Pastoral culture and range management: Recent lessons from Maasailand

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Summary

LIVESTOCK DEVELOPMENT *planning in Africa has frequently been a case of 'planning without facts'. Pastoral systems are particularly poorly understood and development planning has been largely unsuccessful. In the absence of facts, planning has, of necessity, been based on prevailing assumptions about pastoral production, many of which appear to be outmoded.*

This paper reviews the appropriateness of three major assumptions underlying pastoral development in East Africa. These are the economic irrationality of pastoralists, the unchanged nature of pastoral production systems, and the applicability of Western models to pastoral development in East Africa.

It now seems clear that without a thorough understanding of the pastoralists' goals and strategies and without their participation in planning, pastoral development is unlikely to be successful. This is particularly important given the rapidly changing circumstances of pastoral production. African rangelands are not so much overstocked as overpopulated. Pastoral production needs to be intensified in order to support the increasing human population, but Western models, based on low labour and high capital inputs, have limited applicability in Africa. Another lesson is that degradation can only be fully understood in terms of the wider social, economic and political context of production.

Introduction

The lack of information on pastoral systems has frequently been noted (Sandford, 1976, 1983; Raikes, 1981), and in a recent symposium on pastoral development it was concluded that "quantitative data relative to pastoral systems (including human population, herd demography, biotic composition) are notoriously unreliable" (USAID, 1980, p. 5). In a review of the literature on agricultural development in sub-Saharan Africa, Eicher and Baker (1982) noted that "research on the behaviour of livestock herders in Africa is about at the same point where research was on the economics of crop production some 20 years ago – many assertions and a sparse supply of facts" (p.168). Longitudinal data on such critical factors as human and livestock populations and range degradation are particularly lacking.

The paucity of data has meant that millions of dollars are being chanelled each year into livestock projects throughout Africa without a sound knowledge of livestock production on the continent (Eicher and Baker, 1982). Interventions in pastoral systems are often based on prevailing assumptions about the nature of pastoral production and the direction in which it should be transformed (Sandford, 1976).

Over the past 50 years there has been increasing alarm that extensive and irreversible rangeland degradation is occurring in East Africa, and that urgent action is required (see Great Britain, 1934; Brown, 1967; Glover and Gwynne, 1961; Spooner and Mann, 1982). It has been assumed that this degradation has been brought about by the irrational desire of pastoralists to accumulate vast herds, under a management system largely unchanged for millennia and characterised by the 'tragedy of the commons' exacerbated by the recent human population growth. It has been further assumed that the solution lies in the commercialisation of production based on Western models. Such assumptions underlie major programmes intended to alter radically livestock production and land tenure in the pastoral areas of Kenya, Botswana and, to a lesser extent, Sudan (Grandin, 1981; Republic of Botswana, 1975; Behnke, 1986).

Although serious gaps still remain, the knowledge of pastoral production systems has greatly advanced during the last 10 to 15 years. This paper examines the validity of three major assumptions of pastoral development: the economic irrationality of pastoralists, the unchanged nature of pastoral production systems, and the applicability of Western models to pastoral development in East Africa. The model of the 'tragedy of the commons' (Artz, 1984; Gilles and Jamtgaard, 1981, 1982; Grandin, 1985b) will not be discussed here. The paper is based primarily on recent literature on East African pastoralists and the author's own field research in Kenya's Maasailand.

Economic rationality and the goals of pastoralists

One of the more persistent arguments in rangeland development is the issue of the pastoralists' economic rationality or the lack thereof. In outlining what he calls the 'mainstream view' of range development, Sandford (1983, p. 15) noted that this view is based on a distrust of traditional economic and social systems, and suspicions that pastoralists are irrational.

Raikes (1981) was more vehement in his appraisal of East African sentiments:

> One problem which must be confronted at the outset is the widespread view that pastoralists and other herders are economically (or sometimes without qualification) irrational; this being evidenced by their assumed benefits .... and phenomena like preferences for particular colours of cattle or shapes and sizes of horns. One might suppose that this sort of thinking had largely disappeared with the colonialism which spawned it, but one would be wrong. It is widely assumed among officials and politicians in East Africa that pastoralists are irrational (pp. 23–24).

He also cited a local newspaper correspondent who called the Barabaig pastoralists "ignorant and barbarian" with small and backward minds.

The current allegations that pastoralists are irrational echo Herskovits' (1926) description of the so-called 'East African cattle complex', according to which East African pastoralists had sentimental attachments to their cattle, disliked killing them, and used them in ways very different from Westerners–in rituals, as a source of power, prestige etc. The idea was seized upon by colonial officials (Mair, 1985) and by numerous social anthropologists, who, following prevailing social theories, were intent on proving that non-Western people and institutions were qualitatively different from Western ones. Neo-classical 'economic' analysis was deemed inapplicable to the non-Westerner.

