CONCEPTUALISING ECONOMIC CHANGE IN PASTORAL SOCIETIES UNDER PRESSURE

With four Kenyan case studies: the Pokot, the Maasai, the Somali and the situation in Marsabit

Ton Dietz, Abdirizak Arale Nunow, Adano Wario Roba and Fred Zaal*

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Abstract: To understand economic changes in pastoral societies, in response to population growth, resource degradation, and changing economic and political contexts, it is important to apply a number of key concepts: TLU/capita, caloric terms of trade, and overall and commercial offtake rates being the most important ones. This is illustrated with the outcome of four case studies in Kenya, done during the 1990s in collaboration between the Amsterdam Research Institute for Global Issues and Development Studies (AGIDS) of the University of Amsterdam and MUSES.

Key words: pastoralism, crisis, TLU/capita, CToT, offtake rates, commercialisation

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1 CONCEPTS

1.1 Commoditisation, commercialisation, offtake rates and sustainable land use

With fluctuating emphasis, throughout the 20th Century, scholarly and policy attention for pastoralism in Africa was often guided by feelings of horror about perceived ‘overgrazing’, self-destruction of the pastoral habitat, and unsustainable land use in pastoral areas. Concepts like ‘desertification, and the ‘tragedy of the commons’ were fed by statistics about ever growing numbers of livestock and people in a shrinking and degrading pastoral area. Often, the ‘way out’ was seen in vigorous attempts to convince or force pastoralists to sell animals and to make better use of the market (see Fratkin 1997 and Dietz & Mohamed Salih 1997 for an overview). This paper does not deal much with the ‘sustainable land use’ side of the argument as such, but it deals with a contextual variable that is very much related: the reality of pastoral commercialisation. It tries to develop theoretical concepts to look at the embeddedness of pastoral societies in the wider market and its pros and cons; its necessities and dangers.

The process of commercialisation of livestock and livestock products in a pastoral society is part of a wider process of commoditisation, that took place in most pastoral societies in the world during the second half of the 20th Century.

Commoditisation is a process whereby assets, goods and services increasingly change from having a use value, to be used for subsistence for the producers and their consumption units, into having an exchange value as well, to be sold and acquired on the market. At first this exchange may take place without money as barter trade, but soon it will often be with money as an intermediary. In the debate about pastoralism the following elements of this process should be highlighted:
- the commercialisation of livestock production (through the sale of milk, meat, wool, hides and skins, manure, draught animals) takes place when the balance between own use and sale changes in favour of the latter; and local livestock trade becomes part of (inter)national trends in supply and demand, with impact on price formation;
- the acquisition of food through the market becomes important; a change often accompanied by a change in the diet from more livestock based to more grains based;
- the acquisition of non-food consumption items through the market, both material goods (often starting with ornaments and clothing; items for the house; medicinal drugs and stimulants) and services (education, health care) takes first place;
- inputs to be used in the production process may increasingly be purchased (buying of water or land use rights, veterinary medicine, salt, additional feed; fencing materials; breeding animals or semen). One could in some cases also add: the buying of firearms and ammunition to defend or acquire property and rights of access;
- the privatisation of ownership of land, water sources, salt licks, vegetation, and restriction of access or use rights of formerly communal, state or ‘open access’ resources;
- the commoditisation of labour relations takes place when a growing part of the pastoral production and livestock marketing work is being done by labourers, for a wage.[1]

The debate about pastoral commoditisation in Eastern Africa has long been dominated by 'livestock commercialisation' and 'offtake rates', often motivated by the growing demand for meat in the ever more dominating non-pastoral sector of the economy of the three East African countries (e.g. Aldington & Wilson 1968), and not so much as a possible answer to growing tensions in the pastoral economy itself. The government drives to better 'tap the livestock wealth' of the pastoralists came in waves: a first one in the second half of the 1930s, provoking the famous Akamba Political Protest against forced destocking in 1938 (cf Forbes Munro 1975) and failed attempts to develop stock auctions; a second one in the second half of

[1] There is a complex debate going on about the type of wage, because in so many cases the ‘wage labourers’ get their rewards in non-monetary forms (e.g. food or livestock wealth) and also many of them do have family ties or age-mate ties or clan ties with the ‘employer’ in various forms of patron-client relationships.

the 1950s, again often using ecological argumentation to force a higher offtake rate (e.g. on Karamoja, Baker 1967, Evans-Jones 1960, Quam 1978; for Kenya: Raikes 1981) and a third one with the launching of the World-Bank financed livestock development programmes in the late 1960s and early 1970s (e.g. in Kenya the Kenya Livestock Development Programme). Often the concept of ‘offtake rate’ was used in a very restricted way. It was defined as: the percentage of the herd that annually enters the commercial market and is registered as such. This limited concept of ‘commercial offtake’ often obscures the understanding of the ‘total offtake rate’, which is the percentage of the herd that leaves the herd, because of a) slaughter, b) accidents and disease, c) ritual killing and sacrifices, d) gifts, e.g. as part of marriage arrangements, or as part of social security arrangements, e) sales for purposes of slaughter and f) sales for other purposes (fattening elsewhere; draught power elsewhere; breeding elsewhere). This is not the same as ‘biological offtake’, which does not include points d and f; and it is not the same as ‘commercial offtake’ which only deals with points e and f. If we assume that, in a pastoral setting, female cattle on average reaches an age of between 12 and 15 years, and male cattle dies at a younger age, because of earlier slaughter or sale for slaughter, we may state that the ‘normal offtake rate’ in a pastoral cattle herd is between 8 and 12% per annum. For a flock of sheep or goats it may be up to 25%, for camels it may be between 5 and 10% (the best analytical text on this issue is still Dahl and Hjort 1976).

Scholars looking from the perspective of pastoralists to government-led drives to increase commercial offtake rates often complained about 'unfair terms of trade'. Especially in the early 1980s there was much scientific work on economic unfavourable relationships of pastoralists with the wider economic world. Raikes (1981, p. 97) blamed East African governments because the pastoralists' "reluctance (to sell livestock) is at least in part due to low prices". Evangelou (1984a, p. 140) wanted "more favourable national pricing policies" for livestock and he added (1984b, pp.50) that the transition to market-oriented production has been hindered because the Kenyan government succumbed to "short-term political advantages gained by 'cheap meat' and other urban-biased policies". Campbell and Axinn (1980, pp. 7-8) wrote: "official prices of beef, in particular, have remained controlled and low during the past 15 years in Kenya". Aronson (1980, p. 181) speaks about a "sharp decline in the terms of trade, so that more and more livestock product is necessary for a given amount of grain or industrial goods". Hjort (1981) cited Swift (1979) and Kjaerby (1976) to suggest a decrease in exchange ratios for cattle and camels against maize. And also Little (1983) was convinced that "in recent years... the rate of inflation for consumption items (particularly maize and finger millet) has increased faster than livestock prices, eroding the purchasing power of the herdowners". Elsewhere we already questioned the wisdom and empirical basis of this negative attitude towards pastoral commoditisation (Dietz 1987,1993; Zaal 1998).

1.2 Caloric Terms of Trade

a. independent subsistence production

Pastoralists who produce milk, meat, or blood for their own consumption with the aim to be self-supporting in the provision of food, need enough animals to do so. The absolute amount of food needed to provide energy as well as proteins, minerals, and vitamins is generally dependent on household composition (children-adults; men-women, number of breast-feeding women), on the average weight and the body efficiency to handle food, on the climate and on the type of often work-related energy requirements. People can do with temporary lower energy inputs, but at a certain point bodies become 'wasted' and death or long-term damage to the body is a result. The food people produce from their herds and flock has a certain caloric (and protein etc.) value, which can fluctuate a bit per unit of weight, mainly depending on the fat contents of milk and meat.

Assumptions:
- An average person in East African pastoral circumstances needs 800,000 Calories per annum.
- A household unit consists of seven people who need 5.6 million Calories together.
- A litre of milk contains 700 Calories
- An average (zebu) cow gives 400 litres of milk per annum for human consumption (there is competition with milk for the calves and milk production for human consumption will generally be between 2 and 3 litres per day in the short rainy season and between 1 and 2 litres per day in the long dry season)
- Cows form 60% of the cattle herd
- A kilogram of beef contains 2,300 Calories (goat meat lower, sheep meat higher)
- A zebu has a consumable meat weight of 100 kgs on average; a goat 15 kg.
- The natural life of zebu cows is thirteen years, and the culling of most male animals is at three to five years, which results in an average life span for all new-born male and female calves of eight to nine years. That would mean an average 'normal' offtake rate for cattle of 11-12.5 per cent per year.
- A pastoral household unit can manage a herd of 30 to 40 cattle without labour problems; to team up with other herders and their herds for seasonal mobility is often useful for security and labour efficiency reasons. Beyond 40 animals per herding unit additional labour is often required.

Conclusions:
- If the average pastoralist would only drink cattle milk he or she needs 1140 litres of milk in a year, that is 8,000 litres per assumed household unit, requiring 20 cows or a total cattle herd of 33 animals (assuming that milk can be stored and/or production evened out).
- If the average pastoralist would only eat beef he or she would need 350 kg of meat in a year and the assumed household unit 2,450 kg, requiring 25 cattle to be slaughtered for food. In a 'normal' situation, with an offtake rate of 11-12.5 %, this would require a cattle herd of at least 200 animals.
- Combining the milk and meat production, full dependence for all food requirements on animals would mean that a pastoral household needs a cattle herd of at least 28 animals (producing 6,720 litres of milk and 350 kgs of meat). This is within the labour potential of an average household production unit. It would mean an average of 4 head of cattle per capita or 3 TLU/cap.[2] The concept of ‘(tropical) livestock unit per capita’ is crucial to understand the predicament of any pastoral society.

