

# **Drought Losses, Pastoral Saving and Banking: a Review**

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## 1. INTRODUCTION

Pastoral communities in arid and semi-arid regions of Africa live with the expectation of drought and have developed coping mechanisms to mitigate its effects. They continue to suffer, and arguably increasingly suffer, catastrophic losses of livestock during drought, although the national statistics to quantify this are notoriously unreliable. The impact of drought is particularly acute for poorer members of communities with smaller livestock holdings and less developed social support networks. In many cases costly emergency responses are mounted to save human lives.

An earlier study (NRIL Project ZW0027) which investigated the impact of drought contingency planning and drought preparedness on pastoral communities established that there are several promising approaches. These include:

- Community based early warning systems
- Subsidising transport for rapid restocking to protect pastoralists' purchasing power at the onset of drought
- The provision of emergency feed and water (opening of protected areas etc.)

Little is known about the economics and sustainable financing of these elements of drought preparedness and there is a need for further research to establish the means of financing some of these interventions. For example, could finance be raised by the communities themselves to subsidise the transport of animals to market during drought? At the same time there is a dearth of information about the livestock losses suffered by households during drought, recovery periods and how this affects household marketing strategies over the drought/recovery cycle.

The purpose of this review is to examine the literature on drought losses and financial institutions that are available/accessible to pastoral communities. If pastoral communities are able to develop formal or informal savings and/or insurance it will enable them to have control over the types of interventions that are required during drought, reduce the need for central government and donors to intervene, encourage self-reliance and reduce dependence.

### 1.1 Background

Drought, whether meteorological, hydrological, agricultural or social<sup>1</sup> is Africa's principal type of natural disaster. The physical aspects of drought and its impact on affected households in sub-Saharan Africa are well documented along with household coping and survival strategies. A recent study has addressed the impact of drought on non-agricultural sectors and the wider economy (Benson and Clay 1998). This study

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<sup>1</sup> Meteorological Drought is a reduction in rainfall supply compared with a specified average condition over some specified time (Hulme, 1995)

Hydrological Drought is the impact of reduced rainfall on natural and artificial surface and sub-surface water storage systems

Agricultural Drought is a reduction in moisture availability below optimum level for crop (including natural grassland) production

concludes that there is considerable scope for the wider adoption of drought mitigation measures as well as the incorporation of the risk of drought into economic policies and planning. Drought mitigation needs to be part of government policy and planning but should not create unsustainable welfare mechanisms. Cash-for-work may be more appropriate than food-for-work as it stimulates the local economy.

The process of increasing integration of economies and liberalisation of food markets implies a shift of emphasis to market-based and cash-based targeted interventions that sustain livelihoods and away from supporting household food security with relief food. To date donors have shown little interest in supporting the development of drought mitigation policies and have concentrated efforts on the efficient delivery of famine relief. There is a need to reassess this strategy and to encourage governments to plan to mitigate the impact of drought and to encourage recovery of drought affected populations. These plans should be integrated into a nation's social and economic policy.

## **1.2 Pastoral production**

Many of the inhabitants of the arid and semi-arid rangelands of sub-Saharan Africa gain their livelihood from pastoral activities, using common property rangeland and water resources to raise their livestock. They live under highly variable climatic conditions, with their herds subject to large variations in feed and water availability. Managing these strong fluctuations in pastoral livelihoods is the main development challenge facing agencies seeking to support pastoral development.

Over the last decade, considerable progress has been made in predicting drought, in increasing the efficiency of drought emergency (food) aid and in restocking herds after the rains return. Knowledge on how to improve the resilience of pastoral communities to manage drought and reduce risk is still limited, but is crucial for the development of sustainable drought management systems.

## **2. THE MAIN FEATURES OF PASTORALISM**

African pastoral societies are characterised by a cultural and economic orientation towards livestock (cattle, sheep, goats and camels). Any surpluses generated by the pastoral system tend to be reinvested in livestock with a view to herd maximisation for cultural and economic reasons. Larger herds guarantee subsistence and income, confer status and may provide insurance against the impact of drought. Even educated members of pastoral ethnic groups, no longer dependent upon pastoral production for their livelihoods, tend often to continue to invest in livestock (sometimes as absentee owners). In good times there is a surplus of animals. The extent to which these are marketed depends on regional and inter-ethnic variation, interacting with the availability of and access to markets. There is a trend towards greater marketing of stock, but the historic involvement of pastoralists in livestock markets should not be overlooked (Kerven 1992).

A key feature of African pastoralism is mobility, with herds being able to move to distant grazing along traditional migration routes or in time of emergency to areas where grazing

or browse is available. As human populations increase and common property rangeland is taken by individuals (agriculture) and governments (national parks and game reserves) for other uses increasingly different pastoral ethnic groups find themselves competing for grazing resources. The inevitable result is conflict.

