



# Review of the literature on Pastoral Economics and Marketing:

## The Horn of Africa and Southern Africa

Report prepared for the World Initiative for Sustainable Pastoralism, IUCN EARO  
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## Introduction

This report takes the proverbial trip from the Cape to Cairo, pastoral style. For pastoral purposes we begin the journey in Somalia on the Horn of Africa and finish in the Republic of South Africa. Along the way we encounter both conceptual forests and conceptual trees.

The trees that might prevent us from seeing the forest are represented by individual Africa countries. With respect to livestock marketing and commercial involvement, each of the countries reviewed in this study is remarkably distinct. For example, the four major livestock producers and exporters in southern Africa – Botswana, Zimbabwe, Namibia and South Africa – differ one from another as a result of variations in climate, natural resource endowment, colonial history and current levels of national economic development. The country case studies in this report emphasize these differences.

But there is also a forest to report on, in the form of a single, overall pattern that emerges from the sub-continental breadth of this review. In terms of variations in the level and kind of pastoral commercial involvement, there is a clear regional difference between the Horn and southern Africa.

The national economies of Ethiopia and Somalia are poor, technologically underdeveloped, but integrated nonetheless into global capitalism. In terms of livestock exports, these countries produce relatively unprocessed raw commodities – hides, skins and live animals – for regional markets. Weak, non-existent or (from the perspective of livestock producers and traders) parasitic national governments do little to promote their livestock industries. Despite these constraints, pastoral households in Ethiopia and Somalia are increasingly involved in commercial livestock production for sale, with results that in the aggregate are impressive both in terms of the volume and value of international trade and foreign exchange earnings. In return, these pastoral households receive marketed commodities such as grain and clothing that are essential for their survival. Despite their remoteness and their participation in weak national economies, these are pastoral production systems oriented to commercial production.

The situation is different in southern Africa. Here strong and sometimes benign national governments support and occasionally subsidize their livestock producers. The export product range includes both processed commodities (such as chilled, boneless beef from Botswana) and sophisticated goods for international niche markets (such as Karakul pelts from Namibia for the fashion industry, or branded 'free range' meat from South Africa). The export trade is officially regulated, treaty-bound, technically advanced, and diverse in the geographical spread of its markets.

Despite living in comparatively advanced industrial economies, many livestock owning households in southern Africa are averse to routine market involvement. This paradox is sometimes explained in terms of pastoralists' 'attitudes', which are variously said to be conservative, traditional, or fixated on the accumulation of livestock wealth for purposes of prestige. The evidence assembled in this review provides an alternative economic explanation for restricted market participation by southern African pastoralists.

Many poorer farmers and herders in southern Africa obtain the bulk of their cash from non-agricultural sources – remittances from relatives, salaried employment, the informal economy, pensions or welfare. These poorer rural residents engage in agriculture not to make money but to save cash by producing for themselves food that they would otherwise need to purchase. This is an attractive strategy because of the different prices at which rural people can expect to buy and sell agricultural produce. Because of their relatively remote location, transport costs and poorly developed marketing systems, they can expect to buy food at inflated retail prices but routinely sell agricultural produce at deflated farm gate prices.

Pastoralists who actively seek commercial marketing opportunities do exist in southern Africa, for example among large Botswana cattle herd owners or among the Himba of north west Namibia (Behnke 1987; Bollig 2005). But for many smaller producers it makes good economic sense merely to provision their own families by their agricultural labour, to market windfall surpluses in good years or sell livestock capital in times of distress. Beyond this point, any additional family labour or capital is better deployed to secure off-farm or non-pastoral sources of cash that are more lucrative than producing regular agro-pastoral surpluses for sale. This pattern is exacerbated by southern Africa's colonial history. Smaller producers who

might otherwise aspire to regularly sell meat, milk or maize for profit must compete head-on against large, mechanized, well financed farms or ranches with privileged market access and secure land tenure arrangements – the heirs to southern Africa’s dualistic settler economy. Many smaller producers do not attempt to sell regularly into markets where prices are set by firms that achieve economies of scale far beyond the smallholder.

The contribution of pastoralism to national economies is therefore very different in the Horn and in southern Africa. In the Horn, pastoralism generates impressive amounts of foreign exchange and a significant contribution to GDP. Or it could be shown to do so if there was anyone around to enumerate these effects. In Somalia no one is counting because there is no national state and hence no national accounts. In Ethiopia no one is counting because government construes most international livestock trading as smuggling, which it refuses to countenance.

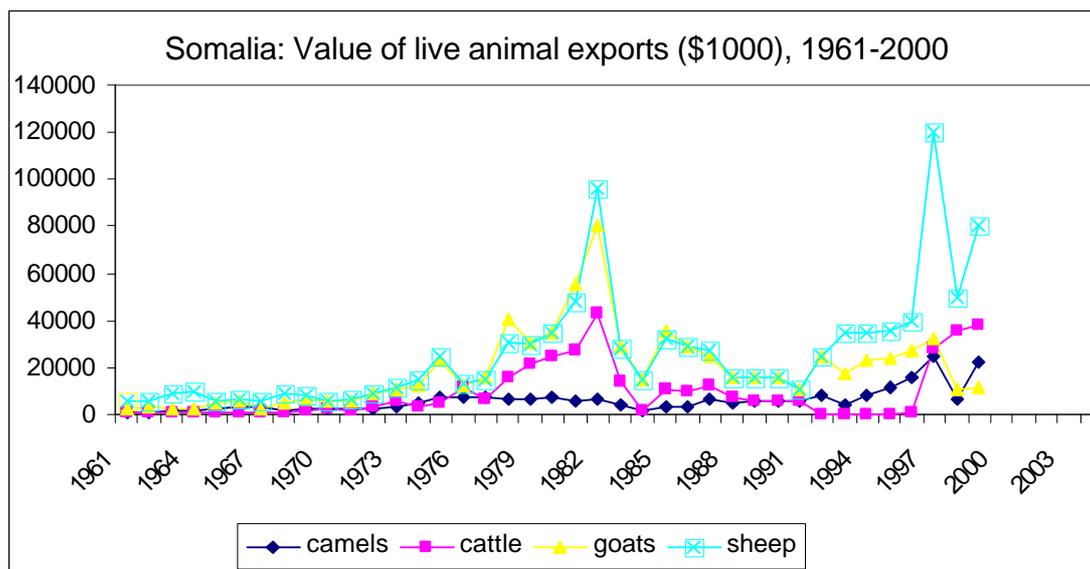
The situation is different in southern Africa. Here national accounts and agricultural statistics are conscientiously kept but do not capture many of the non-traded goods and services provided by pastoralism. For this information we must turn to specialized research studies, some of which are reviewed in this report.

### Somalia: livestock exports and food purchases

The territory that was once Somalia is pastoral country: Nearly 98% of the agricultural land is pasture (FAOSTAT), and out of a total population of over 9.7 million people, 7.4 million – or about three quarters of the population - live in semi-arid rangeland areas suitable only for livestock production (ILRI 2002: 24).

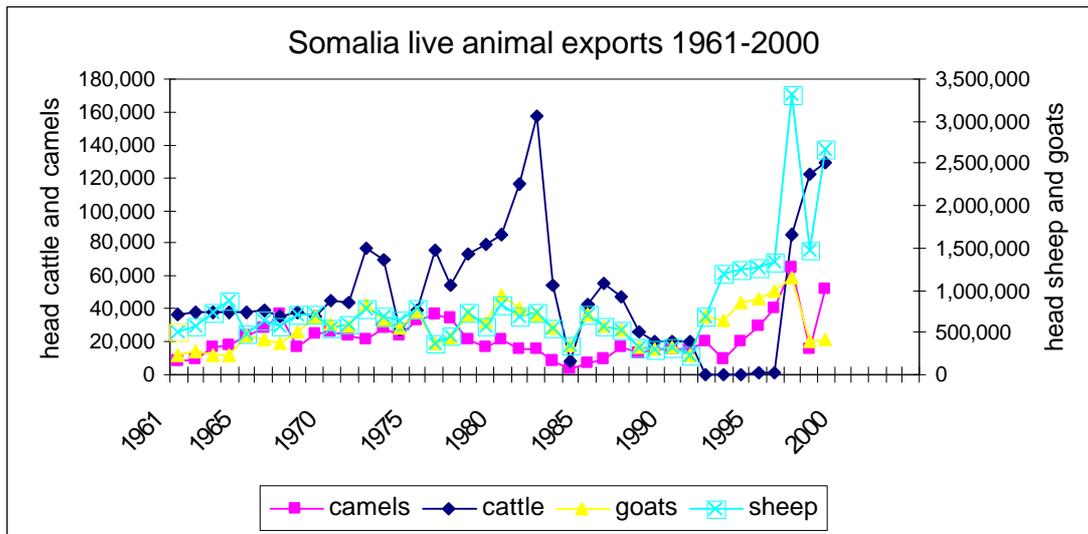
Somalia has had no central government since 1991 and the availability of national statistics on rangeland production and the livestock trade is uneven. FAOSTAT gives no livestock population estimates or production figures for the country but does provide statistics for the number and value of live animal exports, which are the most important form in which Somali livestock are exported. This data is summarized in Figures 1 and 2, which document sudden and high fluctuations in exports both when Somalia had a central government during the 1970s and 1980s and in the 1990s following the break-up of the state. Three factors explain these fluctuations: periodic severe droughts, veterinary restrictions by importing countries in the Persian Gulf, and insecurity and the disruption of trade routes within Somalia itself, especially since 1991. However, the number of animals exported and their value does not change markedly before and after 1991.

**Figure 1**



Source: FAOSTATS

**Figure 2**



Source: FAOSTATS

It is instructive to examine the Somali livestock export industry at different points in its volatile history. A short article by Reusse (1982) provides a capsule summary of developments up to about 1980. More recently, a series of publications by Peter Little and his colleagues (Little et al 2001, 2005; Little 2002, 2004 and 2005) analyses the situation from the late 1980s to the present.