The debate on the form of economic analysis most suitable for non-Western systems raged throughout the early 1970s. It was then gradually accepted by most anthropologists that the issue was fallacious, predicated on the assumption that in acting 'economically', the Westerner is not acting 'culturally'. Perhaps the most cogent exposition of the rationality problem is found in Cancian (1972), who states: "Economic man always operates within a cultural framework that is logically prior to his existence as economic man; and this cultural framework defines the values in terms of which he economises" (p. 191).

Success takes different forms: it might entail owning many animals, many yams, a large home, an expensive car. It is important that we do not compare pastoral producers with a Western ideal of a culture-free, profit maximiser (who, in any case, does not exist). It is also important that we understand the institutional structures beyond the control of the individual, which affect his or her possibilities for action. On the whole, pastoral producers are poorly incorporated into the market economy; they live in an uncertain world, where family and friends rather than the corporation or the state provide security, both present and future. By understanding the goals and the context of pastoral production, we will be in a far better position to suggest appropriate policy initiatives, as well as development opportunities at the local level.

Lipton (1968) made an important contribution to the issue by explaining the goals of traditional subsistence production. He argued that because of risk and the need for security, traditional producers do not always allocate resources in such a way as to maximise short-term output. He also noted that "many superficially odd village practices make sense as disguised forms of insurance" (p. 341).

Over the past 15 years, numerous studies have been carried out in order to obtain better understanding of the strategies used by peasant farmers to avoid risk (Berry, 1976); they have confirmed that the farmers' practices are aimed at ensuring a minimal level of subsistence security under the most unfavourable circumstances. Thus an innovation will not be adopted unless it does as well as an existing practice under poor conditions, irrespective of how successful it is in good years (Dillon and Anderson, 1971; Hunt, 1984).

Recent evidence shows that pastoral producers also adopt certain strategies to void risk. The primary goal of pastoral production is subsistence security in the short and long term, which is largely achieved through the accumulation of animals (Dyson-Hudson and Dyson-Hudson, 1970; Grandin, 1983; Galvin, 1985; Ensminger, 1982). Large numbers of animals are required for subsistence especially when the availability of agricultural foodstuffs is limited (Brown, 1971; Dahl and Hjort, 1976). In addition, animals provide long-term security in the event of epidemics and droughts and constitute the sole inheritance for the pastoralists' children.

Other risk-aversion strategies used by pastoralists include species diversification, splitting herds and flocks, and stock lending. Animals play an important role in developing and maintaining social ties with kinsmen, age mates and friends, both near and far, which form the network of security insurance for the pastoral household. Friendships made with people in distant places through lending or exchanging stock enhance the pastoralists' possibilities for movements during droughts and increase their chances of being able to acquire animals after a disaster.

Those who advocate a 'loosening' of the pastoral social organisation in order to facilitate commercialisation of production should realise that this would invariably lead to a breakdown of the traditional social security functions of the entire community. Its short-term consequences will be twofold: pastoral households will start placing greater emphasis on risk aversion practices,

and the impoverished pastoralists will begin to rely more and more on the national economy for their subsistence – either through famine relief or by seeking non-pastoral employment.

In addition to herd accumulation and the maintenance of social ties, pastoralists had a number of other strategies for coping with seasonal and annual fluctuations in food supply. These included reliance on wildlife and, where possible, agricultural foodstuffs (obtained by trade or minimal cultivation). The Maasai, for example, are often cited as representing the extreme of dependence on direct consumption of livestock products. However, there is ample evidence that they also exchange food with neighbouring agriculturalists, especially in time of drought. Traditionally, the Maasai also had a symbiotic relationship with Ndorobo hunters and gatherers (Bernsten, 1979); they are said to have regularly consumed the meat of wildebeest and eland.

In some cases pastoralists changed even their mode of subsistence and ethnic affiliations to ensure their survival (Jacobs, 1968). As Bernsten (1979) observed, "The relationship between Maa-speaking pastoralists, farmers and hunters was not static, but dynamic... individuals moved between these three modes of subsistence according to their economic status at a given time" (p. 109). Little (1983) noted a similar phenomenon for the I1 Chamus near Baringo. In modern times, the Maasai have largely lost this flexibility for subsistence security, first through the imposition of national boundaries, and more recently through the enforcement of a hunting ban and land alienation and tenure change, which have cut them off from many high-potential refuge areas (Grandin and Lembuya, 1987).