Complications (beyond the ones which result from the fact that 'averages' are of course only analytical tools, and can be far from individual households' and herds' situations) are:
- A large seasonality in milk production would require dependence on other food sources during part of the year, or an adequate storage of milk. In pastoral societies, the 'hunger period' is generally during the dry season when milk gift is lowest and the amount of labour energy that is required is highest.

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[2] The unit most widely used in Kenya (Peden 1984, Bekure et al. 1991; Kilewe and Thomas 1992; 77): 1 TLU = 1.42 heads of cattle, 10 hair sheep or goat, 1 camel

- The assumed 'normal' offtake rate for cattle is based on the assumption that all animals end up as meat for the household. However, part of it is not eaten, either because of losses due to predators, disease or sacrifices, or because of taboos concerning the consumption of certain animals.
- The assumed 'normal' offtake rate for cattle is based on a 'natural' life for cows, but on culling of (most) male animals as soon as they are adults. This might not always be possible because of cultural requirements in which male animals are allowed to become older, e.g. because of shared ownership with far-away stock friends and cultural taboos against early slaughter (or sale). When oxen are required (or in demand) as draught power the average age of death of male animals goes up as well.
- With regular droughts, animals die of starvation and/or lack of water, and these animals are either not eaten (they go to waste) or they have lost a lot of weight (and all their fat) so that the food value is lower, if they are eaten at all. In a first drought year lower milk production will be compensated by higher meat availability. In a second consecutive drought year food problems become severe.
- Cultural norms prescribing dietary behaviour might complicate the food (milk and/or meat) entitlements of particular members of the household.
- Even if certain households have herds big enough to provide them with milk and meat during dry seasons and droughts, other households might be faced with structural or temporary food problems, and customary sharing of meat and milk among a larger group than the own household may still jeopardise the household food situation of the rich households as well.

b. production with minor commoditisation

In many pastoral regions in East Africa, population densities have increased because of natural growth, immigration of pastoralists from elsewhere (Maasai from Uasin Gishu and Laikipia to Kajiado and Narok; Boran to Marsabit from Ethiopia; Upe Pokot to Kenya; Somalis from Somalia to Kenyan Somali areas), and of non-pastoralists pushed out of the high-potential areas (see Dietz 1986). It is generally assumed that long-term pastoral population growth since 1960 has been (much) higher than livestock growth, partly because of the devastating consequences of the droughts (in most Kenyan pastoral areas in 1960-61, 1965, 1968-69, 1974-76, 1979-81, 1984-85, 1987, 1989, 1991-93, 1996-97), preventing the rebuilding of herds and flocks. On the other hand it is probable that the total absolute number of animals in the pastoral areas of Kenya is higher now than it was in the ‘boom period’ of the 1950s. On the whole, the overall trend of livestock per capita has been downward. For many pastoralists it must have meant a loss of wealth to a level below the requirements for subsistence production.

There are a number of options to avoid a food crisis when the pressure grows. Of course the pressure is mostly felt during periods of drought (see Dietz 1991).
- Pastoralists have always participated in marketing during these periods, e.g. selling or bartering milk, hides and skins, or hunting trophies and getting non-livestock food in exchange (e.g. Schneider 1981; Kerven 1992).
- They also try to get additional food by hunting and gathering (or by stealing food from neighbouring cultivators), even if it is often regarded as culturally taboo.
- Using patches of land where cultivation is a possibility (e.g. ‘wetlands in drylands’), some also start to grow their own food, starting with what sometimes is called 'hit and run' cultivation of millet or sorghum, sometimes intensifying to more labour-intensive forms of rainfed or water harvesting types of agriculture. The problem is that during years in which

droughts cause most stress in the livestock economy, also the chances of a harvest are meagre. However, in years with adequate rainfall, the cultivation of cereals by pastoral households enables the livestock to recover more quickly. On the other hand there is a growing problem of access for pastoralists to the few niches where cultivation is possible, because these have gradually been occupied by non-pastoral immigrants or former pastoralists.
- Often relationships with groups in higher potential areas are formed by marriages, especially when the exchange is within the same ethnic community. Bridewealth arrangements then often include livestock as well, which is sometimes retained as part of the son-in-law's herd in the pastoral lowlands, but owned by the highland-based father-in-law.
- These relationships often form the basis of temporary migration of women and children to these higher potential areas (which in Kenya are often the 'highlands'; in other areas they may also be riverine areas). Migration is one of the important ways of reducing the energy requirement of households in dry areas during droughts.

c. *market-intermediated reproduction using the positive terms of trade between livestock and grains*

Growing tensing between pastoral production capacity and household consumption needs can also force a more active involvement in the market economy. Selling a steer or milk on the market and buying cereals instead could be a much more lucrative affair, as long as the 'Caloric Terms of Trade' (Tc) are good for the livestock owners. This Tc relates pastoral production, expressed in energy values, with pastoral consumption of cereals, also expressed in energy values, through the price of the respective products and their energy value on the market.

Assumption:
- One kg of maize or sorghum provides between 3,000 and 3,600 Calories (say 3500), depending on milling and storage losses.

Conclusion:
- For the exchange to be positive in caloric terms the pastoralist should be able to get more than 65 kgs of cereals for selling a steer, and more than 200 grams of cereals for a litre of milk[3].

Complications:
- Pastoralists who become (ever more) dependent on the market, should be able to rely on three things:
  a) there should be traders willing to buy the animal or the milk at the time when the pastoralist is in need of cash to buy food, and at a market place that can be reached without too many problems (trekking distance, security for animals and herders against raiders and greedy civil servants, health risks);
  b) there should be traders willing to sell food at the time when the pastoralists want to buy it and at places which are accessible for pastoralists at low costs and with low risks;
  c) the pastoralists should have animals to sell, without jeopardising the sustainability of the herd; and the Tc should be reliably lucrative (>1).
- It is not always obvious that urgent or foreseen food needs in the household will be covered by the sale of animals or milk for cash to buy cereals. Decision-making is often gender

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[3] 3A steer = 100 kg of meat * 2300 Cal = 230,000 Cal. This is equivalent to 65 kg of maize or sorghum. A liter of milk = 700 Cal. This is equivalent to 200 gr of cereals in energy terms.

specific. It is mainly the women who are confronted with lack of food to feed the household, and they often cannot make the decisions concerning the sale of animals; the male head of the household does and even he often has to consult other members in the family hierarchy, or 'stock friends' who have a partial claim of ownership. And even if an animal can be sold, the man generally gets the money and there can be so many competing uses for this cash (from buying veterinary medicine, to buying beer) that it might easily 'evaporate'. In some households male heads simply regard it as their wives' responsibility to provide for food and they don't contribute. Food security at the micro-household level then depends on her ownership of animals (often some smallstock) and the possibilities she has to participate in the livestock and milk market. Generally women do have the opportunity to sell milk and do so independently. But then there should be a market for milk nearby. With increasing urbanisation, also in the drylands, these opportunities have increased considerably during the last twenty years. Nearby refugee camps, or large-scale projects (in Kenya the Bura Irrigation Project can be mentioned as an example during its heyday; or the Turkwell Gorge project in West Pokot) can offer the same opportunities.

- The availability of food aid provided by government agencies or NGOs complicates the situation further. Occasional food hand outs or food for work arrangements undercut the position of food and livestock traders and could result in the absence of any reliable trading infrastructure after food aid comes to an end. The collapse of trading infrastructure could well mean that 'lucrative caloric terms of trade' become an illusion and people become ever more dependent on food hand outs.

Not all commercialisation of livestock is a result of a gradual or dramatic process of diminishing livestock per capita, or of short-term disaster sales. Part of it can also be a deliberate strategy of rich pastoralists (and absentee herdowners -cum- politicians in particular) to become ranchers. They may focus on purely commercial production as an accumulation strategy. The emphasis then shifts to meat production, offtake maximalisation, and market-derived inputs (medicine, top-quality breeds, special feed), and fixed assets (water facilities, dips and sprays, fences). When livestock becomes a commodity as well, this could mean that pastoralists’ land tenure situation also changes. Behnke (1984, p. 265) states that a pastoral nomadic system of land use then changes to an 'open range ranching system', as a spontaneous process.

d. high level of commoditisation, supporting a market-intermediated intensification and diversification of the pastoral economy

With a further diminishing of livestock-per-capita ratios, growth of additional non-food consumption needs, or a change to a 'ranchers' mentality', pastoralists might be forced to intensify or diversify their economy. When adequate land and water or the access to it becomes a problem, investments in private water facilities and commercially available feed will be required (starting with payment for access to cultivators' stubble fields after harvests). In some cases individual herders succeed in acquiring pasture as property so that land becomes a commodity. Some herders then start to invest in fencing to keep others out, or at least to control access (sometimes demanding money for the use of pasture and water). So the ‘entitlements to natural resources’ are changing (Dietz, 1996).

According to Behnke (1984, 1985) this phase is often characterised by a shift from what he called the 'Open-range Ranching system' to a 'Fenced Ranching system'. This system has its roots in the USA where ranchers wanted to control their land, not their cattle (a beautiful epic account of this process can be found in Michener 1974). Land had become a commodity and had to be protected from occupation by others. At this stage, cattle had already been a commodity for a long time. After fencing, the ranchers were trapped in their ranches and had to adapt their practices and reduce grazing pressure. This shift was thus initiated through commoditisation of land. This practice was subsequently seen as a necessary step towards commercial production, and it was introduced in Africa since the fifties. Most Sahelian and semi-arid Eastern African countries have seen these projects fail. It would mean changing a labour-intensive subsistence production system to a labour-extensive commercial production system. There would be a shift from low per capita incomes to higher incomes for fewer people, and an expulsion of people from the production system due to lower labour demands. Migration would increase, while the pressure on those areas that did not made this shift yet would increase as well. Rutten (1992) states that land tenure change, and not improvement of productivity, is the only reason for this shift, because productivity of fenced ranching as practised in the USA is lower (in terms of protein production per hectare, see also Grandin 1987). Improved natural resource management is often mentioned as a reason for change as well, but degradation can be found in both systems.