### **Background: livestock exports before 1991**

The recorded involvement of Somali pastoralists in international trade went through three relatively distinct phases:

- In the early 19th century the northern Somali traded in exotic wild products (ivory, frankincense, ostrich feathers and gum Arabic) which were gathered by the nomads but were not actually pastoral produce.
- The pattern of trade changed and the volume of trade expanded when the British occupied Aden and the North Somali coast. Hides and skins (bound for the United States and Europe) came to dominate the trade, which also included slaughter animals (which supplied the British garrisons with meat), and clarified butter. Pastoral produce was now being sold, but the wide range of products indicates that the nomads were marketing the by-products and surpluses of a subsistence-oriented system of production.
- Specialized, single-commodity commercial pastoralism only arose in the 1950s with the oil boom in Saudi Arabia and among the Gulf States. In response to rising demands for red meat and slaughter animals for Islamic festivals associated with the Hajj to Mecca, the Somali began to supply these markets with large numbers of small ruminants, most of which left from the northern Somali port of Berbera destined for Jeddah in Saudi Arabia (Swift 1977: 285-87, 1979: 448, 449, 451. In addition to information on Somalia, Swift's 1979 article contains the first use of data on terms of trade to understand pastoral purchasing power and commercial involvement.)

It would be difficult to overestimate the magnitude of the Gulf trade in live animals and its importance to the national economy of Somalia. According to Reusse:

- In some years in the 1970s Berbera in northern Somalia was the world's number one livestock shipping point.
- Until the Australians shifted to live animal exports in the late 1970s and eroded Somalia's market share, Somalia was the world's major sheep and goat exporter.
- As late as 1976 Somali exports valued at point of shipping constituted one sixth by value of the world livestock exports (US\$ 340 million).

- About a third of total livestock off-take was for export, and a third of bank deposits in one northern Somali town (Burao) were from nomadic pastoralists (Reusse 1983).
- In 1981 live animal exports produced 91% of the country's hard currency (exclusive of remittances from workers living abroad) while the export of all animal products combined accounted for over 80% of Somalia's foreign exchange in five of the seven years between 1975 and 1981 (Holtzman 1982: 9).

## 1991 to the present

Since 1991 and the collapse of a centralized government, three cross-border trade routes have evolved. These are:

- The Kenya/southern Somalia border – focusing on long-distance, export cattle trade to Kenya, especially the Nairobi market
- The eastern Ethiopia/central Somalia border – based on local domestic trade in livestock and cereals
- The eastern Ethiopia/Somaliland border – dealing in small stock export and the importation of food and consumer items (Little 2002: 179).

There are several reasons why the livestock trade has been able to survive and expand despite the collapse of the state. Mubarak estimates that the pastoral sub-sector which generated more than 80% of annual exports received only 6% of public expenditure from 1974-88 (1997). Since they had received so little government support, herders suffered less disruption when state services were withdrawn (Little 2004). Moreover, pastoralists were mobile and could move away from conflict, and trekked trade livestock were less dependent upon the deteriorating road network than forms of trade that relied on mechanized transport to move goods to market.

Along the Kenya/southern Somalia border, cattle, consumer electronics and clothes are exported from Somalia which imports qat (a stimulant), maize, wheat flour, tea and sugar from Kenya. The livestock component of this trade involves 'medium to high quality male and female [cattle], which are used for slaughter in Kenya's major urban centres and for restocking and breeding purposes on commercial ranches in the Rift Valley' (Little 2002: 181). Cattle from the Mogadishu and Lower Shebelli regions are trekked long distances, in some cases more than 450 km. Aklilu (2002) estimates that this trade provides 26% of the beef consumed in Kenya; Little et al (2005) estimated that 16% of beef consumed in Nairobi was provided through this channel, or annually about 73,000 head of cattle, 75% of which end up in the terminal market of Nairobi (Little 2002: 184). Garissa market, the main entrepot for this trade route, generated over fifteen million US dollars in cattle sales alone in 1998 and was the largest cattle exchange in Kenya outside of the urban markets of Nairobi and Mombasa:

This amount of annual revenue compares favourably with some of Kenya's major coffee and cash crop-producing districts, a phenomenon that is rarely acknowledged in Kenya's official economic reports. Most policy directives generally undervalue and neglect the importance of the pastoral sector to the national economy because it is poorly understood and does not contribute much to the state's foreign exchange coffers (Little 2002: 185)

The eastern Ethiopia/central Somalia market route is centred on the western Somali town of Belet Weyne. Maize, sorghum, wheat flour, pasta and imported consumer goods flow into Ethiopia along this route, in return for coffee, goats and sheep, camels and kerosene from Ethiopia. The road linking Belet Weyne to Mogadishu is badly damaged, livestock prices are low, and much of the pre-1991 trade along this route has probably been redirected to other channels. Teka et al. (1999) nonetheless estimate that more than 50,000 head of Ethiopian livestock are informally exported to Kenya, often transiting through Somalia.

Goods traded along the eastern Ethiopia/Somaliland border include wheat flour, pasta, sugar and rice leaving Somaliland in return for sheep, goats, cattle, camels maize and charcoal from Ethiopia. Berbera and neighbouring ports are at the centre of this trade, which is destined for the Arab Gulf states. Little reports that the trade in sheep and goats out of Berbera at the end of the 1990s was larger than during the pre-1991 years (2002: 194), which were disrupted in the late 1980s by insecurity and a Saudi ban on Somali livestock imports. According to export figures for Somalia (including Somaliland), in 1998 Somalia accounted for 95% of all goat

exports and 52% of sheep exports for the eastern African region (Zaal and Poderman 2000: 17-18 cited in Little 2002); Somaliland was the regional centre for small ruminant exports. Since 50 to 60% of the small stock leaving Berbera originate in Ethiopia, this trade made an important contribution to the Ethiopian as well as the Somaliland economy.

### **Benefits of cross-border trade**

Little argues that cross-border trade is essential to regional food security, with the export of animals financing the importation of essential foodstuffs such as rice, wheat flour, cooking oil and pasta. When the export of animals declined or was interrupted, food supplies dwindled and became expensive (2002: 198-9). However, the contribution of cross-border trade to pastoral livelihoods was blunted by several constraints:

Although there exists a potential for cross-border trade to enhance food security in the pastoral areas of eastern Ethiopia borderlands, the distribution of the proceeds of livestock sales is biased in favour of non-pastoral agents due to weak spatial integration. Moreover, pastoralists face unfavourable terms of trade as a result of declining prices for their animals and rising prices of their major purchases. Therefore, to improve the food security situation in the area, broadening market access for both sales and purchases is required (Little et al. 2001: 23).

What was needed were more open, integrated and competitive markets. Instead, in government circles 'trans-border commerce often is still portrayed as smuggling and illegal and consequently remains subject to disruptive border closures and animal confiscations' (Little and Mahmoud 2005).

### **Ethiopia: selling and smuggling live animals, hides and skins**

The importance of pastoralism in Ethiopia depends on the criteria of assessment – land area, human population size or animal numbers. Pastoralists are a minority in Ethiopia. According to ILRI there are about five million people resident in Ethiopia's semi-arid rangeland areas, or about 8% of the total national population (ILRI 2002). However, this pastoral population occupies a disproportionately large area and produces much more than its share of national livestock output. According to FAO figures, pastures constitute 63% of the agricultural land area in Ethiopia, while the Ethiopian Ministry of Agriculture estimates that pastoralists use 60% of the land area of the country, but own 73% of the nation's goats, 25% of the sheep, 20% of the cattle and the entire camel population (Aklilu 2002: 33).

Ethiopia probably has the second largest ruminant population in Africa, after Sudan, though Ethiopian livestock statistics are at best approximations:

*'Livestock population figures are based on estimates....Ethiopia has been using a constant figure for nearly thirty years before allowing annual marginal adjustments in the last 10 years following which the cattle population officially increased by 5 million head' (Aklilu 2002: 4).*

Despite the large national herd/flock, gross production of meat and milk per capita in Ethiopia is very low – less than 6 kg of meat and about 21 kg of milk per person per year for the nation as a whole (Table 1).

**Table 1: Ethiopia Livestock Production 2005**

Production	Metric tonnes	Kg/person/year
Meat liveweight (exclude pigs and poultry)	425,810	5.7
Milk	1,583,250	21.3
Wool	12,000	
Hides and skins	81,216	

Source: FAOSTATS

**Table 2: Ethiopia Number of Livestock 2005**

Livestock	Number
Sheep	17,000,000
Goats	9,626,000
Cattle	38,500,000
Horses	1,500,000
Camels	470,000
Asses	3,800,000

Source: FAOSTATS

Livestock and livestock products provide about 10% of Ethiopia's foreign exchange earnings, with hides and skins constituting about 90% of the total livestock contribution (Table 3). According to data provided by the US Embassy in Ethiopia:

*The leather industry is the second largest foreign exchange earner after coffee. In 1998, the sector exported \$41 million primarily to Europe, Asia and the Middle East. Hides and skins make up the majority of these exports, accounting for over 99% of leather exports (STAT-USA, no date).*

*In 2000, the Ethiopian Ministry of Agriculture estimated that the skin removal rate was 7% for cattle, 33% for sheep and 37% for goats. This translates into an output of 2.4 million cow hides, 8.3 million sheepskins and 7 million goatskins in 2000. On average, Ethiopia has the capacity to supply 16 to 18 million pieces of hides and skins to local tanneries (STAT-USA, no date).*

**Table 3: Share of livestock and livestock products in foreign exchange earnings**

	% contribution of animal and animal products to total export	% contribution of hides and skins to animal exports	% contribution of meat to animal exports	% contribution of live animals to animal exports
1995-6	12.38	96	4	0
1996-7	10.47	91	6	3
1997-8	9.36	90	8	3
1998-9	8.43	87	11	2
1999-00	8.43	86	10	4

Source: Aklilu 2002: 40.