Changing circumstances of pastoral production

Many of those who willingly accept the utility of culture as man's form of adaptation (rather than merely a hindrance to development) question the ability of culture to adapt quickly enough to the rapidly changing circumstances of modern times (e.g. Strange, 1980). There is a tendency to refer to pastoralists as if they have remained the same for hundreds of years (if not millenia), or as if it is only in the last few decades that change has been required. However, the evidence is overwhelming that East African pastoralists have experienced nothing but change for at least a 100 years, and probably much longer. In this section, three aspects of change will be briefly examined: the crash of livestock systems in the 1890s, changes in territorial organisation in the 20th century and the recent population explosion.

The crisis in the 1890s

Having examined carefully the records of early explorers and German colonialists in Tanzania, Kjekshus (1977) noted that 100 years ago there were intensive pastoral and mixed-farming systems in East Africa, despite the slave trade. Beginning in 1890, the area was hit by a disaster the proportions of which it had probably never previously experienced.

The crisis was rooted in three external factors, in addition to the slave trade. Rinderpest (an exotic disease probably introduced with cattle imported by the Italians into Ethiopia) worked its way down the Rift Valley, decimating herds. Cattle mortality is estimated to have reached 90 to 95%. This led to widespread famine as both pastoralists and smallholder farmers lost an important means of livelihood. A serious smallpox epidemic followed. Lastly the jigger (sand-flea) also arrived in East Africa in the 1890s, further undermining the local production systems by debilitating the few surviving workers.

Kjekshus (1977) concluded that at the time of serious colonial intrusion, the East African communities were in a state of total collapse–entirely due to these external factors. Colonialisation only hastened the rate of change.

Changes in territorial organisation

The changes imposed in the 20th century in territorial organisation and control are among the most important that pastoralists have experienced. The Maasai in Kenya may be taken as a case in point.

Huntingford (1953) briefly traced the history of Maasailand: in 1889, the 155 400 km^2 of Maasailand was divided between Britain and Germany; in 1904, two non-adjacent Maasai reserves were formed in the British territory, one in Laikipia and the other due south of Nairobi. In 1911, the northern reserve was eliminated, and by 1913 the non-Samburu Maasai were all evacuated to an expanded southern reserve, reducing Maasailand to approximately 38 850 km^2. Since then, however, further alienation has taken place, particularly through the formation of game reserves and encroaching agriculture (Campbell, 1981). This territorial shifting was accompanied by the imposition of colonial administrative structures which further undermined the traditional political and social system of the Maasai.

The most recent territorial change of major proportions in Kenya's Maasailand has been the adjudication of the tribal land and the development of group ranches, creating completely new levels of social organisation (Halderman, 1972; Hedlund, 1971; Galaty, 1980; Grandin, 1981). The objective of this government policy has been to settle people and livestock, while wildlife are left to exploit scattered forage.

Before the formation of group ranches, access to grazing was obtained through membership in a section or subtribe. In the Kajiado District, the average section was over 2000 km^2. In normal years, producers tended to use only a portion of their section; in times of drought, however, even cross section movement was facilitated. The Kaputiei section, which was about 3100 km^2, was divided into two subsections of roughly 1000 and 2100 km^2; the latter had three socially distinct locations. In comparison, the mean size of the 15 Kaputiei group ranches is only about 160 km^2. This reduction in grazing area has important implications for production considering East Africa's highly erratic and scattered rainfall. Sedentarisation reduces the possibility of avoiding the incursions of wildebeest which carry malignant catarrhal fever. It also cuts off access to distant natural salt licks.

In summary, the Maasai, as other East African pastoralists, have had to adapt to major territorial and organisational changes in this century. Galaty's (1980) comment on group ranches is widely applicable; he noted that the programme represents "a positive innovation precisely because of its limitations, for in the cracks and crevices of its organisation, Maasai may be able to make it work through their own system" (p. 169).

Population growth

One of the most important sources of change throughout the continent has been the unprecedented rate of population increase in recent decades. Available statistics suggest that Kenya has the highest rates of population growth in the world, estimated at over 4% per annum (Kenya, 1986).

The natural increase of population has fostered internal migration. Whereas in earlier decades the trend was from rural to urban areas, recently the migration trend in Kenya has been predominantly from rural to rural areas (Hunt, 1984; Livingstone, 1981; Ominde, 1984; Campbell, 1979; Jacobs, 1983). Having reviewed population changes in Kenya between the 1969 and 1979 censuses on a district-by-district basis, Jacobs (1983) concluded that "a substantial portion of the migration trend was not only rural to rural, but from rural arable lands to rural rangeland areas ... inmigration of mixed farmers ... was a dominant trend... in virtually all rangeland districts" (p. 927). He estimated that the population increase at the national level was 39%. During the same period, the mean increase in Kenya's 11 pastoral districts was 45%, largely in ecozones IV and V. For example, the population of the Kajiado District increased by 74%, while that in Narok increased by 68%.