Productivity per animal can also be improved by improved veterinary care, improved breeds, better feed and improved access to water. The cash involved is acquired through informal or even formal forms of credit and this could mean (it not necessarily does) that interest payments become an additional driving force to increased levels of commoditisation.

A higher level of commoditisation in land, production and consumption is often accompanied by a higher level of commoditisation of labour. Pastoralists try to get (additional) cash by working elsewhere or to get access to local wage-paying jobs, related to the government, NGOs or private traders. But if pastoral commoditisation results in increased stratification within the pastoral society, pastoralists who accumulate animals beyond levels which they can manage with their family labour, start to employ fellow pastoralists as labourers, a process that is often hidden behind various types of patron-client arrangements of labour and a large element of non-cash payment of labour. On the other hand pastoralists whose herds and flocks have diminished to levels that force them to get most of their income from other sources try to get jobs as paid herders. Rebuilding their own herd/flock becomes a possibility, especially if payment is partly in the form of animals and if the pastoral employer allows their dependent herders to share the management of their small number of their animals with the employers' herd and flock. In a number of cases the pastoral sector is invaded by absentee herd owners who invest in animals, but who put the management of their herds in the hands of paid managers and labourers.

The concept of 'Caloric Terms of Trade' is another crucial one to understand what is going on in pastoral societies. Basically it means: how much more food value (in calories) do you get back in grains (maize, or sorghum) if you sell livestock or milk.

1.3 Caloric Terms of Trade: a summary of evidence from the literature

In Zaal 1998, an analysis has been presented of the terms of trade debate as far as pastoral production is concerned. Zaal recalculated the empirical data that was presented by a number of authors to be able to present those data as 'caloric terms of trade' data. In table 1 the evidence has been summarised.

Table 1:

Caloric Terms of Trade (Tc): evidence from the literature.

Author	Area	Type of exchange	High to normal Tc	Low Tc
Sen, 1981	Ethiopia, Ogaden	cattle for maize	'normal': 3	1974: 1
Sutter, 1982	Niger, Tanout (FulBe)	oxen, male sheep and goats for millet	1977: 19; 1978: 7	1973-74 drought: 4-5
Little, 1983	Kenya, Il Chamus Baringo	cattle for maize	1950s: 5; 1970s and 80s: 3-4	1981: 3
Swift, 1986	Mali and Niger	cattle for millet	'mostly': 4-10; 1958: 16	1963: 2 (other drought years: 2.3-2.6)
same	same	milk for millet	'mostly': 10-20	1963: 2.5
Mbogoh & Akello-Ogutu, 1991	Kenya, Machakos	cattle for maize	1962-1988: 7-11	1957: 5
same	same	milk for maize	1962-1988: high 16	low: 6
Karim, 1991	Sudan, Red Sea Hills	cattle for sorghum	1989: 14-18; April-Dec. 1990: 6-7; April 1991: 6	December 1990: 1.3
Gillard-Byers, 1993	Sudan: Baggara, Southern Kordofan	cattle for sorghum	17 (1986 after recovery)	1.5-2 during the 1984/85 drought
Khan, 1994	Niger	cattle for millet	1978-80, 1982-84: 6-12; 1986-89: 10-20	1981 and 1985: 2-4
Ensminger, 1996	Kenya, Orma	cattle for maize	mostly 3-4	1926: 1.6
Zaal, 1998	Burkina Faso, Gorom Gorom	male cattle for millet	1994-1995: 9-17	early 1990s: 4-9
same	same	male sheep for millet	1994-1995: 11-27	early 1990s: 5-10

Mainly based on: Zaal 1998.

The evidence shows that even during the worst periods (with the exceptionally bad situation in the Ogaden in 1974 as the worst recorded situation, as presented in the famous study by Sen 1981) the Tc is still at or above parity, at least for those animals that could be sold. In some cases the Tc even reached levels beyond 10. If all income from the sale of livestock or milk would be spent to buy grains, it would mean that households could feed themselves properly if the TLU/capita situation would not even be 0.3 (or in 'standard household terms': less than 3 cattle per household production unit). For a food secure pastoral area it would in those cases mean that the TLU/ha could be much lower than if herders would have to feed themselves from their own herds only. Authors who try to find reasons for the high, and probably improving Tc in many African pastoral areas during the 20th Century point at the steadily improving markets for animals, due to urbanisation and an increasing demand from urban prosperous consumers (e.g. De Haan, Quarles van Ufford & Zaal 1997; Quarles van Ufford 1999). We may add (following Swift 1986) that there probably was a considerable difference in the change of labour productivity of livestock production versus grain production during the second half of the 20th Century. Not only the labour productivity of grain production increased due to more productive crops, better varieties, better inputs and better management and care (and despite the dramatically decreased average rainfall in some areas during the 1970s and 1980s; see Put 1999), but also the average labour needs in pastoral production probably increased: with restricted access, increased cultivation around water points and along rivers, and increased insecurity, the labour demands of herding must have intensified. In addition, probably the infrastructure for grain trade improved more than for livestock trade, resulting in a diminishing proportion of transaction costs in the consumer price for grains, and a lower gain for livestock (less motorised transport, higher risks, less economies of scale, less competition from government-led attempts to keep the grain price low, while leaving the livestock and milk price more to the 'free market').

2 WEST POKOT, KAJIADO, GARISSA, MARSABIT: KENYAN EXAMPLES

The PhD study by Dietz (1987) among the Pokot ended with a first assessment of the Tc situation and concluded that the Tc not only was generally high, but also improving during the 20th Century. This argument was further developed in Dietz 1993 and in Zaal & Dietz 1999, adding evidence among the Maasai. Zaal further presented his findings about the Maasai of Kajiado District in his PhD thesis, defended and published in 1998. Nunow developed his approach for the situation among the Kenyan Somali in Garissa District in a PhD thesis which he will hopefully defend in 2000. Adano Wario Roba collected data about Marsabit District for a PhD study which will be defended later. Here we will give a summary of the findings and compare the results..

2.1 Livestock Numbers per Capita

The history of livestock numbers in the four districts shows a dramatically different picture. In Kajiado the most recent period for which we used data also shows the highest numbers. In Garissa and Marsabit the most recent period shows the lowest numbers ever recorded, while West Pokot reached its climax in the early 1950s and again in the early 1970s, and recovered a bit from the desperate situation after the 1979-84 disasters which were a combination of drought, diseases, cattle theft and punitive 'actions' by the Kenyan army (see table 2). If we look at the translation of these data into 'tropical livestock numbers per square kilometre' the lowest situation recorded for Marsabit is around 4 TLU/km² (early 1970s and mid 1990s) and in the other districts around 10 TLU/km²: 1983 in West Pokot, 1962 in Kajiado and 1998 in

Garissa. In itself this is strange, because - on average - the range-ecological situation in West Pokot and Kajiado is better than the one in Garissa (which is mostly an arid zone, while Kajiado and West Pokot are mostly semi-arid and sub-humid to semi-arid respectively). In bad years there seems to be a comparable lower limit to what the combination of ecology and management practices can endure in those three districts. In the ‘best years’ (with the highest number of animals) the situation is different: Kajiado leads with 54 TLU/km² in 1992, followed by West Pokot with 28 TLU/km² in 1972 and Garissa with the remarkably high number of 23 TLU/km² in 1979. In Marsabit the highest TLU/km² was never more than 8. In all districts, but in Kajiado in particular, one should also add considerable numbers of wild game, competing for the same resources.

Table 2
Livestock numbers in West Pokot, Kajiado, Marsabit and Garissa

District	Highest recorded number of livestock	Lowest recorded number of livestock	Recent number of livestock
West Pokot	cattle: 300,000 (both in 1952 and in 1972); goats and sheep: 1999: 595,000	cattle: less than 100,000 (1983); shoats: 200,000 (1983)	276,000 cattle; 595,000 shoats, 2,000 camels (255,000 TLU) (1999)
Kajiado	1992: cattle: 890,000; 890,000 sheep; 900,000 goats	cattle: 170,000 (1962) (in 1912: 200,000)	810,000 TLU (1992)
Marsabit	cattle: 430,000 in 1979; goats: 500,000 in 1982; sheep 500,000 in 1978; camels 220,000 in 1989 (TLU: 520,000 in 1989)	cattle 140,000 mid 1990s; goats 200,000 1972; sheep 150,000 late 1960s; camels 100,000 mid 1990s (TLU less than 300,000 in mid 1990s)	300,000 TLU mid 1990s
Garissa	around 1990: 700,000 cattle, 700,000 shoats and 70,000 camels	cattle: 250,000 (1998)	1998: 320,000 TLU

Table 3
Population estimates in West Pokot, Kajiado, Marsabit and Garissa

District	Early population record	Recent population record
West Pokot	1926: “between 24,000 and 45,000”	1989-census: 250,000 of which approx. 180,000 Pokot; in 1993 many non-Pokot fled (estimate 1999: 300,000)
Kajiado	1912: 10,000	est. 1999: 215,000 Maasai and 230,000 non-Maasai
Marsabit	1969: 50,000	mid 1990s est. 140,000 (Boran, Gabbra and Rendille

		together 75%)
Garissa	1969: 65,000	1999: est.: 200,000 'local' and 160,000 in refugee camps; mostly Somali

Population data are notoriously unreliable, even if we use recent censuses. Figures should be seen as rather rough estimates only. Indications of ethnic identity are even less reliable, as there are quite a number of cases of mixed or shifting identity (e.g. Kikuyu-Maasai in Kajiado or Samburu-Rendille or Gabbra-Boran in Marsabit) and smaller groups (e.g. the Sengwer in West Pokot or Waata in Marsabit) are often overlooked. However: in general we may conclude that during the 20th Century the population has increased tremendously, both by natural population growth (due to better health, and higher security) and by immigration of either ethnic 'outsiders' (as in West Pokot, until many of them were chased out during 'ethnic cleansing' in the mid 1990s; and in Kajiado where non-Maasai begin to become the dominant group now) or refugees (as in Garissa; mostly from Somalia). See table 3. If we compare the various estimates of numbers of people and animals during this century we can tentatively calculate the development of the TLU/capita figures for the three districts. We have to take into account that a level of 3 or, to be on the safe side, 4 TLU/capita is required for food self sufficiency when all food has to come directly from the animals themselves.