In contrast to leather exports, live animal and meat exports are modest – averaging between about 5% to 14% of the total value of livestock product exports. Animal and meat exports also fluctuate widely from year to year (Table 4):

**Table4: Ethiopian live animal and meat exports 1993- 2004**

	Cattle – head live	Goats – head live	Sheep – head live	Beef and veal – metric tons	Goat meat – metric tons	Mutton and lamb – metric tons
1993	5,600	0	8,800	0	0	33
1994	2,250	5,293	17,975	15	69	124
1995	25	0	22,800	73	243	259
1996	0	0	4,000	73	243	259
1997	800	0	4,000	15	1,490	312
1998	3,650	55	20,000	47	2,302	155
1999	1,791	36	7,880	1	1,818	87
2000	326	160	29,970	0	1,149	13
2001	44	0	15,000	0	222	20
2002	651	0	855	8	879	184
2003	552	47	11,706	0	2,094	1,501
2004	33	120	53	177	2,094	8

Source FAOSTATS

Some of the fluctuations in trade recorded in Table 4 result from what Aklilu calls ‘inconsistent and at times self-defeating government policies over the past 30 years’ (Aklilu 2002: 41). The poor provision by government of veterinary services illustrates the problem. Disruption to Ethiopian exports can be caused by veterinary embargos imposed on livestock by importing countries, but the government has made little progress in addressing the problem:

*Ethiopia has never managed to create a DFZ [disease free zone for livestock quarantine prior to export]...It is also not clear if there are plans to create new DFZs. Existing quarantine centers are not properly equipped and some are inconveniently located...though there are plans to build four new holding grounds/quarantine stations. Stock routes and holding grounds destroyed during the war between Ethiopia and Somalia in the late 1970s have not been repaired since then (Aklilu 2002:8).*

The lack of investment in livestock production and trade does not reflect the substantial economic contribution of this sector to the national economy:

*Livestock contribute about 40% of agricultural GDP or more than 20% of the total GDP (or even more if other intermediate values of livestock are properly assessed)...A study undertaken by OAU-IBAR ... indicate that between 1993/4 and 1998/9 the Government of Ethiopia allocated only 5% of its recurrent expenditures on agriculture and less than 0.3% on livestock or 3% of the recurrent agricultural expenses (Aklilu 2002: 6).*

The official export figures in Table 4 also do not represent the full extent of Ethiopia’s involvement in international livestock trade, much of which is deemed by the authorities to be illegal. Based on interviews with Ethiopian government officials the BBC reported:

*Smuggling of live animals, hides and skins from Ethiopia into neighbouring countries is costing the country’s treasury an estimated \$100 million each year.’ (BBC 2001)*

The movement of livestock through illegal channels reflects the difficulties and cost of moving them legally:

*Superimposed structural constraints, particularly in Sudan and Ethiopia, are affecting the efficiency of the domestic livestock markets besides complicating the export procedures unnecessarily. The core of these problems is institutional ego and the drive to benefit institutionally (financially or otherwise) rather than collectively as a nation. The end results of such rivalries are duplication of efforts, lengthy bureaucracy, wastage of time and resources that lead to inefficiency in international markets.’ (Aklilu 2002: 11).*

*For exporters there is 'a wide variation in the amounts of service charges, fees and taxes incurred by livestock traders depending on the source of supplies. These variations emanate mainly from the different levels of service charges and fees applied by the various Regional States and also from a convenient misunderstanding of the Federal Acts to enrich the State's coffer.'* (Aklilu 2002: 46).

Similar problems undermine the accuracy of figures on domestic livestock trading by deflecting this trade out of official channels:

*It is difficult to find accurate data on the number of livestock slaughtered in Addis as available data suggest that only one-third to one-half of the cattle slaughtered at [the municipal abattoir]... are supplied through the terminal markets of Addis [which are also operated by the municipality]. Furthermore, according to some estimates an almost equal number of cattle are slaughtered outside of the designated abattoirs, which are not recorded....The number of sheep slaughtered in the abattoirs is almost negligible despite mutton being as equally, if not more, preferred as beef in Addis.'* (Aklilu 2002: 36).

As with the export trade, one of the reasons domestic traders avoid official channels is the extractive nature of government's involvement in trading:

*Based on a three year cattle price data (1998-2001) collected by the City Bureau of Agriculture, the proportion of transaction costs and service fees at the [municipal market in Addis] including broker fees is equivalent to an astounding 17% of the purchase price of a steer, 29% of a Bullock/oxen and 27% of a barren cow.'* (Aklilu 2002: 38).

Despite these difficulties, the marketing of livestock has become fundamental to pastoral welfare and pastoral production strategies. One report on Somali Region of Ethiopia states:

*Over the last three to four decades the Somali pastoralist society experienced a significant change in the economy. Basically, it was a change from a livestock subsistence society, which lived mainly on milk and meat as staple foods complemented occasionally with a little gain, to a livestock export oriented market economy developing comparatively sophisticated trade links, where the marketing of livestock allowed both cash earnings and – through bartering – the inflow of food- and non-food consumer goods from far away (UNDP 1998).*

For north-western Ethiopia's Somali Region, the main port for livestock exports is Berbera in Somaliland. The commodities traded through that port reflect the importance of the livestock trade for household food supplies. When trade was interrupted in 1998, local food prices inflated rapidly and shops closed.

*The three principal imports at Berbera port [are] sugar (1997: 39.2% of total import volume) rice (27.2%) and wheat flour (10.9%). Other major imports include building materials, oil, car spare parts, cigarettes, soap, clothes, pasta and dates. On the Ethiopian side of the border the favoured barter commodities are generally sugar, rice, pasta, dates, textiles, shoes and ...electronics (UNDP 1998).*

Increasing dependence on markets for essential food supplies has also been recorded among Borana pastoralists in southern Ethiopia:

*As human populations grow in rangeland areas...pastoralists like the Boran will be forced to engage in more commercial livestock activity simply to increase human carrying capacity – exchanging animals for more calories as grain could be one means to this end.'* (Desta and Coppock 2005: 1; for a more general discussion of the issue of pastoral diversification through commercial involvement see Little et al. 2000).

## **Botswana: livestock as a route out of poverty**

99% of Botswana's agricultural land is rangeland, in which live about 600,000 people or 47% of Botswana's population (FAOSTATS and ILRI 2002). 80% of the country is covered by the Kalahari Desert; rainfall varies from an average maximum of about 650 mm in the northeast to an average annual minimum of 250 mm in the southwest. 71% of agricultural land is under communal or tribal tenure, 23% is state owned, and 6% is freehold lease for large-scale commercial ranching (Darkoh 1989).

Cattle were the traditional mainstay of the rural economy and were Botswana's leading export before independence in 1966 (Hubbard 1986). By the mid-1990s livestock accounted for 3%

of GDP and about 28% of the total agricultural gross product (Panin 2000 quoting CSO 1995). In the 1990s the contribution of cattle to the average annual rural household income was estimated at 33% and the contribution of small ruminants at 15% (Panin and Mahabile 1997). The ownership of goats is less skewed than cattle ownership. In one study area 85% of the households reared goats while only 40% kept cattle (Panin 2000).

**Table 5: Botswana Livestock Production 2005**

Livestock	Number
Sheep	400,000
Goats	2,250,000
Cattle	1,700,000
Horses	33,000
Camels	0
Asses	330,000

Source: FAOSTATS

**Table 6: Botswana Livestock Populations 2005**

Production	Metric tonnes	Kg/person/year
Meat liveweight (exclude pigs and poultry)	47,160	26.2
Milk	105,350	58.5
Wool	0	
Hides and skins	4840	

Source: FAOSTATS

## Beef exports

UK and European export markets for cattle and processed beef were developed before independence by the British Colonial Development Corporation which invested in the construction of a modern abattoir and in commercial ranches. The need to preserve access to international markets led to the construction by government of long fences ('veterinary fences') to separate quarantine zones to control Foot and Mouth Disease (FMD) (Cullis and Watson 2004). After independence, the Botswana Meat Commission, a parastatal, was given monopoly responsibility for meat exports.

Following the discovery of diamonds in the early 1970s, the importance of beef to national export earnings has been gradually replaced by minerals, but cattle have remained important for the rural economy. There is no doubt that cattle owners, especially large herd operators who can take advantage of export markets, have received generous government support:

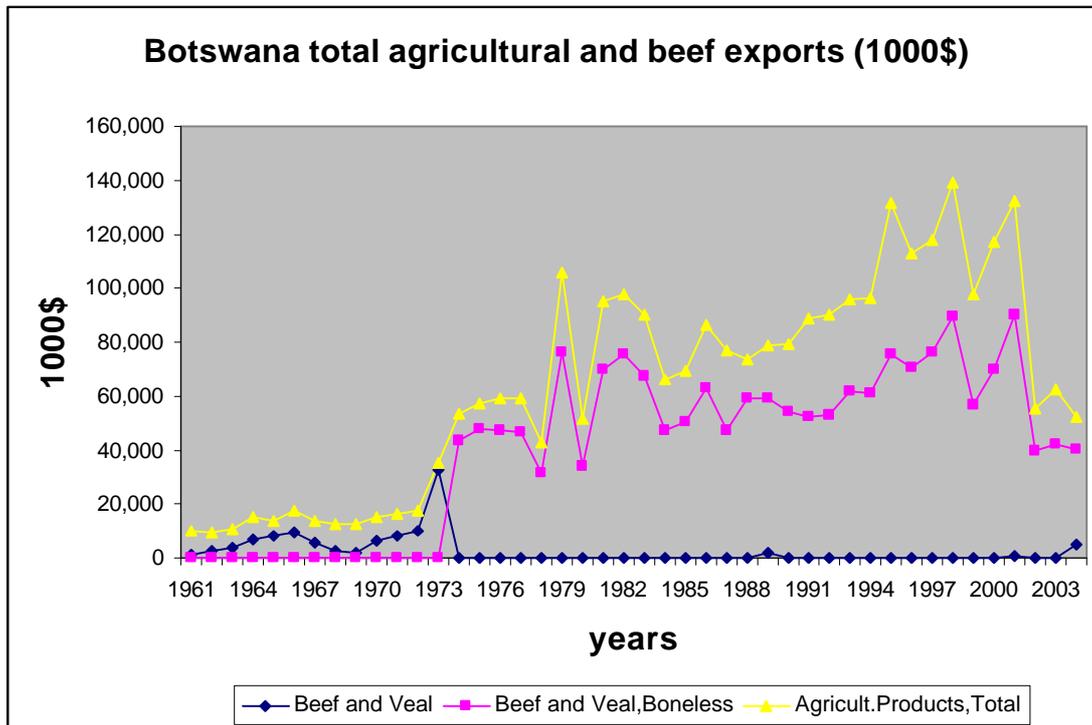
*There is considerable debate about the level of subsidies to the livestock sector in Botswana. While the reputed figure of 50% of production costs is disputed by some, it is generally agreed that 'government policies have made the livestock sector artificially attractive'. The emphasis on the livestock sector in government policies may be the result of 'the dominance of the livestock-owning elite in government and the administration' and 'there is no doubt that some of the highly placed members of the government and party who promote the policy benefit directly as wealthy cattle and borehole owners'. It takes several forms:*

- Veterinary services: veterinary drugs and vaccinations are largely free, and paid out of general tax revenue
- Subsidies: bull subsidies, artificial insemination subsidies and borehole-drilling subsidies

- Indirect subsidies: interest subsidised loans from the National Development Bank; tax advantages for livestock owners (losses may be written off against profits elsewhere)
- Land rents; 'artificially low' ... ranch rents [paid to the state by ranch lessees]
- Dual grazing: the continuation of dual grazing rights allowing ranchers to move their livestock onto communal lands
- Pricing policy: beef producer prices have been artificially high as the Botswana Meat Commission's slaughter policy is geared to meeting the high-priced beef exports quota market such as the EU, and avoiding open but low priced markets (Cullis and Watson 14, 15).

As a result of the government's supportive policies and the country's harsh climate, beef is essentially Botswana's only agricultural export (Figure 3).

**Figure 3**



The position of Botswana's livestock keepers is, therefore, substantially different from that of pastoralists in Ethiopia or Somalia, where governments (when they exist) extract more in fees and taxes than they return to the livestock sector in services. Also, whereas the bulk of the livestock traded in the Horn of Africa are exported unofficially or 'smuggled,' Botswana's beef trade is sanctioned by international treaties (initially the Lome Convention and currently the Cotonou Beef Protocol with the EU) and subject to intense official regulation to guarantee sanitary and health standards. Finally, whereas the Horn of Africa exports high volumes of low-priced live animals to regional markets, Botswana specializes in the export of chilled beef at premium prices to Europe.

For many decades in the twentieth century it appeared that Botswana's capital-intensive and technologically sophisticated approach to livestock exports was more profitable than that of the Horn. This difference is no longer so clear cut. In 1998/9 the Botswana Meat Commission posted its worst year since its formation in 1966 and only its fourth ever loss. Subsequently it has run a financial loss in every year since then except 2001. In 2003 it posted its poorest trading results since its inception (Stevens and Kennan 2005: 12). According to the analysis by Stevens and Kennan, the problem is caused by a combination of escalating export costs, flat prices, and competition for beef supplies from Botswana's increasingly prosperous domestic consumers.

The real, inflation-adjusted price for beef has remained stable in Botswana's European markets for three or four decades; at the same time Europe has demanded increasingly expensive sanitary and phytosanitary standard (SPS) requirements to meet the escalating health concerns of safety obsessed European consumers (Stevens and Kennan 2005; Perry et al. 2005). As a consequence of this cost-price squeeze, the BMC has been for decades paying beef producers the same real prices (denominated in international currencies). During this time, the real price that Botswana consumers pay butchers for better cuts of beef has gradually increased with the growing domestic prosperity generated by diamond exports. As local consumers and their purchasing power have bid cattle away from export channels, the BMC has not been able to buy enough cattle to operate its abattoirs at full capacity. The commission operates two abattoirs and throughput is currently sufficient to keep only one fully working. Idle plant is expensive to maintain and, as a consequence, the BMC has lost money.

The problems of Botswana's meat export industry are an instance of the 'Dutch disease' or 'the tendency to reduce the competitiveness of all internationally traded sectors other than the one that is generating the high foreign exchange inflows (Stevens and Kennan 2005: v). In an attempt to retain a broad-based export economy, the Government has been forced to subsidise cattle exports, ultimately to little effect:

*Government spends heavily on agriculture; its expenditure has been estimated as equivalent to over half of agricultural GDP. It does not provide figures for expenditure on the beef sector alone, but between 1994/5 and 2003/4 the budget of the Ministry of Agriculture rose in current terms by 241 percent. The expenditure estimate of the Department of Animal Health as a whole rose over the same period by 220 percent, accounting for 47 percent of the Ministerial total by the end of the period, whilst that for FMD control shot up by 271 percent. Another 'cost' is the transactions costs incurred by farmers. It is argued that the hassle of selling to BMC is rising, not least as a result of EU requirements. As a result of a November 2004 inspection by EU vets, for example, it is now necessary for all cattle to be transported to BMC in sealed trucks once a livestock movement permit has been issued....Taken together with the risk of an animal being condemned at the abattoir, all of this has reduced the incentive to sell to BMC to below the price premium offered over sales to local butchers or for informal slaughter (Stevens and Kennan 2005: 9).*

Table 7 shows that Botswana is not alone in its inability to fill its export quotas to the EC; the same holds true for the other Cotonou beneficiaries in southern Africa – Namibia, Swaziland and Zimbabwe:

**Table 7: EU imports from southern Africa 1995-2000 in metric tonnes per year**

Supplier	Quota	1995	1996	1997	1998	1999	2000
Botswana	<b>18,916</b>	11,966	10,373	11,851	13,012	11,518	11,140
Namibia	<b>13,000</b>	10,177	8,546	7,124	8,898	10,365	8,641
Swaziland	<b>3,363</b>	379	520	326	303	417	728
Zimbabwe	<b>9,100</b>	10,766	6,266	7,120	6,797	6,762	7,047

Source: Perry et al. quoting Eurostat 1998-2001.

Stevens and Kennan conclude that the only long term way to preserve Botswana's export beef sector is to increase the supply of marketed beef, to meet demand in both domestic and international markets. On the face of it, supply increases look possible. Botswana's cattle off-take rates (at 13%) and average carcass weight (at 175 kg) are lower than in neighbouring South Africa (off-take 17% and carcass weight 220 kilos) and in Namibia (off-take 14% and carcass weight 180 kg).

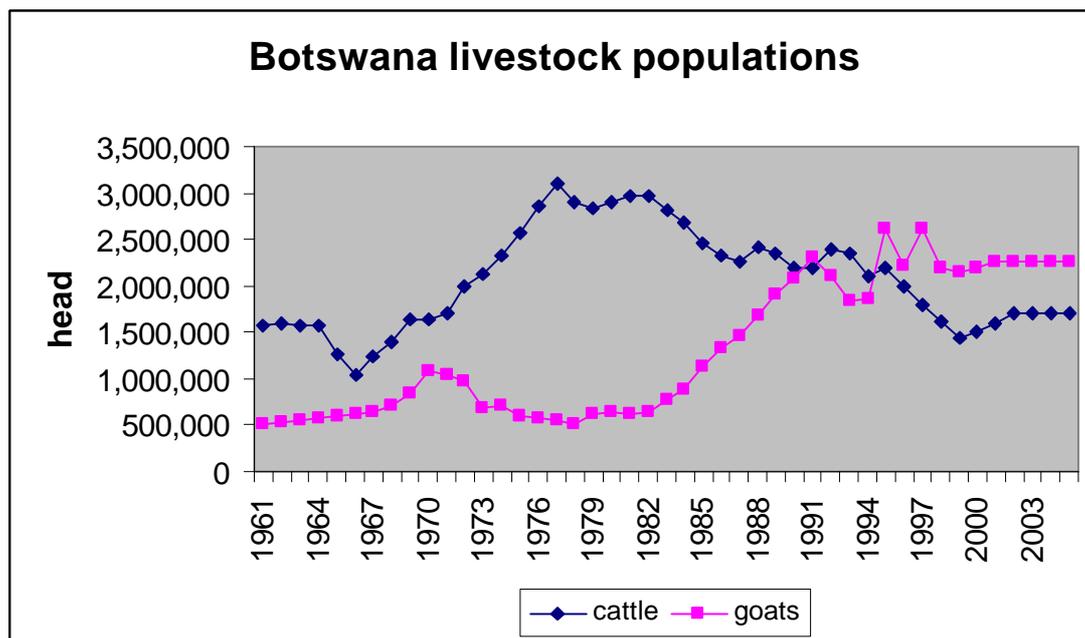
### **The role of livestock in rural livelihoods**

One solution to the export dilemma could be to increase the commercial efficiency of Botswana's 'traditional' livestock sector, which owns most of the nation's cattle and is the ultimate source of the bulk of all exported beef. Existing evidence suggests, however, that increasing commercial offtake may not be feasible because the costs of such an increase to other forms of livestock production may be unacceptably high for many livestock owners.

