibility; (3) settlement and the issues associated with pastoral sedentarization; and (4) trade and especially the question of overseas export versus regional/unofficial cross-border and domestic marketing. Particularly important will be the degree to which pastoral communities are allowed to control their own land and resources and to pursue their most profitable trade channels. Conflict, governance, and education also are critically important, often in complicated ways, and will shape future scenarios in pastoral areas.

The most important findings of the report include:

- ***Mobility of livestock herds must be maintained and secured to increase economic benefits and tradable products and to take advantage of Ethiopia's vast rangelands and environmental variability. Mobility is an efficient practice for rangeland economies and remains important to the livestock industries of developed economies, including the USA, Australia, and Spain;***
- ***Land and legislation reforms that recognize pastoralists' rights to their own lands and resources are necessary to continue and increase the production of valuable animals and animal products and to reduce conflict and insecurity. The feasibility of some form of land certification, probably on a community or group basis, in the pastoral areas that would secure local land rights should be considered. Research on different land registration/tenure models that would work in Ethiopia's pastoral areas is sorely needed at present ;***
- ***Loss of access to critical dry season grazing and watering zones, such as key riverine zones, makes other lands less productive and jeopardizes the entire pastoral economy and the export trade and other economic activities***

that depend on it. Large-scale irrigation in riverine areas, which is very expensive and subsidized, is a key threat to the sustainability of pastoral economies since without seasonal access to them pastoral economies in many parts of the country would collapse. It is important that policy makers are aware of the full range of economic benefits, including trade, that will be lost with the continued conversion of riverine areas to non-pastoral uses;

- ***Settlement policies must take into account the importance of maintaining mobility but also dealing with growing human populations who have been forced out of pastoralism through drought or other shocks or by choice;***
- ***Our estimates of unofficial (cross-border) trade in livestock place it as the country's third largest export activity, and the combined value of livestock and livestock products would put livestock and livestock products (official and unofficial) as the second largest commodity group after coffee exported from Ethiopia.***
- ***To bring the illegal cross border trade into legal status would require improving prices and ease of marketing domestically through major investments in infrastructure, including additional customs and banking facilities on the borders, and subsidies. These actions would be hugely expensive, of questionable sustainability, and might only re-direct the trade to other unofficial channels. Currently traders in Ethiopia's border areas need to traverse several hundred kilometers of territory to officially export their animals because of the glaring lack of banking facilities and customs posts. Further research on this topic, especially the benefits/costs to different actors in the system (e.g., herders and small-scale traders) and the modalities of financing and streamlining export requirements, is sorely needed.***
- ***In terms of export trade, it probably is technically possible that Ethiopia could establish a disease eradication program in large areas of the country that would be eligible to produce for high-value export markets in Europe. However, it is hard to believe such an approach would be a wise use of Ethiopia's resources given experiences elsewhere in Africa. We do not see the creation of 'disease free zones,' with their very high costs and implementation/management problems, as a strategy for improving livestock trade in Ethiopia during the next 10-15 years. A 'commodity-based' approach that focuses on minimizing health risks of specific export products (i.e., meat) is a much better strategy and one which Ethiopia already has experience.***
- ***Official goals of increasing exports of animals and meat overlook the fact that most of the meat produced in Ethiopia is eaten in Ethiopia. Looking into the future, Ethiopia will need to find ways to increase meat production to satisfy a growing population with rising incomes. Any land use and land tenure changes that compromise pastoral production in the lowlands will jeopardize this objective, as well as goals of increasing livestock and meat exports.***

- ***Small and medium towns will continue to grow in pastoral areas and could be important foci for economic growth linking value-added industries with the livestock sector and stimulating regional development. The development of important value-added industries and enterprises in the pastoral sector is highly dependent on functioning towns and rural-urban linkages and we simply do not know enough about how they operate in pastoral areas to promote effective investment policies. Indeed, the whole area of rural-urban linkages and, particularly, the role of small towns in promoting pastoral economic growth and diversification are very poorly understood and shouts for additional investigation and research.***
- ***Unless sustained peace is instituted in pastoral regions, conflict will override most of the positive trends in pastoral ecdonomies and strongly shape future trajectories in pastoral areas;***

To conclude, we believe that the economic benefits from pastoralism and livestock-based industries are critically important for Ethiopia and that effective policies and investments are required to insure that this remains the case for the next 15-20 years. There simply are no other cost-effective and environmentally appropriate alternatives to mobile pastoralism for large parts of the country's lowlands.

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ANNEX I: A compendium of recent legislation to protect pastoral land rights in West Africa

Ced Hesse
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1. Legal recognition and protection of livestock mobility.

Mauritania

Art. 10. Pastoral mobility is protected under all circumstances and can only be limited temporarily and for reasons of the safety of animals and crops, and this in accordance with the provisions of the law.

Mali

Art. 4. While implementing their livestock keeping activities, herders have the right to move their animals in order to make use of pastoral resources.

Art 5. Livestock movements may be local, regional or across the whole national territory while \ respecting in every season all protected areas and animal sanitation requirements.

Art 14. Throughout the country, livestock may be moved for sedentary livestock keeping, transhumant livestock keeping or nomadic livestock keeping.

Art 15. Livestock movements take placer on pastoral routes. These are composed of local and transhumance routes.

Art 18. The use of pastoral routes is both a right and an obligation for all pastoralists. The obligation to use a pastoral route cannot be lifted during the crop growing season. However, local governments can, according to local realities, but without abrogating herders' responsibility in the event of their animals causing damage to the property of others, identify periods when the use of pastoral routes will be only recommended.