We can assume that for all pastoral groups in Kenya food sufficiency based on livestock alone had been seriously threatened by disasters between 1880 and 1900 (rinderpest, drought, warfare) and that they all regained their strength, under Pax Brittannica, in the 1920s.
For West Pokot we see that the Pokot were above the food self-sufficiency threshold until the 1950s and hence could more or less easily rely on their animals in isolation from the rest of the world. As most other pastoral groups, the Pokot had improved their livestock existence between 1900 and 1930 and, assisted by the British colonial agencies, they could expand towards the Turkana area in the 1910s and towards the Karimojong area in the 1920s, although they had to give up their claims of the Trans Nzoia highlands during the same period. After 1930 the TLU/capita situation gradually deteriorated and in the course of the 1950s the Pokot began to rely more on the market and on cultivation. But the pastoral Pokot had strong bonds with the so-called agricultural Pokot who had developed ingenious irrigation practices on the northern edge of the Cherangani mountains, so for quite some time they could rely on their internal food security system. From the mid 1970s onwards the situation became more dangerous, with TLU/capita levels below 2, further deteriorating to levels below 1 after the early 1980s. There was some recovery later, but never better than Tc =1. We may conclude that the Pokot had become 'pastoralists in dire straits', very much depending on the outside world (and on increased cultivation) for their food security. One may expect that they began to rely on the livestock-for-grains market a lot, depending on Tc levels.

After recovering from the rinderpest and other disasters at the turn of the Century, in Kajiado the TLU/capita situation had become extremely good until the 1950s, with levels beyond 10 and even reaching 17 TLU/capita. The Maasai could easily maintain an overall level of complete food self sufficiency based on their own milk and meat production, and this was probably true for all household production units as well. The Maasai area in Kajiado and in the neighbouring Narok district as well could easily accommodate the Maasai who had been 'replaced' from the former huge Maasai area in the north to make place for White settlers in those Uasin Gishu, Nakuru and Laikipia areas during the first thirty years of the 20th Century. The early 1960s were a dramatic break with that prosperity. It suddenly reached a 'danger level' of 3 TLU/capita. But unlike the Pokot, the Maasai were able to recover to a level of about 5 TLU/capita in the early 1980s. The drought of 1984 resulted in another downfall (to an average level of 2.5 TLU/capita) meaning food security stress for many Maasai households. Livestock-for-grains trade became a necessary strategy, and for the first time many Maasai households started to experiment with cultivation and some even with irrigation and water harvesting methods. However, in the early 1990s the Maasai recovered again and it seems that - on average- they reached a rather comfortable level of 5 TLU/capita. Probably there was some deterioration afterwards, due to the very high population increase and worsening weather conditions. Compared to all other pastoral communities studied in this research, the average Maasai of Kajiado is very well off. However, Maasai society is a rather unequal society nowadays, with large differences in livestock wealth between households. Zaal (1998) gives detailed evidence for the Olkarkar area: 42 percent of all Maasai households in Olkarkar had less than 4 TLU/capita;13 percent even below 2 TLU/capita. On the other end of the wealth spectrum more than 20 percent of all households had TLU/capita levels of 10 or more.

In Marsabit the TLU/capita situation has always been higher than the threshold of 4 until 1990. Following the disastrous drought of 1987, especially the Boran, but also Gabbra and Rendille groups all moved towards a danger level of 2 TLU/capita or even lower. Cultivation (in wetlands within the drylands, and especially on Marsabit Mountain) became a way out, but commercialisation as well, next to food aid.

In Garissa the TLU/capita situation was still rather good in 1980 (a level of about 5 TLU/cap.), but it deteriorated dramatically afterwards, to a level below 2 in 1995 and close to 1 in the late 1990s. Riverine cultivation along the Tana river became one way out. Relying on the huge food aid operation for Somali refugees after 1991(the Dadaab camps in particular) became another strategy. We may also expect that livestock-for-grains trade would become more important and would increasingly be used for food security purposes.

2.2 Livestock commercial offtake rates

In Kenya as a whole the 'national' cattle herd increased from a level of about 7 to 8 million animals during the 1960s to a level of 13 to 14 million animals during the 1990s (Zaal, 1998; FAO database www). The number of sheep went up from 5 million in 1960 to 6 million in the late 1990s. For goats the situation gradually deteriorated from about 10 million animals in 1960 to 8 million in the mid 1970s, and closer to 7 million during the 1990s. In total the number of tropical livestock units went up from 7 to 11 million. However, in relative terms it deteriorated from a level of close to 1 TLU/capita to only between 0.3 and 0.4. The desire for meat can be expected to have increased considerably per capita. Despite the economic crisis since the mid-1980s the average economic situation for Kenyans is still considerably better than in the early 1960s. Four results can be expected: a higher national demand for Kenyan meat and milk and hence higher offtake rates; lower exports; higher imports; and a tendency of price increases due to the decreasing availability of animals per capita. Indeed the value of Kenyan livestock exports diminished from a level of 1.5 million US$ in the 1960s to a meagre 300,000 US$ per annum nowadays (FAO database, 1999, www). In addition, the necessity for many livestock producers to sell livestock to be able to buy grains (and other consumption goods) adds a second reason why we may expect a considerably increased commercial offtake rate.

A high level of food independence does not necessarily mean a low level of commercial offtake. In West Pokot the colonial administration had successfully tried to force the Pokot to sell part of their cattle during a period when their TLU/capita situation was still adequate for market independence. During the Second World War and between 1954 and 1960 compulsory quota for cattle sales existed. 'Official', registered trade in cattle went up from a level of 1,000-2,000 to 8,000-10,000 per year in West Pokot, or from an estimated registered annual offtake of close to 1 per cent only to between 6 and 9 per cent in this area. Officially registered sale of smallstock was between 7,000 and 14,000 in drought years and 4,000 and 6,000 in other years. In the Uganda-administered Pokot area (Karapokot and Upe) officially registered cattle sales fluctuated between 1,300 to 2,500 in years of good rainfall and between 3,000 and 4,000 in years with droughts, which was still below an estimated offtake rate of 4 per cent per annum in that area. Figures for the sale of smallstock are unknown. With the breakdown of colonial rule (and effective taxation) and the drought of 1961 the 'official registration' of trade collapsed, both in the Kenyan and in the Ugandan areas of Pokot (see Dietz 1987). Trade in cattle and goats went largely unrecorded in post-colonial years, with the exception of drought years when the need for distress sales forced herders to come to the official markets (e.g. 1973: 9,000 cattle, 6,000 smallstock). If we look at the total commoditisation picture for the pastoral Pokot during the mid 1970s, it becomes evident that some commercial sale of livestock existed for most pastoral households. However, ceremonial slaughter of cattle was probably more important than sale of cattle, and slaughter of goats and sheep for home consumption more important than sale of smallstock. Milk was not sold at all, with the exception of some barter exchange on weekly market days. The need to buy other consumer goods was very minimal as 'western' or 'decent' clothes were not yet forced upon the pastoral Pokot by government action or missionary drive. Education was still a minimal affair and the few pastoral children who went to school did so under missionary arrangements of a total subsidy. Livestock inputs were only beginning to be acquired through the veterinary services.

A combination of disasters like the one hitting the Pokot community between 1979 and 1984 was needed to drastically change the situation. When forced by severely reduced livestock wealth, Pokot tried to make good use of the positive caloric terms of trade between livestock (products) and grains. First Somali traders were important intermediaries, later Pokot livestock and grain traders appeared on the scene as well. However, money was ever more needed for other goods and services as well. During the 1980s the government forced most of the pastoral Pokot to wear 'decent' clothes. Many pastoral Pokot children had joined primary and even secondary education (partly because of the school food and missionary food assistance through schools). However, grazing land nor pastoral labour were commodities (yet) and 'subdivision of group ranches' was no issue, partly because group ranches had never properly functioned and individual claims to land only began to be relevant in some of the 'new' cultivation areas, e.g. along the Suam river. The age-old relevance of the goats-for-sorghum trade between pastoral and agricultural Pokot was soon to become negligible, because the pastoralists started to prefer maize grains. The supply of maize grains from the Pokot highlands (but often not produced by Pokot farmers but by immigrants) increased considerably during the 1970s. Maize-for-goats trade was less dominated by 'traditional obligations' than sorghum-for-goats trade (where even during drought years traders exchanged according to custom; e.g. "a goat for a bag"). Maize traders entered the scene who did not belong the long-standing Pokot-Somali networks and many new shops appeared in the pastoral areas either run by non-Pokot (Kikuyus for example) or by Pokot from the highlands. Trade in goats changed as well, as young Pokot traders took over from Somalis who mainly concentrated on the important gold trade after 1979. All this meant that prices started fluctuating to become more congruent with supply and demand situations. During the 1980s, lowland markets expanded rapidly (in 1999 there were 17 of them). Most of them functioned once a week (like the larger markets of Chepareria and Chepkopegh), or twice a week (those near the district headquarters, like Cheptuya and Serewo). In addition there were irregular smaller markets. Many markets also provided chicken and eggs, hides and skins, grains, fruits, and some clothing and utensils as well. In most of the markets shops were started, and increasingly pastoralists could buy maize meal there, more expensive compared to maize grains, but with less problems of transport and milling.