Part of the support for this conclusion comes from comparative studies of the economics of goat and cattle production in Botswana. These studies showed that the major component of the total gross revenue for both cattle- and goat-rearing enterprises was milk, a commodity that was predominantly consumed by livestock owning households rather than commercially traded. Milk output accounted for 70% and 67% respectively of the value of total cattle and goat output, while sales of animals accounted for 23% of the gross value of goat and cattle enterprises (Panin 195). If increased meat production for sale impinged upon milk production for immediate consumption (by deflecting milk from human to calf growth), then higher rates of animal offtake would probably be neither attractive nor economically prudent for some livestock owners, depending on the costs of replacing home produced milk with a purchased food alternative.

These studies also explain in part why Botswana's goat population has grown while cattle numbers have fallen since the early 1980s (Figure 4).

**Figure 4**



Goats provide a return on capital investment that is roughly comparable to cattle (28% versus 30%) but at a fraction of the capital cost of investing in cattle keeping (Table 8) <sup>1</sup>.

*The estimated capital invested in cattle per average household was five times that for goats. This confirms the widely held view that cattle rearing is capital intensive, and may explain why considerable numbers of smallholder farmers do not own any cattle....Since capital is the limiting factor for production, it is reasonable to suggest that rearing small ruminants is more practical for many smallholder farmers in Botswana (Panin 195).*

<sup>1</sup> In another study in 1992, Panin and Mahabile found that small ruminants provided a return of 34% on capital invested in their rearing, contributing 15% of household income or more than double the contribution from crops.

**Table 8: Comparison of the economic returns from goat and cattle-rearing enterprises, 1995**

	Total value goat enterprise in Pula (P1.00 = US\$.36 1995 exchange rate)	Total value cattle enterprise in Pula (P1.00 = US\$.36 1995 exchange rate)
Total cost of enterprise	809	2812
Net profit per enterprise	445	2492
Profit per animal	22	156
Percentage return on capital	28	30

Source: Panin 2000.

The difficulties of increasing commercial cattle output are also evident if we examine the comparative performance of large and small cattle herds in communal areas. Summarizing a wide range of studies available in the mid-1980s Behnke (1987) concluded that large cattle herds were operated on a commercial basis and small herds were managed in order to meet family subsistence needs:

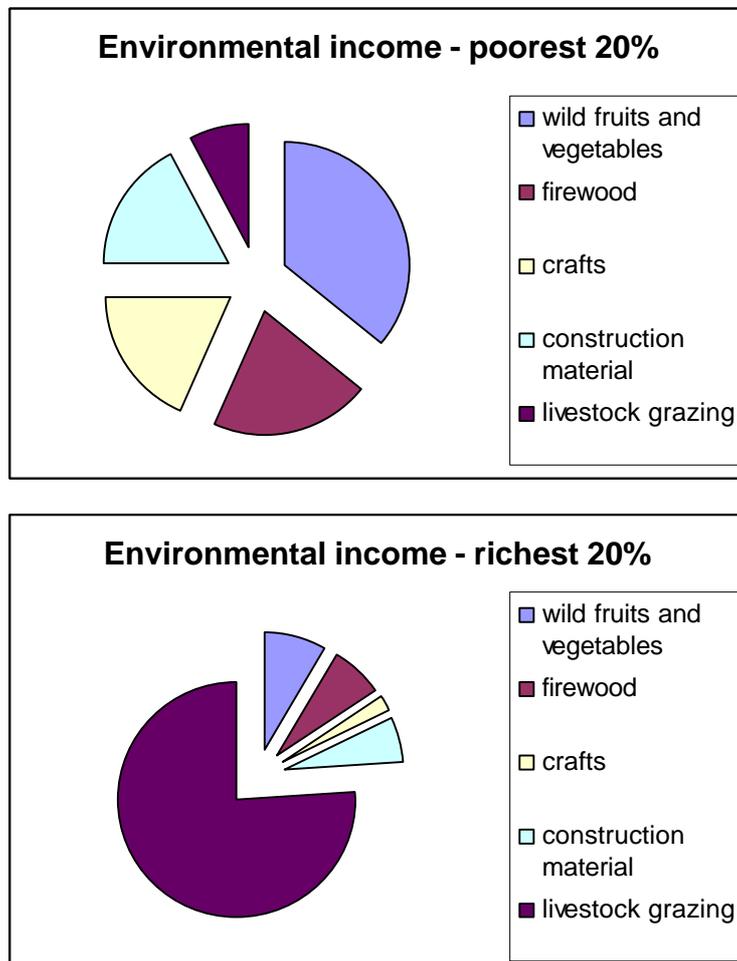
- Large and small herds produced different kinds of products. In addition to producing animals for sale, small herds produced a diverse array of goods which had a use value in the domestic setting but had either low or unrealizable cash value. Large herds specialized in the production of a single, valuable commodity: live animals suitable for slaughter.
- Large and small herding operations relied on different amounts and sources of labour. The mixed system of market and subsistence production characteristic of smaller herds was labour-intensive and gave low returns per unit of labour invested in the herding operation. For small herders the principal 'input' in the herding operation was domestic labour. The family sustained the herd and the herd sustained the family. Large herd operators, on the other hand, realized economies of scale with respect to the employment of labour, and followed less labour-intensive management practices.
- Large and small herds demanded different levels of cash expenditure. With less cash on hand, small herd owners adopted few of the recommended modern practices which required them to spend money. Large herd owners, on the other hand, were in a position to spend money in order to make money.
- Because of the intensive way they were used, small herds maintained rough productive parity with large herds on a per animal basis. They did this despite major disadvantages of small scale, poverty and restricted access to critical landed resources.
- Because of their poverty, small subsistence-oriented producers actually sold under duress a greater percentage of their herd than did large commercial operators.

In Botswana increasing commercial involvement did not mean that herds could be managed more profitably per head or even that animals could be sold at a higher rate. It simply meant that purchased inputs displaced domestic labour in the production process, and that specialized single-commodity production replaced the production of a diverse array of goods for home consumption. Subsistence production was advantageous to small herd owners because in-kind animal produce consisted largely of replenishable products. By concentrating on live-animal produce, small herd operators hoped to both maintain a reliable income and maximize long-term herd growth. Only by achieving herd growth was it economic for them to commercialize their operations.

Increased commercial production from communal rangelands therefore requires an increase in the average size of cattle herds. This growth could be achieved either through expansion of the national cattle population or by a concentration of cattle wealth among fewer owners. The national cattle herd has, in fact, contracted in the past quarter century (Figure 4), but there is evidence of increasingly uneven distribution of cattle ownership. It seems unlikely, however, that changes in ownership patterns will occur rapidly enough to produce the required increase in Botswana's commercial beef offtake.

Figure 5 contrasts the different strategies of environmental exploitation employed by the richest and poorest residents of one communal area in Botswana (Kerapeletswe and Lovett 2001: Table 1, page 7). Grazing is the least important source of income for the poorest and the most important source of environmental income for the richest.

**Figure 5: Environmental incomes from one communal area in Botswana**



(Source: Kerapeletswe and Lovett 2001)

We are now in a position to identify a final benefit derived by rural Tswana from livestock – they provide a route out of poverty, in several stages. The poorest of the rural poor have no livestock and depend for support largely on gathering wild produce and on public and private transfers of cash. The rich have significant livestock wealth which provides direct benefits and the means to engage in arable production (Kerapeletswe and Lovett 2001). Because they require little start-up capital, goats help poorer households begin the process of stock accumulation (Panin 2000). As small livestock owners shift to cattle, the process of accumulation can be maintained by the labour-intensive extraction of live-animal products from small cattle herds, followed by regular commercial sales when herds have grown sufficiently to sustain offtake (Behnke 1987).

### **Zimbabwe: livestock as agricultural inputs**

84% of Zimbabwe's agricultural land is pastures (FAOSTATS); more than 6% of the population of Zimbabwe live in areas suitable for rangeland-based production systems based only on livestock (ILRI 2002). More broadly, in the mid-1990s 70% of Zimbabwe's human population lived in communal or smallholder farming areas receiving less than 650 mm of average annual rainfall (Francis et al. 1999). More than 85% of these communal area farmers used animal draft power for tillage and transport. Oxen provided more than 75% of this power, though cows and donkeys were becoming more important (Francis et al. 1999).

**Table 9: Livestock populations in Zimbabwe, 2005**

Livestock	Number
Sheep	610,000
Goats	2,970,000
Cattle	5,400,000
Horses	28,000
Camels	0
Asses	112,000

Source: FAOSTATS

**Table 10: Livestock Production in Zimbabwe, 2005**

Production	Metric tonnes	Kg/person/year
Meat liveweight (exclude pigs and poultry)	110,206	8.5
Milk	248,000	19
Wool	18	
Hides and skins	10,828	

Source: FAOSTATS

Animal draft power is the key to understanding the economic importance of livestock to communal area residents. Table 11 estimates the relative economic importance of livestock to communal farmers in one semi-arid region. According to this recent study, nearly a quarter of cash and in kind income is attributable to livestock.

**Table 11: Household income by source: Masvingo Province, Zimbabwe**

Income source	% contribution to average household income in cash and kind – total 100%
Wages and home industries	12
Remittances	21
Gardens	8
Woodlands	15
Dryland crops	21
Livestock	23

Source: Campbell et al. 2002

Table 12 from the same study breaks total livestock output into its cash and subsistence components. According to this table, 66% of total livestock output is provided by transport and draft power services, only a small fraction of which is monetarized. If we add the value of manure on to this figure, nearly three-quarters of the output of communal area cattle is in the form of inputs into arable agriculture. Cash income from meat and animal sales constitute only 4% of the total income from livestock.