Thus pastoralists have had to adapt in order that their increasing numbers could be supported on less land, within a changed administrative and economic structure. They have done this in a number of ways, including changing their customs of both food production and consumption. The Maasai can again be taken as an example.

In some areas, the Maasai have considerably increased their smallstock holdings in the last 20 years (Njoka, 1979; Grandin, 1981, 1985a). This allows more complete utilisation of available vegetation leading to increased productivity per unit of land, makes use of the increased availability of labour, and spreads risk. Despite a strong traditional taboo on digging, more and more Maasai are turning to crop production. Njoka (1979) estimated that by 1977, half of the Maasai in Kaputiei had tried cultivation to offset losses from the previous drought years. In areas where irrigation is possible, Maasai have also started growing cash crops. There has been some out-migration of Maasai men from the Kajiado District to Nairobi and Mombasa, where they seek unskilled jobs, largely as watchmen.

Food consumption patterns, often cited as a part of culture most resistant to change, have also been altered. This is particularly noticeable in the case of the pastoral Maasai, who have been known to subsist largely on milk, meat and blood from cattle. Referring to his work in Tanzania from 1956 to 1958, Jacobs (1965) noted: "The milk, meat and blood of their livestock form the staple diet of pastoral Maasai. Their main food is fresh cattle milk, and they frequently subsist for weeks on nothing more..." (p. 148). Blood from bullocks was used "especially in the dry season when milk supplies were short". Purchased maize flour and honey beer comprised important food supplements for poor families in the dry season.

The Maasai's diet, traditionally consisting chiefly of milk, has recently undergone significant changes. For example, in the relatively good years of 1981–1983, large-scale purchases of foodstuffs (particularly maize) were recorded on three group ranches (ILCA, 1983). Maize was purchased by poor households throughout the year and by rich households most of the time. Grain purchases are financed almost exclusively by cattle sales. Cattle bleeding has never been recorded by the ILCA team, not even during the 1984 drought and its aftermath. Rather, studies of herd composition showed that mature steers accounted for only 2% (King et al, 1984). ILCA's studies also showed that because of increasing availability of, and dependence on, agricultural foodstuffs, the Maasai no longer keep male animals long past maturity for bleeding; they sell them to obtain cash for purchasing household needs and production inputs.

Boserup (1965, 1981) suggested that population growth has been the driving force for intensifying agriculture in preindustrial societies. After industrialisation there is often the choice of either remaining and intensifying production or seeking wage labour. The evidence available

for East Africa indicates that increased population density has led to both strategies being employed by the pastoralists, along with an increased substitution of dairy products with agricultural foodstuffs.

Population density in East Africa is high (2–5 persons/km^2) and increasing at a rate unprecedented in human history. All too often in the past, it has been assumed that the 'surplus' pastoral population would have to find alternative means of livelihood so that degradation could be stemmed and 'proper' rangeland development could take place. It is increasingly obvious that this is not possible.

Livingstone (1981) and Hunt (1984) noted that the Kenyan labour force (reckoned at 7.2 million in 1980) would almost double by the year 2000. Advances in population control will not ease this situation; the future labour force entrants are already born. Even the most optimistic projections indicate that over 5 million people will have to find employment in the rural sector, mainly in agricultural production (Hunt, 1984).

Rangeland development must be put in the national context; the pastoral population cannot be wished away. The ministries involved in range development need to heed the warning of those working to stem the flow into urban areas. Clearly, a major effort must be made to find suitable means to increase and sustain the output from the East African rangelands, primarily through increased use of labour per unit land, so that they can support their expanding population decently as well as contribute to the national good. Pastoralists have and are willing to change, but sensibly, not at the expense of their subsistence security.

The applicability of western range management to east Africa

Extensive Western-style range management techniques presuppose low population density, high cost of labour relative to other inputs, a high level of infrastructural development (including transport), and secure markets to sell animals and purchase food and production inputs. Yet few of these conditions prevail in East Africa. Rather, labour is abundant and cheap, capital is scarce, and the infrastructure is poorly developed.

Pastoral systems are often compared unfavourably to Western ranching systems, especially with regard to productivity per unit animal. It has been recognised, however, that pastoralists are not attempting to maximise output per unit animal. They are more concerned about a secure output (as discussed above) and output per unit area of land.