According to official records of the Livestock Production Office in West Pokot District, annual data 1985-1998) cattle and smallstock sales fluctuated enormously. In the peak years 1990-1992 cattle sales reached figures beyond 20,000 head per year or more than 10% commercial, officially registered offtake, while during the same top period officially recorded sale of ‘shoats’ reached 60,000 or 14% offtake. This was higher than ever. However, in bad years (like 1986) only 2,000 head of cattle were sold on official markets (only 1.3% offtake) and 4,000 shoats (1.4% offtake). And during and after the ‘ethnic cleansing’ in 1993, registered, official sales dropped to levels between 0.5 and 2.5% annual offtake for cattle and between 0.8 and 4.9% annual offtake for smallstock. Partly this can be explained by the reduced lack of confidence of Pokot sellers in government-controlled markets, partly by the collapse of the trade network, as far as non-Pokot participated, and partly by a collapse of the government ability to register what happened.

In the Maasai area, conditions for livestock marketing are much more favourable than in many other dry regions of Kenya. Kajiado District in particular has a good connection with Nairobi through the tarmac road to Tanzania that runs through it, while the northern part of the District borders the railway line, the main road to Mombasa and the densely populated Machakos District.

Animals are either sold or given to brokers who collect the animals at the producers' homes until they have a herd that is large enough for marketing, or the animal is taken to a nearby market by the producer himself. Small markets serve as collection points, from which the bigger markets are supplied. In Kajiado District, Emali market has always been one of the most important markets (Bekure et al, 1991). Even recently this is the case though other markets now have a considerable share. A study of Emali cattle market in Kajiado District in 1990/1 revealed that supply varied considerably from 1500 heads per week in late 1990 to a peak of 5000 in mid 1991. Numbers sold were between 30 - 90% of numbers offered and prices were high (Zaal 1993). There are a number of explanations for these high average prices. Private slaughterhouses serve as new end-points of the marketing chain, with Nairobi butchers contracting traders to buy and slaughter animals for them in Ngong area, but now increasingly also in Kajiado slaughterhouses further away. After slaughtering, the carcasses are transported to Nairobi by car, so-called 'meat matatus', high-speed unchilled pickup trucks with special boxes in the back that take about an hour to reach Nairobi. Secondly, animals are usually taken from Tanzania to Kajiado, but this changed in 1993, when the value of the Kenya shilling was so low that for the first time since the early sixties, animals were taken from Kenya to Tanzania instead. This helped keeping prices up, though probably marginally. Thirdly, the politically inspired conflicts between various ethnic groups in Rift Valley Province disrupted flows of animals to Nairobi. Finally, the conflict in Somalia resulted in a hesitance of traders to go and buy animals in neighbouring Districts (for an account of what happened with livestock trade in Somalia itself, see Little 1996). In Kajiado the average registered commercial sale of cattle was 56,000 animals per annum, during the 1991-1995 period or 7% commercial offtake rate, which is high compared to West Pokot, but lower than one might expect given the excellent marketing conditions. With 350,000 smallstock sold per annum during the same period the commercial offtake rate of ‘shoats’ had reached a level of 21%. In Marsabit the historical evidence cannot yet be given, but the research in 1997-1998 at Marsabit market shows an annual level of sales at about 10,000 head of cattle per annum, 30,000 goats, and 20,000 sheep. In terms of recorded offtake rates this means 7% for cattle, 8% for goats and 7% for sheep. Most commercial offtake of smallstock takes place outside the Marsabit market, in smaller lowland centres, like Maikona and Korr. Most of the livestock that is sold at Marsabit market leaves the district by truck towards Nairobi.

The 1990s show an increasing liberalisation of the marketing situation in Kenya, and of livestock marketing in particular. However, before this, both the Colonial government and the Kenyan government after independence in 1963, attempted to control the livestock markets. The Kenyan Meat Commission and the Livestock Marketing Division were the major buyers of livestock from all over the country. Many traders districts supplied livestock, mainly cattle, to the KMC depots in Mombasa and Nairobi. However, even during the times of strict government control, there was a rather large volume of animals that was sold to the private abattoirs in the big consumer markets of Nairobi and Mombasa.

Looking at the livestock sales data from Garissa it is evident that the livestock sale to places outside Garissa district has been relatively high for most of the post-Independence times because of the strategic location of Garissa as the entry point to northeastern Kenya with modern road linkage with the rest of the country. Because the information is new (and with more details in the forthcoming PhD thesis of Nunow) some more extensive information will be given here. The sales volume for cattle outside Garissa district has been fluctuating over the years. The lowest figure of cattle sold outside Garissa district during the period was recorded in 1983, after the long drought of 1979-82, with only about 7,000 heads sold or about 1% commercial offtake. The drought not only influenced the quantity and quality of the animals sold, but resulted in increased migrations by the nomads to wherever they could find pasture for their animals, often far from regular market outlets. Since that drought however, the figure for cattle sales outside Garissa continued to increase and it ranged between 16,000 heads in 1987 (or probably 3% commercial offtake) and a staggering 102,000 heads in 1998 (District Livestock Production Office (DLPO), Garissa). However, this figure includes many animals coming from Somalia and from the rest of Northeastern Kenya during the severe drought and disaster situation of 1996-98. Compared to the 1979-82 drought there were higher sales of cattle during the drought period of 1991-1992 to a level of 40,000 animals, or close to 10% commercial offtake rate (although already including animals coming from Somalia). The sales figure continued to rise between 1994 and 1998 except for a moderate decline in 1997. In general, more pastoralist households participated in the market during droughts since the subsistence on livestock products had become inadequate for many households, hence the need to sell animals, in exchange for money to buy food (maize meal in particular) and other necessities. The increased number of cattle sales may only partly be explained by simply increased sales by the local pastoralists. In addition, most of the other livestock markets in the larger Somali area are or have become less active than the one in Garissa and this leads to many pastoralists from the other districts and from Somalia Republic selling their animals in Garissa market. A commercial offtake rate based on a comparison between locally available animals and actual commercial sales can no longer be calculated in this situation. However, it may be concluded that the local commercial offtake rate has indeed become very high during the 1990s.

Since there is little pasture for the livestock during periods of drought and dry seasons, the traders who would ordinarily graze their livestock locally in order to sell in the future cannot do so. This then compels these traders to sell to larger traders who then sell to outside the district. Sales of livestock outside Garissa district, especially cattle and smallstock, often depends on traders who may be local Somali or others from the rest of the country. Increased sales by these traders is usually experienced during festivities such as Christmas for the Christians and Idd[4] for the Muslims. Usually, more livestock is sold in upland Kenya from Garissa district during the Christmas period since the Christian population is higher in the other provinces of the country than it is in northeastern province of Kenya. On the other hand, the Muslim population is highest in northeastern Kenya and at the Kenyan coast and more animals are consumed during the Muslim festivals in these areas.

The considerable annual fluctuations cannot be explained only by local climatic conditions such as drought, and most of it may be accounted for by the role of traders and the local security situation at any given time. Whenever there is an incident of robbery or banditry activities along the roads connecting Garissa to Nairobi or Mombasa, there is a decline in the number of cattle leaving Garissa for a certain period of time until the security condition improves. Although there is lack of conclusive data on the trend of insecurity over the years, more incidents of insecurity are often reported during the dry seasons and at the beginning of the rainy seasons. Since there is increased movement of the pastoralists during the dry season and just after the onset of the rains, the bandits who steal the animals are able to disguise themselves among the pastoralists and hence easily get away. In our opinion, the security situation plays an important role in the volume of cattle sales outside Garissa district since livestock is sometimes trekked for many days and can easily be stolen on the way. Still, the level of off-take is considerable.

The average nominal prices for cattle[5] have been fluctuating over the years, although less so than the volumes of sale outside the district. The period after 1992 has recorded a continued rise in average nominal prices until 1996, when there was some decline. The average prices then rose in 1998. The year 1993 was the second year of a severe drought that had claimed many livestock. As a result of the drought of that year and the year before, we would expect a reduction in volume of sales, hence higher prices. However, both the prices as well as the volumes were high in 1993. The increase in both volumes of cattle sales outside the district and average prices may be explained by a combination of several factors including: the civil war in the Republic of Somalia, the quality of animals in the market, inflation in the national economy and insecurity in the area. Following the collapse of the government in Somalia in 1991, there was continued rivalry between various warlords and the civil war has gone on unabated since then. The consequence of the war on livestock marketing was such that many

[4] There are two Idd festivals celebrated annually. One is related to the Muslim Holy month of Ramadhan and it is marked on the day following the last day of the month of fasting. This is called Idd-ul-Fitr. The second is related to the Muslim annual pilgrimage to Mecca and it is marked on the day of pilgrimage. The Idd for the pilgrimage is known as Idd-ul-Adha, and it is during this Idd that slaughter of an animal is most desired.