**Table 12: Average cash and subsistence gross income from livestock per household per year (\$Z)**

	Subsistence income	Cash income	Total income	% contribution to total livestock income
Manure	382	0	382	7
Milk	810	48	858	15
Meat	457	14	471	8
Transport	1062	36	1098	19
Draft	2588	86	2674	47
Hides	16	0	16	0
Animal sales	0	228	228	4
Overall	5318	412	5727	100

Source: Campbell et al. 2002

Livestock in the communal sector, and cattle in particular, do not primarily provide goods for immediate consumption or sale; they instead support arable production which is (if we combine the income from gardens with dryland cropping) the single most important source of household income (Campbell et al. 2002).

These conclusions are supported by Barrett (1992), who reviewed the literature on communal livestock production up to the early 1990s (Table 13). Barrett's estimates of the relative importance of different kinds of livestock outputs are remarkably similar to those of Campbell et al. (2002), despite the two decades that separate the studies. According to Barrett about 64% of cattle output is in the form of draught power; Campbell et al. give the comparable figure of 66%. Barrett found that milk constituted 14% of output by value, whereas Campbell et al. estimate 15%.

**Table 13: Estimate of the total annual economic output from a herd of 100 communal cattle**

Draught	Number of animals	Unit of output	Annual output 1991Z\$	Total value	% of total value
Draught	40	Days work	1,200	13,404	63.6
Milk	30	Litres	3,375	2,869	13.6
Manure	100	Cartload	1.5	1,800	8.5
Local offtake	3	Kg meat	480	1,200	5.7
Commercial sales	2	Head	2.5	1,000	4.7
Herd growth	2	Head	2	800	3.8
Total				Z\$ 21,073	100

Source: Barrett 1992

Based on these estimates, Barrett calculated that the total annual gross value of output per animal was Z\$ 210. In the aggregate Barrett calculated that the Zimbabwe communal herd contributed roughly Z\$800 million (or about US\$250 million) to the national economy at 1991 prices.

A similar attempt to calculate the average value of cattle output was undertaken by Scoones (1989) based on prices in the late 1980s (Table 14):

**Table 14: The economics of livestock production in the communal areas**

Activity	Z\$ per working beast per annum
Ploughing	112
Manure	10
Milk	290 per cow
Calf production	105 per cow
Work	68
Sale for beef	350 (at age 8 years)

Source: Scoones 1989

Based on the estimates in Table 14, Scoones calculated that the average per annum output of a beast over a lifetime of eight years was Z\$353 for a female and Z\$140 for a male, i.e., values that bracket Barrett's estimate of Z\$210 for a beast of unspecified sex.

These calculations are important for understanding the relatively insignificant role of cattle sales and slaughter in communal area production systems. According to Barrett quoting official statistics from the 1960s and 1970s, the combined sales and slaughter offtake rate from communal herds was only 6%, a figure broadly in line with later estimates by other authorities (Mutiwanyka 1988). The contrast with the commercial ranching sector in Zimbabwe is clear:

*Annual slaughter offtake from the commercial herd has been in the range of 15 to 23 per cent, while from the communal herd it has been less than three per cent...In the decade since independence the commercial cattle herd has contracted significantly while the communal herd has increased...This has caused a significant reduction in the supply of slaughter stock to the meat industry, leading to regular meat rationing on the domestic market and public pressure to reduce exports (Barrett 1992).*

In light of the preceding discussion, low offtake rates do not necessarily indicate that communal area livestock producers are economically irrational, conservative or inefficient. They simply produce a broad range of goods and services from their herds, but especially traction and transport inputs that are essential for their primary economic activity – arable agriculture. In this agro-pastoral production system, high rates of offtake would be a dysfunctional dissipation of capital and of arable productive capacity; instead, if a household can afford it, they hold on to cattle as long as a beast remains reproductive or capable of ploughing:

*About 30-45% of communal area farmers have four or more oxen, which they consider as adequate animal draft power .... Thus, the majority of farmers do not have adequate animal draft power. For example, Francis ... found that only 5-8% of the farmers in Chinamhora communal area had sufficient draft animals. Farmers who do not own their own draft animals hire them from farmers who do, but their access to draft power is always untimely and associated with poor crop yields (Francis et al. 1999).*

Communal livestock management practices that emphasize in-kind live-animal outputs at the expense of terminal outputs (such as sales and slaughter) would appear to do a reasonable job of maximizing agricultural incomes despite the overcrowding and poverty that prevail in the communal areas. In the same district where communal cattle owners were realizing an average annual gross return per beast of Z\$140-350, Scoones estimates that commercial beef cattle producers reaped about Z\$ 10/beast/year (Scoones 1989: 7). Barrett concluded that communal area livestock husbandry generated on the order of Z\$30 per hectare, as compared to Z\$20 per hectare for commercial ranches.

In sum, the 'communal' or 'traditional' livestock production systems of Botswana and Zimbabwe can be characterized as poor, intensive, and (especially in Zimbabwe) market averse. Total output per beast is high, but only because herds are small, their owners have few alternative employment opportunities, and they can therefore devote relatively lavish amounts of labour to extracting a wide range of products and services from their animals.

Herd owners also tend to concentrate on in-kind production of goods for home consumption rather than commodities for sale, and they do this for sound economic reasons. Home produced products that are consumed directly have a value comparable to their retail price, which is what it would cost householders/herd owners to purchase replacement or substitute goods. Production of commodities for sale, on the other hand, is discouraged because these goods generally fetch a much lower farm gate price. As long as households have non-agricultural sources of cash income (typically through remittances, employment, the informal economy or state social security), it pays them to use their agricultural output to conserve scarce cash resources rather than earn money through sales.

These production systems employ generous amounts of labour but few purchased inputs, produce a broad spectrum of live-animal products, and are oriented to satisfying household consumption needs. They appear superficially to be archaic survivals of traditional subsistence pastoralism, and are often mistakenly interpreted as such. In fact this assessment is accurate only to the extent that these production systems preserve indigenous techniques of animal management and exploitation. From an economic perspective, these are modern adaptations to a specific niche within industrializing economies: survival on the semi-arid margins of economies characterized by industrial food supplies and limited or low-wage employment opportunities for unskilled labour.

### South Africa: feeding and employing a labour reserve

84% of South Africa's agricultural land is pasture (FAOSTATS); over 6.3 million people or about 16% of South Africa's total population live in rangeland areas (ILRI 2002).

**Table 15: Livestock populations in South Africa, 2005**

Livestock	Number
Sheep	25,316,424
Goats	6,407,000
Cattle	13,764,000
Horses	270,000
Asses	150,000

Source: FAOSTATS

**Table 16: Livestock Production in South Africa, 2005**

Production	Metric tonnes	Kg/person/year
Meat liveweight (exclude pigs and poultry)	801,547	17.7
Milk	2,552,000	56.3
Wool	44,156	
Hides and skins	94,620	

Source: FAOSTATS

Perry et al. provide the following capsule summary of livestock import/export in South Africa:

*South Africa is a net importer of livestock products and also imports large numbers of live animals from Namibia: currently around 400,000 cattle, 200,000 goats and 900,000 sheep annually. However it also exports some livestock products, including beef, lamb, goat and pork, targeting high value niche markets. Although the commercial sector is probably close to maximum production, 40% of the national herd belongs to emergent black farmers. Increasing the productivity of and market access by this sector of the national herd is seen as essential to provide the volumes of meat needed by growing international, regional and domestic markets, and will also make a positive contribution to poverty alleviation in this previously disadvantaged sector of society....*

*The South African Meat Industry Company (SAMIC) established in 1997, is the national representative organisation of the South African red meat industry and serves as an umbrella organisation in order to promote the effectiveness and growth of the South African meat industry....One example of SAMIC's achievements was the successful application to the United States for tariff-free exports under the African Growth and Opportunities Act....SAMIC also played an active role in re-establishing the export of beef to Saudi Arabia after a ban was imposed in 2000 due to rumours of rinderpest in South Africa....SAMIC is also involved in the audit of premium quality brands of meat products. Branding as a marketing tool is becoming increasingly important in the South African meat industry and several suppliers have successfully developed niche markets for their branded products....Currently a range of brands are audited by SAMIC including Woolworth's 'Free Range' meats, Pick 'n Pay's 'Country Reared' beef and lamb and the Kalahari Kid Corporations 'Desert Lamb' (Perry et al. 2005: 24-25).*

From this description it is clear that South Africa possesses the most technically advanced and sophisticated marketing operation of any livestock exporting country covered in this survey. As Perry et al. note, 40% of the national herd may be held by emerging black farmers in a position to profit from selling their produce. But those who remain behind in the communal areas have little opportunity to profit from these sophisticated marketing arrangements. This conclusion is supported by a recent government survey of agricultural production that compared output in the former black homelands and the former white areas of the country (Table 17).

According to this survey conducted in 2000, there are an estimated 698,000 farming operations keeping livestock in South Africa, 84,000 in the former RSA and 614,000 in the former homelands. 88% of all farming operations that keep livestock are therefore in the former homelands, despite these farms producing only 18% of the nation's meat, 1% of its milk, and 14% of the hides and skins. Quite clearly, these are very small livestock operations and they produce primarily for home consumption, 96% of meat and 85% of milk being used in this way. Only animal fibres – wool and mohair – are predominately sold by communal farmers, who contribute a negligible amount of these commodities to national production (Table 17).

To find out more about how these small, communal area farmers operate we must turn from national surveys to research studies of specific areas and communities. C.M. and S.E. Shackleton have been involved in many of these studies and in methodological debates about the valuation of rural in-kind production systems in South Africa (Dove et al. 2005; Shackleton et al. 2002; Shackleton et al. 2001; Shackleton et al. 2000; Shackleton et al. 1999).