Evidence abounds that East African pastoral systems, with high labour but low capital and fossil fuel inputs, have a higher output per unit area of land than extensive Western ranching enterprises. As Africa is facing a severe food security crisis, it is instructive to consider productivity in terms of protein output per hectare and labour and fossil fuel utilisation for a number of systems in the semi-arid areas of East and West Africa, the United States and Australia (Table 1).

Table 1. *Livestock productivity and factor ratios in semi-arid areas.*

Region, system	Factor ratio			Source
	Protein output (kg/ha/year)	Land/Labour (ha/man-year)	Fossil fuel/Labour (10^6 Kca1/ man-year[a])	
USA Ranching	0.3–0.5	3000-6000	48–67	Krummel and Dritschilo (1977) quoted in Breman and de Wit (1983)
Australia Ranching	0.4	4000	287	
Sahel Transhumance	0.6–3.2	38	0	Breman and de Wit (1983)
East Africa Kajiado Group Ranch	3.4	30	0	Grandin (unpubl. data); de Leeuw et al (1984)
Karamojong, pastoral	3.6	10	0	Dyson-Hudson and Dyson-Hudson (1970)
Borana, pastoral	2.1[b]	120	0	Cossins (1985)

[a] 1 man-year = 1900 hours of work per year.
[b] Offtake only; excludes herd accumulation.

Calculated per hectare of land, production of meat and milk protein in pastoral systems exceeds that of ranching systems up to tenfold. Whereas on Western ranches one person may manage 4000 ha, the same area would employ over 100 workers under pastoral management. In Western systems, the use of fossil fuel is high; it is virtually non-existent in pastoral systems. ILCA researchers (de Ridder and Wagenaar, 1984; 1986) compared traditional with Western-style ranching systems in Botswana and concluded, "... traditional systems in eastern Botswana can thus be considered as 95% more productive in terns of liveweight production equivalents than ranching systems on a per hectare basis" (1984, pp. 5–7).

To complete the comparison, it is useful to consider game ranching and mixed game/livestock ranching, both of which have been suggested as possibilities to exploit further Kenya's rangelands. Precise data on game/livestock ranching are not available, but estimates have been made.

McDowell et al (1983) have simulated the costs, returns and labour requirements of various types of commercial ranches in an environment similar to that of the Olkarkar Group Ranch. According to their calculations, an unfenced mixed game/cattle ranch of 8100 ha would produce approximately 2.1 kg of protein per hectare, and employ approximately 60 people at a below-subsistence wage of KSh 400/month. Its total annual costs would be about US$ 10/ha of which only about US$ 2 would be for labour. "Acquiring such large funds in Kenya's troubled financial

sector would be extremely difficult" (p. 51), concluded the researchers. We might add that given the employment needs of Kenya, the generation of such low levels of wage labour per unit land and per unit capital invested should be questioned.

Although game ranching *per se* would be problematic, better utilisation of game in Kenya's rangelands could contribute significantly to both national and local revenues. If pastoralists are to bear most of the burden of wildlife outside national parks (through loss of grazing, disease and predation and, in some areas, damage to crops), they can rightfully expect to gain some benefit.

In Western systems, returns to labour are very high, while returns to land are very low. The reverse would appear to be true in East Africa. Although evidence indicates that combined milk and meat production gives higher offtake per unit area than beef alone, rangeland development programmes have emphasised only beef production. Smallstock and camels play an important role in some pastoral systems; yet they are largely ignored in research and development activities. The same could be said of wildlife.

Western ranches are commercial enterprises whose primary objective is to maximise their profits through the supply of meat and milk for consumption and export. When compared with Western systems, the East African rangelands appear to contribute relatively little to the national good, but such comparisons ignore the large local population they support. Yet the commercialisation of pastoral production has often been regarded as one of the most essential ingredients of range development, and commercial offtake as the only important component of the output from rangelands.

Of necessity, pastoralists are being increasingly incorporated into the national economy. However, if the commercialisation of pastoral production is to be successful, national governments must address two tasks. The first is to review current pricing policies for livestock products and to promote alternative investment opportunities for pastoralists. The second is to develop the infrastructure that would facilitate the incorporation of the pastoral system into the national economy. Transport and markets must be developed to ensure a reliable offtake of pastoral products (including wildlife products) from the rangelands (Sandford, 1982), as well as the provision of essential production inputs and household necessities.