[5] Average nominal prices are computed by the DLPO in Garissa by taking only the highest and the lowest figures for the period, and dividing it by two. This process may not show the variations between the two extremes and whether the prices are skewed towards the upper limit or the lower one.

animals were redirected to the Kenyan market in Garissa town. The flow of animals from Somalia to the Garissa market is dominated by, but not limited to, cattle. Since it is usually the high quality animals that are able to withstand the vigour of the long trek from Somalia (mainly Kismayu area) to Garissa market, the animals are of high quality and hence command high prices. The effect of insecurity in the area is such that traders are discouraged by frequent incidents of insecurity while a relative improvement in the security situation has the effect of enabling more traders to trade in livestock. The prices tend to increase whenever there are several new traders coming to the area while the lack of this may lead to lower prices. In addition, inflation in the national economy tends to lead to higher prices. We very tentatively present an assessment of 'real price' development for the period 1983-1998. After the 1979-82 drought the 'real' prices were first rather high, but falling during the 1984 drought, climbing up to very high levels in the recovery years 1986-87 and gradually becoming more 'normal' again in the late 1980s, increasing to unprecedented levels after the 1991-93 drought and falling afterwards to rather low price levels during the 1996-97 drought, with a slight recovery afterwards. Current 'real' cattle prices are still below the price level of 1983.

Table 4
'Real' cattle prices in the Garissa market, 1983-1998

Year	Nominal average price per head of cattle, Garissa market, KShs	Inflation (% per year)	Price index (1998 = 100)	'Real' average price per head of cattle, KShs, rounded
1983	950	14	786	7900
1984	900	9	689	6200
1985	1400	11	633	8900
1986	1800	6	570	10300
1987	2200	8	538	11800
1988	1900	12	498	9500
1989	2000	13	444	8900
1990	2500	15	393	9800
1991	3000	20	342	10300
1992	2300	26	285	6500
1993	5800	45	226	13100
1994	6000	29	156	9400
1995	6000	2	121	7300
1996	5200	8	119	6200
1997	5300	10	110	5800
1998	6700	..	100	6700

Source: the average cattle prices are from annual reports of the District Livestock Production Office, Garissa; the inflation data are taken from various issues of the Economic Surveys, published by the Government of Kenya; annual average increases are computed by weighted averages for the lower, middle and higher income groups. Interpretations and calculations by Abdirizak Arale Nunow and Ton Dietz.

The trend in smallstock sales in Garissa district is similar to the one observed for cattle. In general, the volume of sales has been higher in the period after 1993 than the period before, with the exception of 1989 when relatively high sales volumes were recorded for smallstock in the area.

The volume of smallstock exported from Garissa district showed a moderate fluctuation over the period 1983 - 1987. There was a gradual increase thereafter, reaching a peak in 1989. After 1989, there was a decline in the volume of smallstock leaving Garissa district, attaining a record low in 1993. After 1993, the number of smallstock sales increased substantially to almost 80,000 heads in 1996. There was a sharp fall in the number of smallstock sales in 1997, but this increased again in 1998. The factors affecting the smallstock exports from Garissa district are the same as those affecting the cattle exports, although the demand for festivities such as Christmas and Idd has more impact on smallstock sales than on cattle, because more smallstock are slaughtered during these festivities. The other factors affecting the demand for smallstock, as they do for cattle, include the climatic conditions, traders, security, economic conditions (e.g. inflation) and the existence of restrictions on livestock movements in the area. Quarantines and restrictions of livestock mobility have declined since the early 1990s and the other issues play a more important role since then.

2.3 Caloric Terms of Trade

In West Pokot the most important trade link during periods of droughts until the 1970s was the link between sorghum from the Pokot indigenous irrigation areas and goats from the lowlands. There used to be a fixed exchange rate of ‘one bag for a goat’, which means a Tc of 13. However, the relevance of this type of exchange has almost disappeared because most Pokot prefer maize now. For maize grains against goats the Tc has been fluctuating a lot: from a level of 9 during the early 1970s, to a dramatically low level of 2 in 1981 (after the 1979-81 drought and disaster years), to a level beyond 15 in the late 1980s, down to 6 in the turbulent year 1993 - with very high maize prices -, up to 23 in 1996 and back to 9 in mid 1999, which is still high for Kenyan standards. As more and more Pokot no longer buy maize grains from the nearby highlands, but start buying industrially produced maize meal, at higher prices, the Tc for maize meal against goats is a bit lower. Also, the Tc for cattle against maize grains has almost always been slightly lower than the Tc for goats against maize grains.

In Kajiado the fluctuations in the level of Tc are more moderate: from low levels of 3 to 4 in the mid 1970s (after the 1974 drought) and 6 in the late 1980s there are peaks of 9 around 1980 and 7 to 8 in the early 1970s and 1990s. Here the exchange is between cattle and maize meal.

In Marsabit the Tc situation during the disaster years 1984-1987 was close to parity: between 1 and 2 (according to unpublished data from the UNESCO-IPAL project in the area). Data from the recent field study indicates that Tc levels during the 1996/97 drought were between 4.4 and 4.8 for the exchange of cattle against maize grains from the mountain and between 3.8 and 4.0 for the exchange of cattle against maize meal in lowland market sites like Maikona. In 1997-98 the Tc level improved to levels around 6 for maize grains and around 5 for maize meal. For camels the situation is not much different compared to cattle in Tc terms. For goats the Tc fluctuations seem to be more variable than for cattle and camels: during the drought the Tc was lower but in 1998 it was higher than for cattle. The demand for sheep is lower than for goats and hence the Tc has always been lower as well. At the worst period of the recent drought in Marsabit pastoralists were confronted with the situation that no buyers were willing to buy and some pastoralists had to sell the skinny animals for the price of their hide only, even less than transport costs to bring these animals to the Marsabit market, so pastoralists were very much at a loss. However, those who had some money could always buy grains or meal from the market, also in smaller centres which have proliferated as elsewhere in Kenya.

In Garissa we will look at what happened during the drought of 1996-97 in three market places, based on detailed research by Nunow. Garissa is the major commercial centre, Dadaab is near the huge refugee camp and Ijara is in an isolated area towards the south, not far from the border with Somalia.

Like in Kajiado, maize meal is usually preferred to maize grains and Nunow found every household in his survey to have purchased maize meal quite regularly, as opposed to maize grains. Whenever the maize grains are purchased, they are crushed into maize meal before it is consumed. The maize meal is cooked and made into a hard paste and it is usually eaten with milk or a stew of some vegetables and a bit of meat. The caloric terms of trade were found to vary from one area to another and over the seasons. However, seasonal fluctuations were moderate because of the continuous drought. In all cases, Garissa town had the best terms of trade in calories when compared with the other two locations of Dadaab and Ijara. The ratio (Tc) of beef to maize meal was between 5 and 7 for Garissa; 2.6 and 5.5 for Dadaab; 1.8 and 3.3 for Ijara. Prices of cattle were similar in Garissa and Dadaab and lowest in Ijara. However, the price of maize meal was highest in Ijara, intermediate in Dadaab and lowest in Garissa, hence the variation in the relative ratios.

Although it is not commonly utilized by the Somali pastoralists, maize grains offer better caloric terms of trade compared to maize meal because it is often cheaper. However, there is usually an additional cost of grinding the maize grains into maize meal before it is consumed. In the following table, we present the caloric terms of trade between cattle and maize grains, and smallstock and maize grains.

Table 5
Caloric terms of trade by location and type of livestock* (1996/1997)

Month	Beef/maize grain			Smallstock meat/maize grain		
	Garissa	Dadaab	Ijara	Garissa	Dadaab	Ijara
Mar ‘96	8.3	5.9	2.2	19.4	6.4	4.0
Jun	9.1	6.2	2.7	13.1	7.8	3.1
Sep	6.9	3.5	2.6	10.1	4.7	3.5
Dec	8.3	5.0	2.5	14.1	6,1	2.8
Mar ‘97	8.2	3.3	3.8	8.1	4.9	2.6
Jun	7.8	3.2	2.5	7.4	3.9	2.3
Sep	6.4	3.3	2.6	8.6	4.2	2.0
Dec	7.4	5.0	2.3	8.5	6.3	2.0
Average	7.8	4.4	2.7	11.2	5.3	2.8

Source: Own survey Abdirizak Arale Nunow, 1996-97; the price for meat is computed from the sale of live animals in the market.

Garissa town was again found to be a better market for pastoralists than the more distant market places of Dadaab and Ijara. The ratio of beef to maize grains in the three areas was found to be between 6.4 and 9.1 for Garissa, 3.2 and 6.2 for Dadaab and 2.2 and 3.8 for Ijara. The averages for the three areas were 7.8, 4.4, and 2.7 for Garissa, Dadaab and Ijara respectively. While their cattle fetched low prices in the local market, the Ijara pastoralists had to pay higher costs for maize grains due to the difficulties associated with delivery of food to the area and the risks involved due to the insecurity. On the other hand, the availability of both refugee food and relief food in the market had improved the terms of trade (Tc) for the Dadaab pastoralists. During this time, there was little relief food in Ijara compared to the other parts of the district.

When we consider the caloric terms of trade for smallstock to maize grains, the ratio was highest in Garissa, intermediate in Dadaab and again lowest in Ijara. The geographical differences were huge, especially between the main urban town of Garissa and the outer markets of Dadaab and Ijara. The average ratios were 11.2, 5.3 and 2.8 for Garissa, Dadaab and Ijara respectively. Apparently, the Somali pastoralists preferred smallstock to cattle for slaughter, and as a consequence, there was a higher price demanded per kilogram of animal. Since the most commonly consumed foodstuff in the area was maize meal, and the commonest source of meat is smallstock (beef is rarely sold in the smaller trading centres), we look at the terms of trade between smallstock and maize meal as well.