**Table17: The production and use of livestock products and maize meal in South Africa**

Products	Total production former homelands x 1000	Total production former RSA x 1000	% homeland production kept for home consumption	% homeland production in total national production
Maize meal kg	53965	233274	98	19
Meat kg	30691	139454	96	18
Milk litres	25665	2955134	85	1
Butter kg	107	101	100	51
Other dairy products kg	20	116	100	15
Wool kg	2645	57990	1	0
Mohair kg	53	16182	3	0
Hides and skins number	86	520	64	14
Other animal products	32	16	99	66

Source: Statistics South Africa 2002, calculated from Tables 8.3.2 and 8.3.3.

Note: 'Former RSA' refers to the whites-only area of the old apartheid state and therefore excludes black homelands.

Conclusions to emerge from these studies include:

- Communal area residents hold livestock for a variety of reasons including 'cash from sales, a form of employment, milk for home consumption, for funeral purposes, as a form of investment, inherited the livestock, slaughter for feasts/home consumption, for paying bride-wealth, for sale of hides and skins, have land suitable for cattle farming, to help other, for cow dung and for draught/transport purposes' (Andrew et al. 2003). The uses to which livestock are put shifts from locality to locality depending on circumstances and environmental conditions.
- 'The contribution of livestock has been underestimated in economic and livelihood security terms for several reasons, including a focus on productivity, limited consideration of non-monetised products or services, and a neglect of small stock such as goats or poultry' (Shackleton et al. 2000: 2).
- 'A detailed study by Shackleton et al. ...in Bushbuckridge, South Africa, farmers obtained a net annual value for livestock goods and services of US\$ 765 per household for cattle owning households; US\$79 pr household for goat owning households; and US\$25 for non-owning households....The net return per hectare from this and other studies in communal areas are approximately US\$69 per year. By contrast standard valuations of communal livestock systems capture only one quarter of the direct use value, leading to the conclusion that they are unproductive and less efficient than commercial systems' Shackleton et al 2000: 2).
- Adams et al. (2000) estimated the annual contribution of livestock to communal areas at R1,200 per household with a total national value of this sector at R2.88 billion per year.

In sum, livestock held by communal area producers do make a significant contribution to the national economy, but they do not provide commodities for sale or export. The goods and services provided by communal area livestock are consumed at home or exchanged locally, for economic reasons identical to those given in the preceding analysis of subsistence-oriented livestock production in Zimbabwe. What the communal areas do contribute to South Africa's wider national economy is people. The homelands were the labour reserves of colonial South Africa, designed to provide holding grounds for a supply of labour for other sectors of the economy. Working age communal area residents still spend much of their time

employed and living away from home, while their families live cheaply in the rural areas. When they are too old to hold down formal jobs, many of these workers also retire to the rural areas to care for grandchildren and engage in agricultural production to supplement their pensions. From the perspective of the national economy, the communal areas are a source not of commodities but of affordable labour. It is difficult to imagine how the situation could be otherwise given the overcrowding and small land areas available to communal area farmers and herders.

## Namibia: a research deficit

98% of Namibia agricultural land is pastures (FAOSTAT), and 54% of the national population resides in semi-arid rangeland areas (ILRI 2002). Ruminant meat production per capita is the highest of any African country covered in this survey (Table 19).

**Table 18: Livestock populations in Namibia, 2005**

Livestock	Number
Sheep	2,900,000
Goats	2,100,000
Cattle	2,500,000
Horses	48,000
Asses	120,000

Source: FAOSTATS

**Table 19: Livestock Production in Namibia, 2005**

Production	Metric tonnes	Kg/person/year
Meat liveweight (exclude pigs and poultry)	96,333	47.4
Milk	109,000	53.6
Wool	2,200	
Hides and skins	10,650	

Source: FAOSTATS

On the common southern African pattern, rural land in Namibia is held under three different kinds of title:

- freehold land occupied by fenced commercial ranches created for European settlers,
- unfenced communal land initially designated for various African ethnic groups,
- state land which is usually desert unsuitable for agriculture and leased to mining concessions.

At independence in 1990 the distribution of land was heavily skewed, with more than half of the agriculturally usable land occupied by about 4,200 mainly white commercial farmers, and the rest occupied by 120,000 black rural households (Adams and Devitt 1992: 1). Government land redistribution programmes have subsequently somewhat altered this pattern (Werner 2003).

The bulk of African-occupied communal land lies north of a veterinary quarantine cordon fence commonly known as the 'red line', which runs continuously from east to west and cuts off the northern quarter of the country. South of the line, livestock are certified as disease free and conform to sanitary standards that meet EU and South African import requirements. Namibia's northern border with Angola is open and livestock north of the quarantine fence are not certified disease free and cannot be legally exported or moved to southern Namibia without undergoing quarantine.

The balance of livestock numbers held on commercial ranches and in the communal areas has shifted since independence:

*The latest National Livestock Census shows that the number of cattle in the communal areas continues to increase, whereas in the commercial areas numbers continue to fall. The number of cattle in communal areas has climbed steadily to reach an estimated 1,659,292 in 2000 compared to the post-1990 low of 943,735 in 1993. In the commercial sector the highest number of cattle was reported in 1992 (1,178,875) while the lowest estimate was in 1996 (743,057). The situation whereby the number of cattle in commercial areas exceeded the number of cattle on communal land has changed dramatically. Communal cattle now outnumber commercial cattle by almost two-to-one (Institute for Public Policy Research 2002: 4).*

There are significant impediments to marketing northern livestock for export purposes:

*Because of the red line, animals in the northern communal areas go through cumbersome processes before they can be auctioned. The livestock are quarantined for 21 days, during which farmers have to pay for their fodder, while after slaughter, the frozen meat is quarantined for a further 21 days. Farmers say not only do their animals lose body mass, but they also pay lots of money to transport their livestock to the quarantine facilities....[Commercial] off take from these areas is less than three percent compared to an off take of 25 percent south of the fence (Tjaronda 2006).*

The Namibian economy is diversified and depends upon a mixture of agriculture, mining, fishing and tourism. While the economic contribution of the livestock industry to this mix is modest but significant, its contribution to employment is much larger:

*Depending on rainfall, between 30% and 80% of the market demand for cereals has to be imported. The country is thus far from self-sufficient in food production. However, the value of agricultural exports – beef accounted for more than 70% of agricultural exports since 1990 – has exceeded the costs of importing basic food stuffs several times over since Independence....The contribution of the agricultural sector to GDP is modest and has not exceeded 10% since Independence. However, the economic impact of the sector is much larger than these figures suggest due to forward and backward linkages with the wider economy. In order to capture these linkages a multiplier of 1,8 is generally accepted. This means that the sector has contributed up to 18% to the GDP since 1990. Approximately 70% of the Namibian population depends on the agricultural sector in one way or another (Werner 2003: 6).*

By almost any standard – per capita ruminant meat production, the extent of rangelands, the growth of communal livestock holdings, contribution to GDP or employment – Namibia's developing pastoral sector is important and should constitute an important case study for this review. Unfortunately, the availability of data does not reflect the importance of Namibia's communal livestock sector.

Prior to Independence in 1990, warfare and insecurity discouraged research in northern Namibia's communal areas. Since 1990 there has been excellent work on the performance of the country's commercial ranching sector (for which there is good longitudinal data), but – as best we can determine – no comparable work on indigenous African production systems (Lange 1997). New work on livestock in the communal areas has instead focused on environmental impact assessment and on debates about the natural resource management capabilities of rural communities (see especially journal articles by David Ward and reports published by the Directorate of Environmental Affairs). Perhaps understandably, commercial assessments of particular livestock-based industries are also biased towards the commercial ranch sector which has traditionally supplied these industries (Directorate of International Trade 2001).

In short, questions about the economic performance of communal area agricultural systems seem to have been genuinely under-researched in Namibia. Bollig (2006: 44-46, 205-207) provides a brief but excellent account of livestock marketing among the Himba of north-western Namibia. The picture that emerges is of a pastoral people dependent (like the Somali) upon trade for grain supplies and eagerly seeking marketing opportunities. Bollig's focus, however, is on the contribution of marketing to Himba welfare, rather than the contribution of Himba livestock to the general welfare. By way of contrast, a short report by

NOLIDEP-KFSR/E summarizes the literature up to 1997 on the contribution of livestock to the livelihoods of people in the Okavango Region. Okavango receives more rainfall than Kaokoland where the Himba live, and Okavango residents pursue very diversified household provisioning strategies which include fishing, hunting, gathering, remittances, informal and formal employment and both arable agriculture and livestock keeping. Livestock sales rates are low, as they would be in comparable economies in the former homelands of South Africa. Commercial sales may be more important for large herd owners, on the Botswana pattern, but data on this point is insufficient.

If a more exhaustive search reveals no new sources of information, the economics of livestock production in Namibia's northern communal areas is disproportionately under-researched compared to the other African regions reviewed here.

## Malawi: animal poor and not pastoral

42% of Malawi's agricultural land is pasture, but less than 2% of the population lives in rangeland areas suitable to livestock-only agricultural production (FAOSTAT and ILRI 2002). Per capita meat and milk production is the lowest of any African country in this survey. Consumption is also low: 2.5 kg of beef, 0.7 of mutton and 76 kg of milk per capita (IDRC n.d.). Goats are the most numerous ruminant and average flock size is 8 head kept by farmers who own on average less than 1 to 1.5 ha of land (Chikagwa-Malunga and Banda 2006); net livestock income accounts nationally for only 1.8% of all income for poor rural households and 1% for non-poor households (PMS 2000). Ruminants in Malawi are kept on small farms. This is not a pastoral country and should be dropped from this review.