The marginal nature of pastoral environments (extreme variability and unreliability of rainfall, scarcity and seasonal variability of vegetation) and vulnerability to drought mean that mobility of people and livestock is essential. Herd growth is therefore opportunistic (tracking grazing availability) and livestock numbers increase during good years. Occasional crashes in the livestock population are inevitable in the face of drought and herd reconstitution post-drought can be a long, slow process depending upon the numbers of breeding stock which survive droughts. During drought pastoralists are particularly vulnerable to fluctuations in terms of trade between livestock and grain products as livestock prices plummet during drought and grain prices increase (Toulmin 1995).

A low human population density and the mobile nature of the population imply high costs for provision of services and infrastructure by government. The remote nature of pastoral areas also implies high marketing costs for livestock and livestock products and high prices for grain and consumer goods.

## **2.1 The economics of pastoralism**

Pastoralists keep animals for several reasons. They are a form of productive capital, they provide for subsistence (milk, meat and blood), provide transport (cattle, donkeys and camels) and serve as an important store of wealth and insurance. As a form of insurance they may be imperfect as they are subject to the impact of drought and disease. However, in the absence of alternatives, particularly financial markets and institutions, they are the only form of insurance available to many pastoral households.

In some cases capital/wealth is consumed directly (slaughter) but more often animals are sold to realise cash for grain purchases, and other necessities of life. The store of capital/wealth in animals is also reflected in social institutions such as marriage and inheritance. The largest transfer of livestock a male is likely to make in his lifetime is for bridewealth at marriage. Livestock are therefore a source of prestige and a means for partaking in complex networks of social obligations and reciprocity that mitigate risk (particularly for poorer households) (Hogg 1997).

The positive features of pastoralism include:

- Its flexibility and ability to adapt to changing climatic circumstances
- Self-sufficiency and independence (during times of adequate moisture)
- Low costs of production
- Low demand of government services (outside drought/famine)
- Low requirement for outside regulation
- Use of land unsuitable for agriculture

Because pastoral households prefer to consume milk for subsistence this has an important impact on herd structures with a predominance of females rather than beef animals (bulls and steers). O'Leary (1984) reported that the Rendille of Marsabit District (Kenya) keep a predominance of female animals in the adult herd/flock: 72% for camels, 79% of cattle, and 77% for sheep and goats. Pastoral herds and flocks are designed to produce milk, and high rates of reproduction, and to recover rapidly from shocks to the system (drought and disease). Offtake rates are therefore often low at around 5% per annum (Coppock 1994). This is in part caused by herd structure but also because there is a tendency to accumulate stock because they have potentially high returns (growth rates) although these returns are variable and subject to occasional shocks. It is also generally believed that those households entering a drought with high stock numbers are better able to survive the impact of the event and to recover more rapidly from it.

The extent to which there is potential to increase the offtake from pastoral herds is dependent upon existing patterns of stock marketing, pastoralists' strategies to cope with drought, their needs for cash and the availability of alternative forms of investment. In general, in Kenya and Ethiopia the market requires male cattle, goats and sheep for meat, and these are the animals that pastoralists are willing to sell. Herders only dispose of females when they are suffering severe economic and social stress (usually during drought). Male animals in the herd are sold or exchanged according to the need for cash. To some extent, most households are integrated into the market.

In the past none but the most wealthy herders had access to alternative saving instruments or investment opportunities and have therefore been less willing to market stock during periods of plenty once immediate cash needs are met. They have therefore tended to cling to their risky form of self-insurance.

Sandford (1983) observed little supply response from pastoralists to changes in prices for livestock and explained this by suggesting that in an environment where there is little opportunity to purchase consumer goods there is little demand for cash other than for essentials such as schooling and taxes. The reasons for this limited price responsiveness were not clear (they had not been investigated/researched) and may have been related to other income streams (milk) or to the social benefits of maximising herd size as well as a shortage of alternative investment opportunities. In general, pastoralists are more likely to value livestock as a source of income in kind (milk, reproduction and blood) rather than of cash. Under these circumstances these income generating assets will be held until income generating value falls below salvage value (during drought) particularly where there are limited alternative investments. This may partly explain the limited supply response of pastoralists to favourable market conditions (high prices).

## **2.2 Pastoral societies in transition**

African pastoral societies are in transition. Rising human populations and a decline in the ratio of livestock to people suggests that pastoral systems are increasingly under pressure to provide for the livelihoods of many pastoral households. Declining per capita milk

and meat production increasingly requires households to purchase grain and is leading towards greater integration of pastoral households into the market economy.

Another factor drawing pastoral households into the market economy is the availability of education for children and recognition of its value by their parents. Many households therefore need to find cash at regular intervals throughout the year to pay for school fees. At the same time there may be increasing demand for, and availability of, consumer goods.

Many pastoral societies also find that traditional movement is restricted by expansion of agriculture and protected areas. In some locations, for example Southern Ethiopia, key resources (such as dry season grazing areas) are increasingly being used privately for agriculture during the wet season (Coppock 2000). This coupled with declining livestock:human ratios increases the dependence upon the market for food (particularly for the poor) who must exchange a larger proportion of their herd to survive drought which may result in increasing differentiation within society (rich become richer, poor become poorer).

Trends in Borana pastoral system reported by Desta (1999 - Table 1) support a theory of pastoral societies in transition. It is clear, in Southern Ethiopia at least, that access to grazing resources and production (per household) are in decline, grain consumption is increasing, milk sales are of greater importance than formerly and that the need for cash is evident.