Garissa town had a considerably higher Tc between smallstock and maize meal than Dadaab and Ijara, especially in 1996. This was the result of a combination of cheap maize meal compared to the other areas, and high relative prices for smallstock. The Tc values ranged from 6.2 and 14.9 for Garissa town, 3.2 and 7.0 for Dadaab, and 1.5 and 3.4 for Ijara. The ratios deteriorated in all the locations over the study period, and approached unity in the case of Ijara. This may be attributed to the low livestock prices over the period, making the per kilo price of meat quite low. The figures for Dadaab and Ijara were close with Dadaab enjoying more favourable Tc ratios than Ijara. The average figures for the Tc in the three survey areas were 8.9, 4.5 and 2.3 for Garissa town, Dadaab and Ijara respectively.

The foregoing shows that selling livestock and purchasing maize meal (other factors remaining the same), would make the Somali pastoralists in the study area better off in caloric terms. It should be added that certain basic conditions need to be in place if the positive Tc is to benefit the Somali pastoralists. The most important among these factors include: 1) the availability of saleable animals in the herd; 2) the availability of buyers for the animals and; 3) the availability and accessibility of the maize meal. Talking of saleable stock in the herd, a pastoralist may have some animals and yet have no saleable animals given the need to keep a certain minimum number, species and structure of animals for reproduction. Although the majority of the households in Garissa district are still pastoralists and therefore do have some livestock, many of them may have only the minimum necessary for reproduction and may only sell some of their stock at the cost of their future economic reproduction. However, the availability of buyers for the animals and the availability and accessibility of maize meal also play important role in the realisation of the positive Tc by the Somali pastoralists. The increased insecurity in the area and the poor infrastructure for livestock marketing and, the need for bringing in maize meal from outside, tend to disturb the Somali pastoralists' participation in the market.

3 TOWARD THEORY BUILDING

To understand what is happening economically in pastoral societies it is useful to compare cases over a long time, using the core concepts of TLU/capita, TLU/ha, Tc and total and commercial offtake rate. We will start by presenting a decision-making diagram in which these concepts are being used, which is a follow up of work first presented in Zaal (1998, p. 40)

Decision-making diagram concerning the sale of animals

Is it necessary to sell livestock or milk for food security reasons?

Yes: TLU/capita is low
no own crops
no cash income

No: TLU is high enough and milk production sufficient
and/or own crops
and/or own other cash income

or:

Yes: TLU/capita is high
but milk and grain production
fails due to drought; no alternative
cash income or food aid

Direct food self-sufficiency

Is it necessary to sell for non-food reasons?

Yes: forced
tax
clothes
school fees
etc

No

Is it lucrative to sell?

Is it financially rewarding to sell?

No: Low Tc

No sale Distress sale

Food crisis

Yes: High Tc

Willingness to sell in order to buy food

Yes: High Tc

Desire to sell in order to buy luxury goods

Route to the ranch

No

No sale

Are animals available for sale without risking herd or social sustainability?

Yes

No

Distress sale

Herd sustainability crisis

No sale

Are livestock traders available (willing to buy)?

Yes

Actual sale of livestock

No

Possibly:
Land use sustainability (ecological) crisis if TLU/ha becomes too high

Are grain traders available (willing to sell)?

Yes

No > food availability crisis

Is income from livestock sales used to buy food?

No

Yes: buy grains: <u>*Indirect food self-sufficiency*</u>

If TLU/capita is higher than 3 there will generally be no food security problem, if all available milk and meat is being consumed by the pastoral household: going back to the theory at the beginning of this paper: if all TLU are cattle, it means that there are 4 head of cattle per capita. A non-commercial offtake of 12% would mean an annual meat consumption of 12% of 4 animals of 100 kg consumable weight each, or 48 kgs (or on average 130 grams per day). With 2,300 Cal/kg this means about 110,000 Calories. Four cattle, with 60% cows-in-milk and 400 litres per annum per cow gives 960 litres of milk per capita (or 2.6 litre per day). This gives an additional 672,000 Calories. Together these 782,000 Calories give more than 2,100 per average person per day. Together with the consumption of blood, and some fruits, herbs and game gathered from the field this is an adequate diet. The only problem is the seasonality of milk gifts, to be solved by storage techniques, or by having a mix of animal types that have different milk periods.

If TLU/capita is below 3, using the market could still mean that food sufficiency can be maintained. If TLU/capita is only 1.5, and all milk is being sold, while the commercial offtake rate is 12%, Tc has to be 2 and all livestock income has to be spent on grains to enable the pastoralist still to be self sufficient in food. However, many pastoralists will still want to consume most of their milk, while at the same time, a commercial market for milk often does not exist. So in practice milk sales will often be negligible. In that case Tc for livestock has to be 8 (and again: all proceeds have to be used to buy grains) to enable a pastoralist to be self sufficient in food. If the commercial offtake rate is only 8% the Tc for livestock has to be beyond 10, to enable food selfsufficiency. We have seen that in Marsabit, Garissa and West Pokot the average pastoralist has reached this TLU/capita level of less than 2 so the market has to be used at least partly for food security reasons. We have also seen that in recent decades the Tc levels have been good during non-drought periods, and often beyond 10 and certainly beyond 7. In those 'normal' periods livestock traders have always been there to buy animals, even when there were security problems, while at the same time a proliferation of small trading centres, with a few 'general retail shops' and ambulant traders who came to regular market days, often had enough maize meal, or maize grains and other food for sale. Only in 1993/94, during and after 'ethnic cleansing' (chasing out many non-Pokot traders as well) the supply of maize collapsed, and maize prices became very high. With the exception of Kajiado, a pastoral crisis in terms of low TLU/capita levels, could easily be 'solved' by making use of relatively high Tc levels for livestock in non-drought years. High Tc levels for milk were only relevant near the major trading centres and only for a minority of pastoralists with access to these centres. For a minority of pastoralists some additional grain production also served as one of the solutions. In Kajiado the TLU/capita levels for average pastoralists had recovered to food sufficiency levels without needing the market. However, there the rather large inequality meant that for a minority of households the market had to be used to sell livestock to buy grains (and Tc was high enough here as well during most of the time) and some Maasai even started to grow grains structurally, despite the high yield risks involved.

As the evidence of the four case study areas clearly shows, the situation becomes problematic during and immediately after a drought or during and after situations of collapsing security.

- when rains fail milk production for own consumption dwindles; if stored milk gets finished, pastoralists face a food problem, despite TLU/capita levels which might still look 'healthy';
- when dry conditions continue, animal-grains exchange relations become more important and offtake goes up, up to or beyond herd sustainability levels;
- when the drought becomes more severe livestock dies, often not so much because of lack of feed and water, but because of diseases and general weakness; dead animals will not always be eaten due to health risks and food taboos; weak animals which are offered on the market only fetch low prices, if there are traders willing to buy them at all;
- local grain production fails as well, while the occasional production of fruits, herbs and other local food might be negatively affected by the drought as well;
- grain traders will increase their food prices; or are hoarding food, resulting in a much lower Tc and sometimes in a complete market failure (traders are simply not available or willing to sell);
- increasing competing for ever scarcer food, feed and water resources results in increased tension, both within the community and with (ethnic) outsiders and immigrant pastoralists, resulting in higher risks due to insecurity or even warfare;
- money that is available to buy food is often used to buy higher security (guns, ammunition, protection) resulting in a food crisis;
- the assistance by food aid agencies during the drought creates a temporary relief for the emerging food crisis, but might undermine the trading structure; grain traders might be outcompeted and decide to leave the area or stop trading; in a recovery period when food aid has gone, food availability through the market can be a problem, while many pastoralists might rely on that market;
- the much lower feed and water resources create a TLU/ha problem, with deteriorating ecological conditions as a result (e.g. 'circles of destruction' around the remaining water points and -later- around concentrations of food-aid-dependent destitutes. It might take years before the ecological damage is undone;
- during a drought not only animals die, but also calving rates and calf survival rates will be low; the recovery of a herd after a drought takes a few years; in those recovery years offtake rates will be relatively low (and herd rebuilding can sometimes be rapid; see Dahl & Hjort 1976) or else the long-term sustainability of the herd will be jeopardised. Herd composition can be 'abnormal' during a few post-drought years. If too many livestock-killing droughts take place in a short period, recovery is not possible and TLU/capita will structurally be undermined.

We apply a model for 'normal herd growth', based on a base herd of 30 animals (a level which assures independent food security for a family of seven), of which 6 percent are cows and annual calving rate is 85 percent (that is: 15 of the 18 cows have calves). Steers are eaten or sold after 3 years; cows are eaten or sold after 13 years. If nothing disturbs this model situation in year 9 the herd has 150 living animals while during the nine-year period total offtake has reached a total of 88 animals.

If a severe drought attacks the herd in year 7, with 75 percent casualties, no milk production for human consumption during a year, and only 50 percent calving rate, the herd falls back to a level below the independent food sufficiency level and in year 9 the herd has barely recovered. If disaster strikes in years 3 and 6 (same conditions) the herd strength first goes back to only half the independent food security level and after some recovery it falls back to less than one-third of the independent food security level. If Tc levels are adequate the availability of animals for sale can still be a problem, due to the composition of the herd (not enough adult males yet; no old cows), while at the same time the sale of milk could jeopardise herd recovery.