Security, the fundamental characteristic of subsistence production, has important implications for the response of pastoralists to commercialised production. Commercial production will have to provide as good a quality of life as the traditional system, and as much security in the face of seasonal variations and longer-term cycles of boom and bust. Until such security is perceived to exist, it cannot be expected that the pastoralist will give up any practices aimed at ensuring his survival.

The change from subsistence to commercial production, if it occurs, will take time. It will require confidence in the government's ability to ensure the supply of basic inputs. Each time there is a shortfall of agricultural foodstuffs in pastoral areas, or a problem with outlets for offtake, the pastoralist will be encouraged to continue his subsistence strategy. For example, the lack of reliable sources of agricultural foodstuffs has been identified as a major problem for the Rendille. Sobania (1979) concluded that the historically low offtake rates among the Rendille were caused more by unreliable marketing than by the pastoralists' unwillingness to sell animals.

Marketing security will be particularly important in drought periods (Sandford, 1983). During the recent drought in Kenya, the existing marketing channels proved to be inadequate, such that the supply of animals to the Kenya Meat Commission abattoir quickly exceeded capacity. Food distribution was problematic in many areas, and the terms of trade were unfavourable to pastoralists. In Wamba town in Samburu District, for example, there were many weeks when no foodstuffs were available to purchase or were in such a limited supply and sold so quickly that only town dwellers were able to obtain them. The Samburu resorted to slaughtering goats to ward off starvation, and many went hungry (Sperling, 1987). Although food supplies were more abundant in Maasailand, there were periodic shortages and constant concern on the part of the pastoralists about their continuity. Such experiences will have confirmed the pastoralists in their strategy of self-reliance for perhaps another generation.

Conclusions

In summary, there are major lessons from the last two decades:

Causative factors

Theories about what causes rangeland deterioration abound, many of which emphasise such immediate causes as overgrazing while ignoring the wider social, economic and political factors (Spooner, 1982). There has been a history of alarmism leading to an uncommon haste to change traditional systems, which is now being tempered by a recognition that not enough is known about these systems to effect acceptable changes.

Overpopulated range

The rangelands are not so much overstocked as overpopulated. Given the environment, and the need for subsistence security in the short and long term, it is clear that most pastoralists do not keep more animals than they need; many in fact do not have enough. Large numbers of animals are not a matter of cultural conservatism but a means of survival.

Intensified pastoral production systems

Western models of range management are largely inapplicable in Africa because of the high population densities in the continent, low cost of labour relative to other inputs, and scarcity of development infrastructures. It is now recognised that rangelands *must* support an increasing human population. This will require an intensification of pastoral production systems, which has important implications for current range research and development activities. In addition, pastoralists must be incorporated into the national economy to such a degree that they will be able to rely on a regular supply of foodstuffs and market their own products in a predictable manner.

Cultural considerations

Development projects in rangelands have often ignored the pastoralists' needs and goals, leading to many failures. This attitude has largely been due to the dubious assumption that pastoralists are irrational or culture-bound in clinging to large numbers of animals. Thus, top-

down decision making *for* them, rather than *with* them, was deemed necessary (and done in haste to preempt the rapid deterioration of rangeland conditions).

However, it is increasingly accepted that the strategies adopted by pastoralists stem from the need to ensure the survival of a rising human population under harsh ecological conditions and a changing institutional framework. Pastoralists have changed and will continue to do so as conditions demand and/or allow, but with minimum jeopardy to their own survival. Pastoralists must be incorporated into the decision-making process influencing their future and that of the lands they currently occupy (USAID, 1980; Galaty et al, 1981; Sandford, 1983) if acceptable interventions are to be found.

References

Aronson D R. 1981. Development for nomadic pastoralists: Who benefits? In: J G Galaty, D R Aronson, P C Salsman, A Chouinard (eds), *The future of pastoral peoples.* Proceedings of a conference held in Nairobi, Kenya, 4–8 August 1980. IDRC, Ottawa.

Artz N E.1984. A critique of the "tragedy of the commons" paradig in pastoral development policy. Draft paper, College of Natural Resources, Utah State University, Logan, USA.

Behnke R. 1986. The implication of spontaneous range enclosure for African livestock development policy. Alpan Network Paper No. 12. ILCA, Addis Ababa.

Bernsten J L. 1979. Economic variations among Maa-speaking peoples. *Hadith* 7: 108–127.

Berry S S. 1976. Risk and the poor farmer. Paper prepared for Technical Assistance Bureau, Agency for International Development, under Purchase Order Contract AID/ CM/TA-147–491 No. 3158443. Boston University, Massachusetts.

Boserup E. 1965. *The conditions of agricultural growth: The economics of agrarian change under populations pressure.* Aldine Publishing Company, Chicago.