**Table 1. Trends in the Borana Pastoral System**

Perceived trends (317 herdowners)	Percentage who agree		
	Decreasing	Increasing	No change
Access to grazing	91	7	2
Milk for people	97	1	2
Standard of living	55	11	32
Grain in markets	22	76	0
Grain consumption	1	99	0
Milk sales	29	71	0
Human population	0	98	0
Need for cash income	0	99	1

Source: Desta (1999) cited in GL-CRSP Annual Report 2000  
(<http://www.glcrrp.ucdavis.edu/new.html>)

There is more pressure on pastoral households to generate and hold cash than ever before in order to survive in today's economy. Some form of financial services that allow pastoral households to deposit savings and borrow may be almost inevitable in the longer term, although a form of service suitable for a mobile population with little experience of the workings of the formal financial sector has yet to be devised.

### 3. THE IMPACT OF DROUGHT ON PASTORAL HOUSEHOLDS

Droughts or periods of unusually low rainfall are part of the expected pattern of precipitation in pastoral east Africa. Pastoralists deal with these fluctuations by moving their herds to areas of higher precipitation or to drought-time grazing reserves. The greater their flexibility the more able they are to survive drought (Blench 2000)

Several factors constrain this flexibility:

- The expansion of cultivation into dry season grazing resources
- Increases in human populations and increasing competition for rangeland resources (from agriculturists as well as pastoralists)
- Increases in livestock populations and greater competition for drought-time grazing
- Restrictions on movement across national boundaries
- Expansion of game reserves and national parks
- Political marginalisation and often limited understanding of the pastoral way of life by central governments (Hogg 1997)

#### 3.1 Drought losses

The literature provides a clear indication that losses of livestock during drought can be catastrophic for pastoral peoples (Dahl and Hjort 1979; Sandford 1983; Toulmin 1985; Hogg 1997; Coppock 1994). However, there is a shortage of scientifically derived data from the monitoring of actual herd size both pre and post-drought. Most commentators rely upon recall data from herders. Dahl and Hjort (1979) reported poor availability of stock census data for the major Sahelian droughts of the 1970s and the situation has improved little since that time. This is not to suggest that the data presented in the literature is erroneous, but rather that generalisations are often made about losses in terms of percentages of herds with little information about which type of stock survive and the impact this has on herd recovery post-drought.

It is also important to distinguish between local and regional droughts as the regional event may effect all herds and have a major impact on recovery (restrict stock transfers and sharing post drought) whereas the more localised event will obviously affect fewer herds.

Ellis *et al.* (1987) demonstrated that drought losses in Northern Kenya (Turkana) are associated with:

- sedentarization
- lack of access to dry season ranges
- dependence upon agriculture (risky in rangeland/semi-arid environment)
- high densities of livestock and people, relative to regional carrying capacities

Conversely good drought resistance is associated with:

- the availability of large and diverse ranges
- access to productive dry season ranges
- ability to move freely within these ranges (high mobility)

- low to moderate stocking rates
- high to moderate livestock units per person

Growing human populations, declining livestock:human population ratios and increasing sedentarization in African rangelands suggest that drought losses are likely to grow in future years.

The data presented in Table 2 demonstrates that drought losses for all species can be as high as 90% of the total herd or flock. Obviously much depends upon the severity (length) of the period without precipitation, the local or regional nature of drought and the mobility of people and livestock. More recent participatory research in Ethiopia, also using recall data from herders, may provide a more reliable picture (Coppock 2000) with reported losses for cattle at 40-60% of the herd.

Young stock and lactating females are more vulnerable to climatic shocks than mature males or dry cows. The drought of 1983/84 in southern Ethiopia resulted in losses of 45% of milk cows, 90% of calves and 22% of mature male cattle in the five encampments studied (Coppock 1994). Mortality of small ruminants was much lower (16%) with 15% sold and 7% slaughtered. The pastoralist risk strategy to deal with the susceptibility of certain classes of cattle is to hold hardy mobile males. Cows in milk tend to be kept closer to settlements (milk is needed for subsistence) and are not therefore as mobile as males. Males are hardy and mobile, as well as less likely to be needed for reproduction, and tend to be the first choice sold to purchase grain. During drought poor households must sell a higher proportion to purchase grains (or slaughter for consumption) as the household displays a lower livestock:human ratio.