**Table 20: Livestock populations in Malawi, 2005**

Livestock	Number
Sheep	115,000
Goats	1,900,000
Cattle	750,000
Horses	45
Asses	2,200

Source: FAOSTATS

**Table 21: Livestock Production in Malawi, 2005**

Production	Metric tonnes	Kg/person/year
Meat liveweight (exclude pigs and poultry)	23,004	1.8
Milk	35,000	2.8
Wool	0	
Hides and skins	2,777	

Source: FAOSTATS

## Zambia: extending the frontier of commercial farming

85% of Zambia's agricultural land is pasture (FAOSTATS), and 14% of the national population lives in semi-arid rangeland areas suitable only for livestock production (ILRI 2002). Per capita annual milk and ruminant meat production is low, as is annual per capital consumption estimated at 12 kg for milk and for meat between 11 kg (Hicks 1995, citing figures for 1993) to 2.5 kg (Sinyangwe and Clinch 2000), the latter figure being half the average level of African consumption. Since 1964 Zambia has been a net importer of milk and meat (Hicks 1995).

**Table 22: Livestock populations in Zambia, 2005**

Livestock	Number
Sheep	150,000
Goats	1,270,000
Cattle	2,600,000
Horses	0
Asses	1,800

Source: FAOSTATS

**Table 23: Livestock Production in Zambia, 2005**

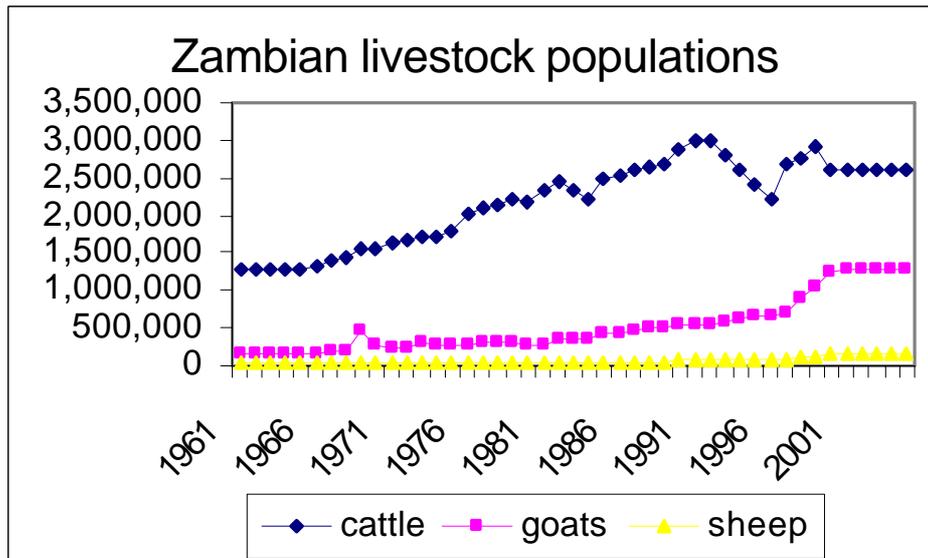
Production	Metric tonnes	Kg/person/year
Meat liveweight (exclude pigs and poultry)	46,074	4.17
Milk	64,200	5.8
Wool	0	
Hides and skins	6316	

Source: FAOSTATS

In terms of livestock ownership, the country is roughly divided between mostly southern areas occupied by ethnic groups (Tonga, Lozi, Ngoni and Mambwe) with a tradition of livestock management, and predominantly northern areas without a livestock background because a history of tsetse fly infestation. About 89% of the national cattle herd is held in Southern, Eastern, Western and Central Provinces; the remaining 11% is found in Northern, North-western, Lusaka and Luapula Provinces (Sinyangwe and Clinch 2000; see also the provincial break down of cattle populations in Mwenya et al. 1994: 470).

Cattle in Zambia are subject to an impressive array of diseases: Contagious bovin pleuropneumonia (reintroduced in 1997 Mangani n.d.), trypanosomiasis (Lubinga et al. 1997), brucellosis (Sovjak and Matejickova 2002), bovine herpesvirus-1 (Mweene et al. 2003), Rift Valley fever (Samui et al. 1997), fasciolosis (Phiri et al. 2005), and anthrax (Mwale 2000). When veterinary services broke down in the early 1990s following the withdrawal of government support, cattle numbers declined sharply due to disease outbreaks, especially in the southern provinces where animal densities were high (Figure 6):

Figure 6



Source: FAOSTATS

Agriculture contributes between 11% to 16% to total GDP in this mineral-based economy. 90% of domestic milk production for sale and 60% of marketed meat for sale comes from commercial farms situated primarily around cities and along the line of rail on about a quarter of the total available arable land. However, about 83% of Zambian cattle, 97% of the goats and 64% of sheep are held in the traditional sector (Sinyangwe and Clinch 2000). Agricultural officers and administrators have been complaining for at least half a century about low marketed offtake from traditional herds (Larson n.d., probably circa 1960):

*Productivity of cattle in the traditional sector is characterised by slow growth rates (5-8 years to reach market weight), high calf and adult mortality rates (20-30% and 9% respectively) and low reproductive performance....National herd growth rate is estimated at 3% with an average offtake of 8-9%. In comparison, production ratios for the commercial sector feature low calf mortality (1-2%), high reproductive rates (65-70%) and an offtake between 17-18% (Sinyangwe and Clinch 2000: 2)*

In a survey in 1995, over 200 smallholders gave the following reasons for livestock keeping (Table 24):

**Table 24: Reasons for livestock rearing, percent of respondents surveyed**

	Cattle	Goats
Cash income	30.5	37.5
Consumption	2.8	35.1
Draft power	33.3	0.2
Manure	5.5	8.5
Milk	12.9	2.0
Bride wealth payments	10.8	1.3
Social occasions	3.5	14.8
Social status	0.8	0.7

Source: Lungu n.d.: 138

Both goats and cattle are kept for cash; home consumption of goats is in the form of meat and from cattle in the form of draft power and milk. In light of the preceding southern Africa case studies in this review, Zambia appears to offer nothing novel on the topic of offtake rates versus household consumption and these issues are not further discussed. What is unique to

Zambia is a century-long but continuing process of the geographical expansion of animal draft power for small holder commercial agriculture.

### **Oxenization in northern Zambia**

At the beginning of the 20th century all traditional crop agriculture in Zambia was done by hand with a combination of axes, hoes and fire. Following the example of settler farmers and extension work by Christian missions, the adoption of ox ploughing was complete by the 1930s in some southern areas with a long tradition of cattle keeping. The subsequent spread of animal draft power was slowed by the depression, WW II, and a vogue for tractorization in the 1960s and 1970s after independence (Wood and Milimo 1994). The current phase of work on animal draft power began following the collapse of copper prices in the 1970s and the subsequent demise of government-subsidised tractor ploughing schemes, and involved the expansion of oxen ploughing into northern Zambia where previously cattle were uncommon.

This expansion was made possible by rural population growth and corresponding decreases in the length of the fallowing period which forced an increase in land use intensity in many localities (Loffler 1994). Northern Zambia was sitting on the cusp of a major agricultural transformation – from the hoe to the plough and from shifting cultivation to permanent fields (see Pingali et al. 1987 for a discussion of the evolutionary regularities in this process). The process of technical transformation has been retarded by several factors:

- The unavailability of cattle due to low rates of herd growth, massive losses due to disease following the withdrawal of government veterinary services (Kaoma-Sprenkels and Mwenda 2000), and (in a reversal of the usual official laments) the lure of quick profits at the local butchery (Lubumbe 1994).
- Low levels of animal management in communities that had no history of livestock ownership. Unpublished research by Behnke in the Chambeshi flood plain (Northern Province) in the late 1980s revealed high rates of stock mortality due to crocodile attacks, feral animals that were dangerous to milk and difficult to plough with, and low calving rates due to the total absence of bulls in some village herds, all the males having been castrated for ploughing by owners who assumed that someone else would leave a bull whole for breeding.
- Low farm gate prices for staple crops. Farmers in northern Zambia are adopting plough agriculture to produce surpluses for commercial sale, not primarily for home consumption. The inability of Zambian consumers to pay farmers attractive prices for their produce directly undermines incentives for farmers to expand the cultivated area: 'Increased use of animal traction will depend largely on the positive growth of the national economy, and especially on reductions in inflation and interest rates' (Mwenya 1994: 472).
- The unavailability of suitable equipment and blacksmithing in areas where mechanization is beginning to take off and demand for such services is low (Dibbits 1994).

There has nonetheless been considerable progress, including increases in farmer income (Kaoma-Sprenkels and Mwenda 2000: 88) and the doubling of cash crop areas under cultivation per farm (Loffler 1994: 358) following the adoption of oxen draught power. In a summary of the results of a national survey of animal traction, Dibbits (1994) reported that small and medium-scale farmers in Zambia prepared about 46% of their cultivated area by hand with hoes and 54% with oxen, with a small and unknown contribution from tractor ploughing. Between 1985 and 1990 the estimated number of trained oxen had grown by 48% to 266,000 head which ploughed a total area of 468,000 ha. For the preceding decade 1976-86, Wood and Milimo reported nearly a doubling in trained oxen numbers, from 90,000 to 179,000 (1994: 347).

Oxenization would therefore appear to have an immediate appeal to smaller farmers, to increase commercial crop production overall, and to provide the basis for a permanent transformation of the agricultural systems of the north of Zambia. Whether the animals that power these changes come from herds managed on a pastoral basis is an open question. Though most of the original breeding stock came from adjoining pastoral regions of Zambia, oxen distributed to isolated farms by donor-funded projects may be best described as farm animals. However, this is probably not an accurate description of how cattle are kept in communities where oxenization is occurring spontaneously without outside financial

assistance. In these villages animals may be held in collective village herds, individually kraaled only when they are being worked, fed on natural forage and standing crop residues, and moved seasonally short distances up and down-slope to avoid flooding and obtain fresh vegetation. These are 'range-based' husbandry systems that are situated in areas that can receive 1000mm of rain per year. Evaluation of the importance and organization of indigenous oxenization is, to the best of my knowledge, under-researched. Most published reports are on donor projects that are adept at self-promotion but may contribute less to long-term change than initiatives undertaken by the farmers themselves.

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