Art 22. Local government in collaboration with the competent traditional authorities, farmers' organisations and other stakeholders, particularly the local administration and technical services, establish in a concerted manner every year as necessary the timetable of transhumance. The timetable must determine the outer most dates for the departure and return of the animals from one locality to another.

Art 23. In the context of the policy of regional integration, the movement of Malian livestock herds for international transhumance to neighbouring countries is authorised….. Similarly, the entry and movement of herds from neighbouring countries on Mali's territory for the purpose of transhumance is authorised subject to reciprocity and according to bi-lateral and regional agreements linking Mali.

Art 52. Pastoral routes are part of the public domain of the State and local government and they must be classified.

Niger

Art 3. Mobility is a fundamental right of herders, pastoralists and transhumants. This right is recognised and guaranteed by the State and local government. Mobility constitutes a rational and sustainable use of pastoral resources and can only be limited temporarily and for reasons of the safety of animals, crops, forests and crops this in accordance with the provisions of the law……

In all the developed agricultural areas, land destined for grazing and the movement of livestock must be reserved. [This is referring to irrigated land along water courses.].

2. Legal protection of pastoral resources

Mauritania

Art. 11. Herders and their animals benefit, in all circumstances, apart for temporary limitation as provided in the preceding article, from free access to pastoral resources situated in areas other than those designed either provisionally or definitely for exclusive pastoral use, allocated to a third party according to the law in force. However, the herder is responsible for surveying his animals at night.

Art 15. No land will be leased in a pastoral area if it prevents herders from accessing pastoral resources.

Art 19. Regional land use plans will obligatorily determine those areas in every Wilaya (e.g. District) where sedentarisation is prohibited.

Art 25. No new activity will be authorised close to water points such as boreholes and wells declared for pastoral use in conformity with Article 22 above if it might have a negative impact on water discharge or animal access or change the land use system away from pastoralism.

Mali

Art 12. Development actions and projects must in their design and implementation recognize the need to preserve pastoral resources as essential components of pastoral livelihoods. In view of this, an environment impact assessment is required every time a project, a programme or a plan is susceptible to provoke the total or partial reduction or disappearance of pastoral resources.

Art 41. It is prohibited to prevent or limit access by animals to a public water point by fields, barriers or any other obstacle. Proprietors of land bordering public water points are obliged to ensure the passage of livestock for drinking.

Art 47. Pastoral areas and resources must be preserved and protected in the context of development programmes and projects. Every project and programme must take in account the needs of pastoral activities.

Niger
Art 5. Subject to provisions within the current law, all forms of exclusive appropriation of pastoral areas under the public domain of the State and local government is prohibited. In particular, no land may be leased if it constrains the mobility of herders and livestock as well as access to pastoral resources.

3. Legal recognition of customary land management based on the principle of nested rights of access to and control over resources rather than exclusive ownership rights to land.

Mali
Art 35. After harvest, livestock may graze fields. Resident livestock of the concerned local government have priority access.

Art 40. When natural water points are developed as pastoral water points, herders have priority rights of access. Access may be conditional on the payment of taxes.

Art 42. Traditional wells, private cement lined wells and private boreholes are the property of those that developed them. Their owners ensure their management. Access to these water points is subject to the getting prior agreement form their owners….

Art 44. Access to these wells [public cement lined wells] for pastoral use is open to all. However, resident herders in the local government where the well is located have priority access.

Niger
Art 11. Pastoralists can, at their request, benefit from a priority right of pastoral use of natural resources situated in their home area. The priority right of pastoral use does not prevent the implementation of customary rules of management and use of pastoral areas, in particular the third party access to water and the right of grazing.

The priority right of pastoral use is accorded in line with customary rules and practice that regulate the management of natural resources. It is recognised through a ruling by the president of the departmental land board [e.g. district-level].

Art 12. The priority right of pastoral use is a right of occupation, of exploitation and of management that is granted to pastoralists in their home areas.

In no cases can the exercise of the priority right of pastoral use constrain pastoral mobility or result in the exclusive control of pastoral resources. Pastoralists either as

individuals or collectively can only be deprived of their priority right of pastoral use in the public interest after just and prior indemnification.

4. Negotiation and consensus seeking using existing local institutions at different levels are the basis of conflict resolution.

Mauritania

Art 35. Conflicts that arise as a result of livestock damaging crops, or farmers injuring livestock are resolved in an amicable way by the two parties. If an amiable solution is not possible, the conflict is brought before a mediation commission composed of:

- At commune level: the Mayor of the Commune (Chair); one representative each from pastoral association, farmer association, each of the protagonists.

Conflicts not resolved at the Commune level are brought to the Moughataa level…

- At Moughataa level: the administrative authority (Chair); one representative each from pastoral association, farmer association, each of the protagonists.

Art 37. The mediation commissions judge the damage and decide the level and nature of recompense….

5. Legal recognition of pastoralism as a valid and productive form of land use.

Mali

Art 49. Productive pastoral land use is composed of regular and extended pastoral activity on public government and local government land accompanied by traditional and modern development activities and/or measures to preserve or restore the environment.

Art 50. The recognition of productive pastoral land use allows those herders that are concerned to benefit from the recognition, protection and guarantee of pastoral use in the concerned area. The recognition of these rights does not in any way imply a transfer of the ownership of the soil or resources.