**Table 2. Available drought loss data**

<b>Date</b>	<b>Event</b>	<b>Losses</b>	<b>Reported by</b>
1960-61	Drought Kajiado, Kenya	30% Masai cattle loss (est. value US\$7m)	Hutchison 1963 cited in Oba & Lusigi 1987
1962-66	Drought Botswana	32% drop in national cattle herd	Campbell 1979
1969-74	Drought Sahel	Cattle losses Mauritania 80% Senegal 50% Mali 50-80% Burkina Fasso 80-100% Niger 80% Chad 90%	Oba & Lusigi 1987
1970-73	Sahel drought	80% of cattle	Dahl and Hjort 1979
1972-73	Drought Niger	48% reduction in national cattle herd	Toulmin 1985
1973-74	Drought North Kenya	Calves and Old Cattle	Dahl and Hjort 1979
1973	Niger and Upper Volta	63% cattle, 47% sheep, 33% goats	Arnal and Garcia 1973
1973	Drought Ethiopia	88% of cattle, 69% camels	Dahl and Hjort 1979
1973-4	Drought Ethiopia	80% cattle, 50% sheep, 30% camels and goats	Ayalew 1980
1976	Drought Maasailand	20-30% of cattle	Campbell 1978
1979-80	Drought Turkana, Kenya	90% Cattle, 80% sheep & goats, 40% camels	Hogg 1983
1981-84	Drought Botswana	20%reduction in national herd	FAO 1984
1982-84	Drought Niger	62% loss of national cattle herd	Toulmin 1985
1983-84	Drought Ethiopia	90% of calves, 45% cows, 22% mature males	Coppock 1994
1983-84	Drought Mali	50-70% oxen, donkeys and horses	Toulmin 1985
1984-86	Drought Ethiopia	37% of cattle	Coppock 2000
1991	Drought Northern Kenya	Cattle 556,000 (28%) Sheep and Goats 723,000 (18%)	Surtech cited in Barton and Morton forthcoming
1991	Drought Ethiopia	42% of cattle	Coppock 2000
1999-2000	Drought Ethiopia	60% of cattle	Coppock 2000
No date	Model	90% calves, 40% heifers, 60% adult cows (Total 65%) 60%of female camels	Dahl and Hjort 1979

Losses in Wajir (northern Kenya) during the 1991/92 drought were estimated to be 128,000 cattle and 87,000 sheep and goats. The total value of these animals was estimated to be US\$6.9 million<sup>2</sup> (at 1998 prices). Famine relief for an average 120,000 people in the same District for 2 years during drought and flood 1996-98 cost US\$7.4

<sup>2</sup> Cattle estimated to be average of 120kg liveweight valued at Ksh25/kg, Goats average 15kg liveweight valued at Ksh25/kg. US\$1 = Ksh60

million (Barton and Morton 2000, Buchanan-Smith and Barton 1999). The value of livestock losses and the cost of relief are similar.

Coppock (2000) demonstrates, from data collected from 56 Borana households (Ethiopia) and 17 years of cattle herd dynamics (recall data), that the pastoralist cattle herd exhibits a boom or bust pattern associated with periods of gradual herd growth punctuated by drought-induced crashes. These crashes accounted for 37-42% of the cattle herd in the droughts of 1984/6 and 1991. He claims that Ethiopian Boran herds may have collapsed by up to 60% during 1998/99. When cattle population densities reach 30 head/km<sup>2</sup> the system is predisposed to a crash if rainfall fails and that this is predictable and provides a window of opportunity for asset diversification based on timely livestock sales.

Most of the available literature discusses the catastrophic impact of drought on pastoral households in terms of livestock losses. However, rarely have these losses been quantified at the household level and it is unclear if individual households are able to mitigate the impact of drought by marketing livestock. Equally the proportions of losses attributable to mortality and to forced sales is rarely examined, nor is the relation between forced sales and the extent to which individual households market cattle during periods of good access to grazing and water resources. Early analysis of results of participatory research in southern Ethiopia which investigated household herd history 1980-97 found that mortality on average accounts for more than seven times the gross reduction in herd size accounted for by sales (Bailey *et al.* 1999). Early indications are therefore that losses are much greater than sales.

It is generally believed that pastoral households maximise herd growth during inter-drought periods. If pastoral communities are to be encouraged to develop savings mechanisms, other than those associated with the accumulation of livestock, there is a need to know what their capacity for saving is and how many animals can be removed (sold) without compromising household subsistence.

### **3.2 Are large herds an effective form of insurance?**

The literature of the 1970s does not provide clear guidance as to whether larger herds provided greater insurance against the impact of drought (Toulmin 1983). The literature is also divided about the redistributive effects of drought (in terms of livestock assets) or whether poorer households were automatically impoverished (Dahl and Hjort 1979). Toulmin (1985) argues that drought brings about important changes in the distribution of wealth as a result of the differing capacities of producers to protect themselves and their assets in times of crisis.

Berg (1975) reported a levelling impact of drought throughout the Sahel during the early 1970s. Larger herdowners suffer larger losses and during widespread drought there is little that any herdowner can do to protect their livestock. Toulmin (1983) suggests that it is likely that wealthier households have the ability to be more mobile and call on other resources to support their livestock. Therefore mobility may not be the only prerequisite

for herd survival. Access to cash and credit may also be important and assist with water and fodder purchase. Also, much depends upon availability of family or other labour which permitted mobility. Labour availability is usually related to household size although stock-wealthy pastoralists are able to hire non-kin labour, as well as increase household size through marriage, etc.

Recent thinking suggest the impoverishment of pastoralists is the cumulative effect with poorer households falling out of pastoralism (Lybbert et al. 2000) partly because of population increases and the declining livestock:human ratio (Hendy forthcoming). Lybbert, et al argue that accumulating a large herd appears to offer reasonable insurance of surviving on the range (recall data was gathered from 55 randomly selected households in southern Ethiopia for the period 1980-97).