Boserup E. 1981. *Population and technology.* Basil Blackwell, Oxford.

Breman H and de Wit C T. 1983. Rangeland productivity and exploitation in the Sahel. *Science* 221:134–1347.

Brown L.1967. Problems of wildlife in the grazing areas of Africa. In: *Proceedings of the 2nd International Seminar on Integrated Surveys of Natural Grazing Areas.* ITC/UNESCO.

Brown L.1971. The biology of pastoral man as a factor in conservation. *Biol. Conserv.* B: 93–100.

Campbell D J. 1979. Development of decline: Resources, land use and population growth in Kajiado District. Working paper 337. Institute for Development Studies, University of Nairobi.

Campbell D J. 1981. Kajiado District: Case study. In: D J Campbell and S E Migot-Adholla (eds), *The development of Kenya's semi-arid lands.* Occasional Paper 36, Institute for Development Studies, University of Nairobi. pp. 212–241.

Cancian F. 1972. *Change and uncertainty in a peasant economy.* Stanford University Press, Stanford, USA.

Cossins N J. 1985. The productivity and potential of pastoral systems. *ILCA Bulletin* 21: 10–15.

Dahl G and Hjort A. 1976. *Having herds.* University of Stockholm, Stockholm.

Dillon J L and Anderson J R. 1971. Allocative efficiency, traditional agriculture and risk. *Am. J. Agric. Econ.* 53(1): 26–32.

Dyson-Hudson R and Dyson-Hudson N. 1970. The food production system of a semi-nomadic society: The Karamojong, Uganda. In: P F McLoughlin (ed.), *African food production systems,* Johns Hopkins Press, Baltimore, Maryland. pp.93–123.

Eicher C and Baker D. 1982. *Research on agricultural development in sub-Saharan Africa: A critical survey.* MSU International Development Paper 1. Department of Agricultural Economics, Michigan State University, East Lansing, Michigan.

Ensminger J. 1982. The effects of increasing Galole Orma participation in the cash economy. Paper presented at the annual meeting of the American Anthropological Association, Washington, D.C., December 1982.

Galaty J 6.1980. The Maasai group ranch: Politics and development in an African pastoral society. In: P C Salzman (ed.), *When nomads settle.* Praeger, New York.

Galaty J G, Aronson D R, Salzman P C and Chouinard A. 1981. *The future of pastoral peoples.* Proceedings of a conference held in Nairobi, Kenya, 4–8 August, 1980. IDRC, Ottawa.

Galvin K. 1985. Food procurement, diet, activities and nutrition of Ngisonyoka, Turkana pastoralists in an ecological and social context. Submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Anthropology at the Graduate School of the State University of New York, New York.

Gilles J L and Jamtgaard K. 1981. Overgrazing in pastoral areas: The commons reconsidered. Mimeo. Department of Rural Sociology, University of Missouri, Columbia, Missouri, USA.

Gilles J L and Jamtgaard K. 1982. The commons reconsidered. *Rangelands* 4(2): 51–54.

Glover P E and Gwynne M D. 1961. The destruction of Maasailand. *New Sci.* 24: 450–453.

Grandin B E. 1981. Group ranches in Kaputiei: The impact of the Kenya Livestock Development Project, Phase I. Internal Report, Kenya Rangelands Programme, ILCA, Nairobi.

Grandin B E. 1983. The importance of wealth in pastoral production: A rapid method for wealth ranking. In: *Pastoral systems research in sub-Saharan Africa.* Proceedings of the workshop held at ILCA, Addis Ababa, Ethiopia, 21–24 March 1983. ILCA, Addis Ababa.

Grandin B E. 1985a. Functions of sheep and goats in the Maasai production system. Paper presented at the SR/CRSP Kenya Workshop, held at Kakamega, Kenya, March 1985.

Grandin B E. 1985b. East African pastoral land tenure: Some reflections from Maasailand. Paper presented at the International Workshop on Tenure Issues in Agroforestry -"Land, Trees and Tenure", held in Nairobi, May 1985.

Grandin B E and Lembuya P. 1987. *The 1984 drought: A case study from a Maasai group ranch in southeastern Kajiado District.* Pastoral Network Paper 23e, ODI, UK.

Great Britain. 1934. *Report of the Kenya Land Commission, September 1933.* His Majesty's Stationery Office, London.

Halderman J M. 1972. An analysis of continued semi-nomadism on the Kaputiei group ranches: Sociological and ecological factors. Discussion Paper 152. Institute for Development Studies, University of Nairobi.