CONCLUSIONS

From precolonial dominance in the control over land, water, herds and knowledge, and even over other people, pastoral groups in Kenya have nowadays become dependent on others to be able to hold on to these resources. There has been growing insecurity, mostly caused by climatic variability and diseases for which they can prepare themselves less well than before, and in some areas by violence and lack of personal security (e.g. raiding in case of the Pokot and large-scale violence in the case of the Somali). More recently, other uncertainties have become more pronounced as well. There is loss of control over and even of ownership of land through privatisation and sale, as with the privatisation of former Group Ranches in Kajiado, with riverine cultivation in the cases of Pokot and Somali and with mountain cultivation in the case of Marsabit. Those who have limited access to resources are now more dependent on increased marketing of produce or on other sources of income. Economic forces, in the persons of livestock and grain traders, and government policies, or politicians, have become important for pastoralists, both in the area close to the political centre (as in the case of Kajiado) and in the area far away from the centre (as in the cases of the Pokot and the Somali).

We have used the TLU/capita figures to get an idea about the food security situation based on home-produced livestock produce. We have calculated that a minimum of 3 TLU/cap. would be needed for a secure and independent level of food acquisition with home-produced livestock products alone. Among the pastoral Pokot this required level of self sufficiency existed until the 1950s. During the droughts of the 1970s it already collapsed to a level below 2 and after the disastrous years 1979-83 it stood at an all-time low of 0.5, to recover slightly in later years. Pokot obviously needed their non-pastoral support system (ethnic relatives in the highlands; own grain production; gold and other non-agricultural activities; aid) to survive the gradual undermining of their pastoral existence. And they clearly needed the livestock market to make use of caloric terms of trade that were generally rather good: between 8 and 16, and in some years even beyond that. In very bad years (like 1983) the trade system virtually collapsed though, with a Tc lower than 2, and very few animals to sell. In the recovery years afterwards many pastoralists who wanted to rebuild their herds and flock needed a considerable time before they could again participate in a livestock market that had already returned to favourable Tc levels.

Among the Maasai the TLU/capita levels have never been lower than 3 (in 1962) and currently they are such that on average pure pastoralism could give a solid foundation for food security (above 5). Here we have a situation in which not food exchange (using good Tc levels) necessitates market participation, but a wealth accumulation strategy. High Tc levels (Tc = 7-11; although generally lower than those among the Pokot; despite the nearby Nairobi market) give this accumulation strategy a solid basis. The Tc situation for the Maasai seems to be less fluctuating though compared to the Pokot and hence is more secure. In the worst year (1975) the Tc did not drop below 4. For the Maasai the problem is the rather large inequality in livestock ownership, which means that for considerable numbers of households the TLU/cap. situation does not enable a purely pastoral food basis. For them market participation and using the lucrative Tc levels is needed for food security purposes.

The Somali situation in Garissa District and the situation in Marsabit is different. Like the Maasai, the Somali, Rendille, Gabbra and Boran had a TLU/cap. situation that enabled a purely pastoral life for a long time, and like them they actively participated in the livestock market for the purchase of other goods and as part of an accumulation strategy, but at rather low (officially recorded) commercial offtake rates. Around 1990 the system collapsed and this happened much faster than the Pokot experienced in their pastoral crisis. TLU/cap. levels went down to 1.5 and large numbers of Somali, Boran, Gabbra and Rendille have become destitute and dependent on international charity. The fieldwork during the severe drought of 1996-97 in Garissa enabled a precise reconstruction of the development of Tc levels during a crisis. It is interesting to see that the Tc situation in the major centre, Garissa town, and in the centre near the refugee camp, Dadaab, was not bad at all, although the Tc became lower when the drought became more pronounced. The Tc levels in these centres were clearly good, compared to the Pokot and even Maasai figures during droughts in the past. A large demand for animals from the rest of Kenya, and the maintenance of a security situation that was within the margins of acceptability for traders and truck drivers on the Dadaab-Garissa-Nairobi road, enabled relatively high livestock prices, while the existence of the huge refugee camp in Dadaab with an ample food supply under the responsibility of UNHCR kept the maize price low. In far-away Ijara, though, the situation was far worse: security was bad; livestock transport was very risky; livestock prices were low and became ever lower, while the price of maize meal went up. The result was a Tc close to 2. This points at a major crisis, but is still above parity!

Coming back to the first of the issues raised in the beginning of this paper, commoditisation does seem to be an interesting strategy to ease the tension between pastoral production capacity and household food needs. Lucrative caloric terms of trade seem to be the rule even in times of crisis.

Requirements at the market level for commoditisation to be this interesting are numerous. Liberalisation of the livestock, meat and grains markets has helped in food provision in the Districts and in improving the marketing of livestock. The commercial system that developed has had favourable effects in Kajiado District, but less so in West Pokot, Marsabit and Garissa Districts. The food aid for refugees in the Dadaab part of Garissa also had favourable effects on the caloric terms of trade for pastoralists. A group of influential businessman and (ex-) politicians has seen the opportunities and have started in this business, which has helped in developing a slaughterhouse and butchery sector in all three Districts, although at the social cost of increasing inequality. In general, as the economy in Kenya is heavily influenced by political decision making, involvement in marketing has its risks as well. Conditions may suddenly change, as is the case with the redevelopment of the KMC as a private enterprise, at the cost of the smaller scale slaughterhouses. Conflicts between ethnic groups has disrupted markets in Kenya before. Developments that work out positively for pastoralists are there as well. The exchange rate of the Kenya shilling became suddenly of interest to producers in the southern part of the country, and it provided the Kajiado Maasai with an alternative market when the market in Kenya stagnated in 1993. The breakdown of the Somali state and its currency provided Garissa-based traders with a lot of new opportunities.

We found that growing commoditisation does take place in all four Districts and that there are two distinct roads to commoditisation: the road to survival and the road to the ranch. The first road can be explained by a gradual decrease in the TLU per capita figures, especially among the pastoralists at the lower end of the wealth spectrum. In the Pokot society these form the large majority of the remaining pastoralists, after the disasters of the 1979-82 period. In the Somali and Marsabit society this also seems to be the case, after the 1996-97 drought in particular. In the Kajiado Maasai situation they form a minority. The second road is not forced by decreasing livestock-based food production per capita, but by an increasing need to improve livestock productivity through purchased inputs, by pastoralists following an accumulation strategy at the upper end of the wealth spectrum. This road is followed by a rather large group among current Maasai herders and by only a small group among the Pokot, the Somali, the Gabbra, Rendille and Boran. People who are involved in the accumulation strategy try to diminish risks related to the market by connections with politics and politicians (that is, if the politicians don't already form a large segment of these accumulating pastoralists).

In all four societies a clear process of wealth differentiation is visible. Among the poor, we see a strategy of diversification of sources of income, in which livestock-related activities are only part of a broad 'survival package'. Among the rich both specialisation and diversification are found. Where marketing perspectives for livestock are good and stable, specialisation is a safe option.

To understand what is happening in current pastoral development in Kenya, it is interesting to use the concept of caloric terms of trade between livestock and grains (or maize meal), but it is clearly not enough to explain all the changes, certainly not for the more wealthy pastoralists. The whole package of purchases and sales should be included in the analysis; as part of an overall analysis of all the trends in commoditisation, including inputs, land and labour.

Our analysis shows that pastoralists do have three more types of decisions to take, after the decision that the Tc is interesting enough to market livestock (as it usually is), and assuming that the markets of livestock and grains actually function (which in a Kenyan context has almost always been the case): 1) the decision to deplete the herd and flock, 2) the decision to really sell an animal, and 3) the decision about what to do with the money. The first decision depends on the availability of ‘excess animals’, beyond the perceived minimal reproduction necessities of the herd and flock: are there young males available (preferably mature) and are there old cows? After a period of crisis, rebuilding a herd and flock takes at least four respectively two years and during that period exchange possibilities for herders with low numbers of animals are very meagre: they can not easily depend on Tc levels, even if these are very good, for their day-to-day food security. Selling non-excess animals for them means slowing down the process of rebuilding a viable herd and flock. If excess animals are available it can sometimes be preferred to give them away within a social network, to strengthen ties and to improve indigenous social security arrangements; or it can be preferred to slaughter an animal for a social or ritual occasion, often also to cement social ties. In all groups that were studied this still happens, although in relative terms probably much less than a generation ago. The third decision, about what to do with the money, depends on the decision making structure within the household and on the food situation. Even if the acquisition of grains (or other food bought on the market) should get the highest priority from the point of view of household food needs and health situation, the money is not always actually spent on necessary food. As women are generally the major providers of household food, in food crisis situations it is of utmost importance for them either to be able to rely on her husband’s willingness to spend part of his livestock sales money on food for the family, or to be able to sell milk and animals (often smallstock) herself.

Finally we have seen how important it is for the viability of the pastoral sector that droughts, if they take place, are spread over time. Too many droughts close to one-another undermine the recovery capacity of the pastoral sector. For a market-dependent pastoral sector this is even more clear, as not only the TLU/capita is negatively influenced by a drought, but the Tc as well. In addition the TLU/ha situation during a drought may cause such tensions, both ecologically and socially that rebuilding a herd and flock in post-drought periods becomes impossible. Both in West Pokot, in Garissa and in Marsabit such a dangerous situation has arisen, in Pokot during the 1980s and in Garissa and Marsabit during the 1990s. For the Maasai of Kajiado the situation seems to be completely different and they seem to be in a league of their own: they recovered from prior disasters; they have never had higher TLUs; their TLU/capita situation would still enable them to be market independent. And still many of them have high commercial offtake rates, using the high Tc ratios, and the proximity to the important markets of Nairobi and Mombasa. Many Maasai sell, not because their survival is at stake, but because they are on a 'route to the ranch'. Their traditional pastoralism -as far as it still exists- is challenged as well, not by disaster but by opportunity.

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