Hogg (1997) agrees that the rich survive drought better than the poor but does not attribute this survival to the size of livestock holdings. Richer households may also have political influence and preferential access to grazing, water, credit, veterinary services etc. Larger households may be more able to diversify their activities during drought by shifting to farming, trading, or migration, which enables a household to support itself and rapidly recover post-drought.).

Sieff (1999) argues that wealthier households in the Datoga agro-pastoral system in Tanzania are not necessarily determined by actual or per capita animal ownership. Social networks may have greater importance and may provide access to resources during difficult times (drought).

Livestock wealth alone may therefore be a poor guide to the potential ability of a household to mitigate the impact of drought. Access to other resources may be of greater importance (access to savings and credit, preferential access to water, animal health and marketing facilities).

### **3.3 Commodity production by household type**

Marketing of stock and milk provides household income and enables families to purchase a range of goods and services. Sikana et al. (1993) argue that traditionally African pastoralists have regarded milk and dairy products as subsistence products, and animals for sale or slaughter as commercial products. This may be changing with increasing specialisation (a shift to commodity production).

Larger herd owners can more easily switch from subsistence reliance on milk to a grain-based diet. They can utilise more milk for consumption by calves, producing healthier, more valuable animals. Furthermore, the herd size and capital resources of the wealthier enable them to withdraw from the market when prices are low. This was born out by a study of Kenyan Maasai (Grandin 1988) who found poorer households milking 100% of lactating cows, and the wealthy only 40%. This trend has also been noted in Nigeria (Waters-Bayer 1984) and Darfur, Sudan (Behnke 1985). In the latter case a strategy is named *matruuka*, whereby male calves are specifically selected to have all their dams'

milk. A further phenomenon is the splitting of herds specifically for milk and beef 'investment.' This was noted amongst the Kenyan Orma, where breeding decisions were also changed to favour beef production.

For the wealthy, these strategies provide the possibility of balancing relative advantage from the two enterprises without compromising the efficiency of either. For poorer herders, milk production is a subsistence mechanism, and for the poorest, the calorific advantage of milk/grain exchange makes this even more so. Thus dairy marketing amongst the poor has assumed increasing importance through commercialisation. This in turn has an effect on mobility and sedenterisation, with the poorer needing to reside relatively closer to milk markets. Richer households can gain advantage from mobility to better pasture, and additionally, as in Somalia, have enough milk to deal with 'abaakar', mobile milk buyers. The latter, absorbing transport costs and profit, offer lower prices, but the wealthier herders can afford to sell surplus milk while building their beef herds.

A further differentiation exists among species in various cultures. The most clear example is that of Somalia, where 80% of milk is from camels and cattle are exported (to Saudi Arabia and the Gulf) as either beef or live animals (Little 1989).

Thus, settlement is not a necessary corollary for dairying, at least for the wealthy although the poor may settle in order to take advantage of the milk/grain ration exchange. Increased specialisation offers potential for higher commercial livestock off-take for meat (from wealthier households) but increasing sedentarization and possibly environmental destruction and dependency by milk producing poorer households.

### **3.4 Marketing behaviour**

Annual losses in inter-drought years for pastoralists are often 10-20% caused by dry season fodder shortages and disease. Despite these losses sales rarely reach 5% of herd size in average years (Coppock 2000). Given the potential for losses to disease why are not more animals marketed before they succumb?

There may be several reasons for this apparent reluctance to market more stock:

- A declining livestock/human ratio (fewer animals per household)
- Traditional values remain oriented towards livestock accumulation
- Lack of markets and market information
- Lack of access or knowledge of, alternative investments to livestock

The marketing behaviour of Rendille and Gabra in Marsabit District in the early 1980s is documented by O'Leary (1984). O'Leary sees a fundamental shift in diets and livelihood strategies involving regular livestock sales to allow cereal purchases as having taken place for both groups in the 1940s. By the 1980s sales of smallstock were significant, but Gabra at this point were spending less on cereals, and had a higher ratio of slaughters for home consumption to sales. At this point in time, O'Leary saw pastoralists (of both groups) as deterred from marketing more stock because of low livestock prices, the

absence of credit and savings institutions, and unstable cereal markets - which encouraged them to keep a reserve of males for droughts.

### **3.5 Marketing during drought**

As animals begin to lose condition at the onset of drought, pastoralists seek to offload unproductive stock, livestock prices fall and cereal prices rise along with other staple foodstuffs. Terms of trade between products that livestock owners sell and the goods they buy worsen and livestock producers' real incomes decline. Traders may benefit initially from low livestock prices but soon find with the market glutted that they are unable to sell poor quality animals and trading ceases.

These circumstances can have a devastating effect upon the human and livestock populations of pastoral areas with high losses of livestock, and serious hunger and malnutrition among the human population.