Hedlund H G. 1971. The impact of group ranches on a pastoral society. Discussion Paper 100. Institute for Development Studies, University of Nairobi.

Herskovits M J. 1926. The cattle complex in East Africa. *Am. Anthropol.* 28: 230–272, 361–388, 494–528, 633–664.

Hunt D. 1984. *The impending crisis in Kenya: The case for land reform.* Gower Publishing Company, Aldershot, UK.

Huntingford G W B. 1953. *The southern Nilo-Hamites.* International African Institute, London.

ILCA. 1983. *Annual Report 1982.* ILCA, Addis Ababa.

Jacobs A H. 1965. The traditional political organization of the pastoral Maasai. Ph.D. thesis, Nuffield College, Oxford.

Jacobs A H. 1968. A chronology of the pastoral Maasai. *Hadith 1:* 10–31.

Jacobs A H. 1983. *An overview of population dynamics in Kenya's rangelands, 1969–1979.* Winrock International, USA.

Kenya, Republic of. 1986. *Economic management for renewed growth.* Sessional Paper 1 of 1986. Government Printer, Nairobi.

King J, Sayers A R, Peacock C P and Kontrohr E. 1984. Maasai herd and flock structure in relation to livestock wealth, climate and development. *Agric. Syst.* 13: 21–56.

Kjekshus H. 1977. *Ecology control and economic development in East African history: The case of Tanganyika, 1850–1950.* Heinemann, London.

Krummel J and Dritschilo W. 1977. Resource cost of animal protein production. *World Anim. Rev.* 21: 6–10.

de Leeuw P N, Bekure S and Grandin B E. 1984. Aspects of livestock productivity in Maasai group ranches in Kenya. *ILCA Bulletin* 19: 17–20. ILCA, Addis Ababa.

Lipton M. 1968. The theory of the optimising peasant. *Journal of Development Studies* 4(3).

Little P D.1983. From household to region: The marketing/production interface among the I1 Chamus of northern Kenya. Ph.D. thesis, Indiana University, Indiana.

Livingstone I. 1981. Rural development employment and income in Kenya. ILO/ JASPA, Addis Ababa.

Mair L. 1985. The cattle complex. *Man* 20(4): 743.

McDowell R E, Sisler D G, Schermerhom E C, Reed J D and Baver R P. 1983. Game or cattle for meat production on Kenya rangelands? International Agriculture Mimeo 101, Cornell University, Ithaca.

Njoka T J. 1979. Ecological and socio-cultural trends of Kaputiei group ranches in Kenya. Ph.D. thesis, University of California, Berkeley.

Ominde S H. 1984. *Population and development in Kenya.* Heinemann, Nairobi.

Raikes P L. 1981. *Livestock development and policy in East Africa.* Scandinavian Institute of African Studies, Uppsala.

Republic of Botswana. 1975. *National policy on tribal grazing land*. Government Paper 2. Government Printer, Gaborone.

de Ridder N and Wagenaar K T. 1984. A comparison between the productivity of traditional livestock systems and ranching in eastern Botswana. *ILCA Newsletter* 3(3). ILCA, Addis Ababa.

de Ridder N and Wagenaar K T. 1986. Energy and protein balances in traditional livestock systems and ranching in eastern Botswana. Agric. Syst. 20(1): 1–16.

Sandford S. 1976. *Pastoral human population*. Pastoral Network Paper 2c. ODI, London.

Sandford S. 1982. Pastoral strategies and desertiflcation: Opportunism and conservatism in drylands. In: B Spooner and H S Mann, *Desertification and development: Dryland ecology in social perspective*. Academic Press, London.

Sandford S. 1983*. Management of pastoral development in the Third World*. John Wiley and Sons, Chester, UK.

Sobania N W. 1979. Background history of the Mt. Kulal Region of Kenya. IPAL Technical Report A-2. UNESCO/UNEP, Kenya.

Sperling L. 1987. Food acquisition by the Samburu during the drought of 1983–1984. In: Drought in Kenya: Lessons from 1984. Natural Environment Secretariat, Nairobi. (Forthcoming).

Spooner B. 1982. Rethinking desertification: The social dimension. In: B Spooner and H S Mann, *Desertification and development: Dryland ecology in social perspective*. Academic Press, London.

Spooner B and Mann H S. 1982. *Desertification and development: Dryland ecology in social perspective*. Academic Press, London.

Strange L R N. 1980. *Human influences in Africa pastureland environments*. FAO Pasture and Fodder Crops Studies 8, FAO, Rome.

USAID (US Agency for International Development). 1980. The workshop on pastoralism and African livestock development. Program Evaluation Report 4. USAID, Washington, USA.