It is not known to what extent pastoralists are willing to market stock at the onset of drought. Although most households probably wait until milk yields begin to decline or animals lose condition before they show an interest in marketing stock. Barton and Morton (forthcoming) suggest that pastoral communities in northern Kenya are willing to sell at the onset of drought but face logistical difficulties such as:

- Distance to markets
- Little grass on trek routes therefore problems with weight loss when moving animals to market
- Poor contacts with traders who tend to be based in urban centres near markets and not in more remote locations
- Traders have little knowledge about who wants to sell and the location of animals
- Insecurity, traders unwilling to carry large cash sums into rural areas

Experience suggests however, that when these difficulties can be overcome and agencies subsidise transport for traders and act as intermediary between buyers and sellers then cattle in good/reasonable condition will be marketed. The cash generated reduces the need for costly famine relief (Barton and Morton forthcoming). Interventions such as these have only been attempted in a limited number of localities and scaling up during a major drought may be difficult given the numbers of households and animals involved.

There is also a shift during drought in the types of animals marketed, for example, among the Borana the female off-take as a proportion of male rises from 25% in normal years to 43.5% in drought years (Cossins and Upton 1987).

Sieff (1999) examined the household and herd dynamics of a small population of Datoga agropastoralists in Tanzania. Cattle are rarely slaughtered for food, although animals which die of natural causes are consumed. Most disposals are for cash, which is vital for dry-season grain purchase when milk yields are low. Cattle losses are quantified as death (51.6%), and sale (42.5%) with the remainder either slaughtered or given as gifts. Drought sales are often of female animals with adverse effects on herd rebuilding. The

income generated by livestock sales is primarily used to buy grain and veterinary products and little is re-invested in livestock, or saved (deposited in a bank). High off-take rates of cattle are not a sign of increasing commercialisation but are caused by poverty and subsistence stress.

#### **4. CONTINGENCY AND DEVELOPMENT PLANNING**

Drought and the availability of grazing and water dictate the boom and bust nature of African pastoralism. It is generally agreed that some form of marketing of livestock, either at the onset of drought or during times of plenty (inter-drought years) is required to assist pastoral households buffer the effects of climatic shocks. However, the limited number of alternative investment opportunities in African rangelands compromises this strategy.

Until recently drought management has emphasised:

- Early warning systems to assist government agencies to prepare for drought
- Emergency destocking and marketing:
- The provision of famine relief
- Restocking of destitute households (although the number of households benefiting have been very small)
- Assistance with water provision (pumps and fuel)
- Opening of holding grounds/private ranches and national parks

Although food relief saves human lives it has the effect of encouraging herdowners to keep rather than sell their stock as their subsistence is guaranteed. There is therefore an inherent contradiction between the destocking or marketing approach and the provision of food aid. One way around this would be to offer food relief in exchange for livestock, although poor households would be required to liquidate a higher proportion of their stock. Examples of exchanges of food (grains) for livestock were not uncovered by our literature search. Each contingency measure is less than perfect which has led to the development of the pastoral banking concept to engender self-reliance in pastoral communities (Coppock 1994).

##### **4.1 Pastoral banking and saving**

The inter-drought cycle as described by Coppock (1994) is characterised by the recovery of livestock populations post-drought and relatively high densities of livestock. The combination of a high stocking rate and low rainfall (drought) results in a population crash. This crash may be precipitated by high stocking rates (higher human population and livestock densities) as much as by variations in rainfall. Without the drought-time grazing refuges that were available to pastoralists 30-40 years ago (and earlier) the drought-induced crash may be worse than previously. The high livestock density phase is therefore the time where a risk management strategy should be introduced involving increased rates of cattle and other livestock sales and the banking of capital.

There are no reports in the literature of attempts to establish alternative investment opportunities for pastoralists to encourage sale of unproductive male cattle and provide funds for purchasing food grains during dry seasons or drought, although this is what pastoralists do to a limited extent, (i.e. sell unproductive cattle during dry seasons or droughts with which to purchase grains). During drought time they invariably sell their stock too late and generally do not make contingency plans for the event. All households attempt to sell at the same time, flooding the market and prices fall as the market is oversupplied and the quality of animal deteriorates.

Coppock (1994) estimated that in Ethiopia, given the terms of trade for livestock during the 1980s, if the value of animals during the inter-drought period had been realised and cash banked and withdrawn to purchase grain during droughts, households would have on average liquidated only one third of their animal assets otherwise needed (at drought prices) to purchase grain to endure a 2-3 year drought.

Wealthier pastoralists almost certainly have bank accounts, particularly those involved in trade/shopkeeping, as well as absentee herdowners who divert resources from other business into livestock. But it is not even clear whether this group sell surplus stock during periods favourable for animal production. In principle many pastoral households can realise relatively large amounts of capital very quickly during times of plenty (as opposed to arable producers).

#### **4.1.1 Formal and informal institutions**

Institutional impediments to saving are identified as a crucial element along with a lack of formal institutions. Nissanke and Areetey (1998) note the importance of high transaction costs, particularly in remote areas, and that rural savings mobilisation is not necessarily positively correlated with the number of bank outlets. Most attempts to introduce rural banks in Africa have proved unsustainable. Consequently the informal sector remains prevalent, but often involves very specific groups to the exclusion of others. Ethnicity, religion and age are among the qualification/disqualification criteria.

Geographical barriers to innovative rural credit/saving schemes has proven a major constraint, with transaction costs being high even when the deposit-taker travels to the depositor; the transport costs are necessarily passed on to the customer. There is an incentive therefore to keep the institutions in population or market centres, where the cost of travel is borne by the depositor. Seasonal movements of pastoralists and their herds obviously add further to transaction costs.

Ndofor (1998) argues that cash is a more flexible medium of exchange than livestock which in theory should allow the household more flexibility during drought. However, in Ethiopia the following were mentioned as constraints to saving/banking by pastoralists:

- The distance to towns with bank branches
- The intimidating nature of the formal sector (which has little sympathy for the needs of pastoral people)
- The need for minimum deposits or balances

- A lack of awareness about how a bank operates and the services they provide

Institutional and cultural constraints include:

- Donor and government intervention (famine relief) during drought crises, which engenders a culture of dependency in pastoral populations
- In Ethiopia pastoralists have witnessed revolving funds for veterinary drugs disappearing because of poor control and supervision (Ndofor 1998) and may be reluctant to become involved in saving and credit schemes
- Proximity of national borders and the danger that those responsible for managing funds may migrate with the funds
- Traditional lending of stock to relatives/friends who have become destitute (although this is reported to be dying out in Southern Ethiopia (Ndofor 1998))
- Muslim non-acceptance of interest
- Physical security of funds mobilised in pastoral communities

Some pastoralists in Northern Kenya and Southern Ethiopia already use trusted friends/shopkeepers as savings and credit institutions. If they sell animals they then deposit money with a shopkeeper and later withdraw money in cash or goods (Ndofor 1998; Buchanan-Smith and Barton 1999). Shopkeepers may also offer credit in kind or cash to be repaid when the next animal or animals are sold. Pastoralists who market large stock can receive large amounts of money and need a depository for safekeeping. Shopkeepers/traders having contacts in towns are able to bank on pastoral households' behalf. Unfortunately pastoral households using these informal arrangements may pay high prices for goods and receive low prices for stock using and may be unaware of the cost of their borrowing. It seems likely that the shopkeeper will make a charge for credit although this has not been investigated. As there are limited alternatives these informal institutions do provide banking services of a kind. However there have not been any investigations of these forms of credit and saving in northern Kenya.

In the African pastoral context there is a need for information about:

- National policies and legal frameworks with regard to credit union development and micro-finance.
- Potential complementarity between micro-finance and the formal banking sector. Are there links, which would help to overcome the difficulties associated with depositing cash?
- Whether NGOs and CBOs (pastoral associations) are involved or interested in developing credit, finance and savings institutions and providing management and training.
- The potential demand for credit and other financial services from pastoral households
- Pastoralists' confidence in formal sector financial institutions

There is also a need to establish whether:

- There are significant surpluses of males or unproductive females that could be sold during times of surplus production (inter-drought years)

- Bank accounts or community based saving schemes in depreciating developing-country currencies represent a better real return than livestock, having factored in periodic drought losses
- Bank accounts can contribute to cultural/social prestige (in a similar way to livestock)
- Non-livestock saving will impact on traditional coping mechanisms (sharing, lending livestock).

#### **4.2 Micro-finance and livestock production**

Micro-finance has been demonstrated to be effective in India and Bangladesh for livestock production and very poor households (often female headed) prefer to use their loans for livestock (in preference to agriculture). There is evidence to suggest that investment in livestock leads in the longer run to the accumulation of other assets (Todd 1998). Although this environment is very different to pastoral Africa the experience demonstrates that livestock production is compatible with credit although whether this model can be transferred to a mobile/nomadic, transhumant population has yet to be tested. The success of micro-finance on the Indian sub-continent has been associated with the regular visits of trainers and project workers and regular savings and loan repayments, which has aided loan recovery. It may prove difficult to establish this kind of close relationship with a mobile population. The group approach where members provide collective surety may be the best approach and a viable alternative to both high cost private credit and unsustainable public sector schemes, but again, whether this can function in a pastoral system has not been tested.

#### **4.3 Formal credit schemes**

Credit provision has played a significant part in the expansion of improved crop technologies in Africa, but has not made an impact in the livestock sector. Ade Freeman et al. (1998) conducted case study research in Ethiopia, Uganda, Nigeria and Kenya, and discovered that livestock credit accounted for under 10% of total agricultural credit in the three countries. Most credit was found to be used for the purchase of improved breeds for dairy production and none was associated with pastoral production.

## 5. DISCUSSION

Transhumant or nomadic livestock production is one of the few livelihoods possible on rangelands, which are unsuitable for agriculture (in the absence of irrigation). It is generally accepted that pastoralist tracking strategies, mobility and herd maximisation goals are rational in the environment in which they operate (although there is little concrete evidence that maximisation reduces risk in the longer-term).

The drought/recovery cycle is now well understood by governments, international agencies and donors who are often able to respond rapidly to humanitarian crises. However, drought may still be regarded as a humanitarian problem with less emphasis on the development of policies to mitigate its consequences and to prevent the cycle of boom or bust repeating itself (Blench and Marriage 1999). Many responses to drought treat the consequences and not causes of destitution and famine. Food aid and famine relief, while essential to save human life, contribute to sedentarization, environmental damage and dependency. Formerly, destitute households would have been forced to migrate elsewhere and/or adopt alternative subsistence strategies<sup>3</sup>.

It is clear that pastoralists while able to diversify to a degree their income generating activities often continue to rely upon livestock for their subsistence and cash needs (Little, et al. 2000). Unless they have access to alternative saving instruments so that they can liquidate livestock if they fear losing animals to drought or disease for example, they will tend to cling to their major assets despite the fact that they are highly imperfect forms of self-insurance. Although storing animals is not difficult during times of adequate fodder supply, during drought they can become a liability. An alternative is therefore needed when fodder and water are in short supply.

### 5.1 Herd dynamics and drought losses

This review has identified that there is a need for further research into pastoral herd dynamics. It would be useful to have reasonably reliable data for planning and development purposes on herd growth, losses and number and types of animals marketed over the past 20 years and to what extent households have become integrated (or otherwise) into the market economy. This type of research will provide important information for the investigation into ways of managing risk in arid and semi-arid pastoral production systems and indicate to what extent traditional coping mechanisms contribute to risk reduction.

The current orthodoxy is that families with larger herds are better able to survive drought. But there is little concrete evidence for this, and larger herds require more fodder, which may lead to greater competition for fodder and higher mortality. There is a need therefore to examine (using household recall information) drought losses and marketing behaviour of pastoralists with small and large herds. Those households better able to

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<sup>3</sup> It is acknowledged that migration is not necessarily the solution as destitute pastoralists may require food relief even if they do migrate.

survive drought may have access to reserves of labour, be more mobile and have access to other non-livestock assets.

This review of literature has revealed that research on drought loss has been very much an exercise in ‘counting heads’ rather than a thoroughgoing attempt to link models of livestock loss with the overall impact on pastoral societies. For example issues of gender disaggregated impact, sedenterization, shifts in herd composition, environmental degradation etc., tend to be examined in separate studies which reflects the failure to adopt a more inclusionary approach.

Recent research and development activity by the World Bank-funded Arid Lands Resource Management Project in Kenya and the Global Livestock CRSP is to be welcomed for the attempt to broaden and clarify such issues as wealth differentiation and diversification. Livelihood diversification is an essential coping strategy for many pastoral households whose aim may or may not be to rebuild herds. The strategies adopted to deal with drought loss are, it is now apparent, considerably more sophisticated (particularly but not exclusively among the ‘wealthy’) than earlier development work with pastoralists suggests.

## **5.2 Pastoral banking**

One potential solution to risk management in pastoral areas of Africa is banking. In theory the rapid removal of stock at the onset of drought, or the marketing of surplus animals during inter-drought years, and the holding of cash savings by pastoral households would produce the following:

- A reduction in demand for forage at the early stage of drought
- Conservation of the monetary value of cattle
- A post-drought pool of cash for restocking

There is a need therefore to investigate further:

- The prevalence of informal banking and credit arrangements
- The use of formal banks
- The potential for the development of savings clubs and micro-credit to mitigate the impact of drought and to fund post-drought recovery
- Herd dynamics to establish whether there is a surplus of unproductive animals during inter-drought years
- Whether formal saving accounts can provide sufficient growth to compare with livestock production (over the drought cycle).

An understanding of livestock as social capital must inform any attempts to introduce non-livestock forms of saving. Social capital dimensions can contribute to the reluctance of those who can accumulate, to save or invest in banks, but may also produce disbenefits for the poor who would otherwise have benefited from stock loans or transfers.

Traditional coping mechanisms also play a role in survival during drought (wage labour, firewood and charcoal, migration, poultry, gum arabic etc) and the significance of these cannot be ignored.

Innovative approaches to commercial off-take need attention and study, even as 'traditional' pastoralists themselves are balancing the income generating benefits of meat and milk production. A better developed understanding of pastoral household concepts of ownership, wealth, private, communal and commercial assets is required before banking and credit can be introduced with confidence to these societies. Nevertheless, and there are signs of increasing specialisation (dairy and beef) and commercialisation and increasing integration into the monetary economy does hold the prospect of genuine credit and savings institutions developing at the local rather than central level.

### **5.3 Sustainable livelihoods**

There is interest from donors, lenders and governments in pastoralism as a sustainable livelihood and one of the few viable means of living in arid environments. There is a distinct lack of information however, upon which to develop policy in the fields of:

- Drought losses
- Marketing
- Financial institutions (formal and informal)
- Savings

This partly reflects the more recent literature that emphasises the rationality of pastoral production systems and coping strategies. These are no doubt effective, being based upon generations of experience, but are under pressure as livestock:human ratios continue to fall. Under these circumstances there is a need to reassess the role for savings and financial institutions for pastoral households and the manner in which pastoralism contributes to the generation of different forms of capital assets. Livestock owners may need these institutions to survive but increasingly they will also be important for those households who have ceased to rely on livestock for their livelihood and have diversified into other income generating activities.

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