
Insecurity and Pastoral Development in the Sahel

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ABSTRACT

In this article it is argued that conventional agro-ecological and organizational concepts used in pastoral development are strongly biased towards the formulation and enforcement of norms. This leads development experts to attempts to control pastoralists and their herds. The policies and development interventions based on these assumptions have been largely unsuccessful. As a consequence attention for dryland areas and pastoral development has declined among researchers and development agencies. An important reason for this failure is the fundamental misfit between these normative concepts and the reality of dryland ecosystems and pastoral society. In order to show this, an alternative view on rangeland ecology and pastoral society is presented, supported by a case study of Fulbe pastoral society in dryland Central Mali. The authors argue that approaches to pastoral development must be revised in the direction of the dynamics inherent in the pastoral way of life.

INTRODUCTION

This article looks at the ways in which science and policy making are dealing with problems of survival and crisis in human societies. There seems to be a strong prejudice against the study of insecurity and crisis situations as phenomena in themselves; ethnographic as well as ecological and agronomic descriptions and analyses are strongly biased towards the selection of a standard situation as the norm for the cultural, social and agronomic undertakings of people. Current theorizing focuses on how people strive for a secure existence and try to avoid risks, whereas in reality most of their energy and creativity are invested in dealing with insecurity and responding to contingencies. In the event of a crisis, such as crop failure, drought or another subsistence failure, the ways in which people try to regain their natural state of being, and not the nature of the crisis itself, is put at the centre of the analysis. However, crisis situations are not just calamities for an unhappy minority, but rather a dominant feature of life for millions of people

The authors would like to express their gratitude to Franz von Benda-Beckmann, Wouter van Beek and Arie de Ruijter, and the anonymous reviewers for their extensive comments on earlier drafts of this article. An earlier version of the paper was presented at the VIIIth General Conference of the EADI, 'Globalisation, Competitiveness and Human Security: Challenges for Development Policy and Institutional Change', working group on Dryland Societies, Vienna (11–14 September 1996).

Development and Change Vol. 30 (1999), 115–139. © Institute of Social Studies 1999. Published by Blackwell Publishers Ltd, 108 Cowley Rd, Oxford OX4 1JF, UK.

in numerous societies throughout the world, especially in arid zones. For them insecurity is a total experience not confined to one life sphere or another, but integrated in their lives and society.

The same bias towards stability and normal situations can be found in policy making. Studies underlying policy interventions develop norms such as 'carrying capacity' and 'sustainability' for situations where instability and heavy fluctuations in living conditions and in availability of natural resources are daily reality. These norms are subsequently used in policy and development interventions, producing at best irrelevant and at worst damaging results for the survival strategies of the population in the short as well as the long term.

In this article we will view these development policies and interventions from the perspective of the persistent and all-encompassing insecurity which the population of dryland areas have to face in the struggle for survival. First, the basic concepts underlying livestock development and natural resource management policies will be discussed. An alternative view of pastoral production and society will then be presented, which will be elaborated by means of a case study highlighting the daily struggle for survival of pastoralists in the Sahel of Central Mali. In the discussion of this case study, insecurity will be used as a basic analytical tool. In the final section the misfit between the dynamics of survival in arid zones and policy-oriented concepts will be discussed and the methodological consequences for policy-oriented research as well as policy interventions will be sketched.

POLICY CONCEPTS IN LIVESTOCK DEVELOPMENT AND NATURAL RESOURCE MANAGEMENT

The debate on livestock development in the Sahel has long been dominated by terms like ecological degradation, sustainability, adaptation and carrying capacity. As long ago as the 1930s, scientists warned that the desert was advancing in West Africa. Grazing lands and ecological environments in the Sahel are said to become degraded as a result of overgrazing ensuing from overstocking (Lamprey, 1983; Mabbutt, 1985). Forest resources are depleted as a result of the uncontrolled cutting of fodder for animals and firewood (Catinot, 1984). The unbridled growth of livestock numbers in the colonial era, unclear tenure arrangements, incorporation in the modern economy, lack of control over encroachment of agricultural land into pastoral areas, inappropriate development interventions, and weak government were added to the list of causes for the problems in the semi-arid areas in the Sahel (Franke and Chasin, 1980; Grainger, 1990). Pastoralists are thus accused by some of irrationally adhering to unnecessary numbers of animals; others hold that they have become victims of the logic of population growth. Improved veterinary care and vaccination cover by livestock services led to a rapid growth of the number of animals, which was further promoted by the

opening of new pasture areas through the development of water resources, not only by colonial governments, but also by the African states and development agencies.

Land degradation in these views is the result of a shortage of land as a consequence of the growth of livestock numbers and the human population, in a situation where both are almost entirely dependent on natural resources (van Keulen and Breman, 1990: 12). This situation can only be remedied by investments in more intensive and appropriate land use techniques to reduce pressure on fragile pastoral areas (van Keulen and Breman, 1990). Reforestation should be undertaken and forests should be protected against high levels of exploitation (Catinot, 1984). The pressure of livestock should be adjusted to the carrying capacity of the range (Breman and de Ridder, 1991; IUCN, 1992). At governmental and international levels, development policy should be reformed and integrated with environmental planning (UNDP, 1991). Farmers (why not the herdsman?) should be given more security of land tenure, in order to promote investments in soil conservation (World Bank, 1987). All measures should be implemented within a sound ecological framework so that the human carrying capacity is not exceeded (Kessler, 1994: 274).¹

Since the problem in the livestock sector was considered to be one of inappropriate land use, most efforts were oriented towards the maintenance of the ecological equilibrium by the regulation of grazing pressure and the rational management of pastures. At the same time there was an attempt to enhance the performance of the livestock sector by improved breeds, the promotion of herd off-take, the development of infrastructure, and the encouragement of meat production, all through increased control over the numbers and movement of livestock (Hogg, 1988: 183).

Control of the target population is paramount for reaching these objectives. The participation of the intended beneficiaries is often presented as a means to improve the effectiveness of the development process (Oakley, 1987): those participatory organizations in which pastoralists undertake their 'own' development initiatives, supported by governmental development agencies, are seen as the most viable way to promote livestock development (Diop, 1989: 1; Douma et al., 1995; World Bank, 1987: 6). Development organizations, however, have their own agendas and dynamics. No development bureaucracy undertakes actions which might undermine its own power and threaten its survival (Quarles van Ufford, 1988b: 77). Participation in this perspective may also be a means to encapsulate the target population, so that control can be more effective. In this sense, participation may promote

1. Kessler (1994: 274) defines human carrying capacity as 'the maximum level of exploitation of a renewable resource, imposing limits on a specific type of land use that can be sustained within a given area without causing irreversible land degradation within a given area', to be expressed in sustainable population densities.

the proliferation of the state apparatus and may enhance control of the centre over the (semi-arid) periphery (Quarles van Ufford, 1988a: 17).

This bureaucratic, control-oriented attitude is very clear from policy documents for the planning of so-called pastoral associations. The way these organizations are supposed to function makes them effectively an extension of the governmental bureaucracy, more like work brigades than participatory organizations. The organization of participatory livestock development in Mali serves here as an illuminating example.

In Mali the Ministry for Natural Resources and Livestock-Keeping distinguished three levels for these pastoral associations. At the lowest level, voluntary groups of ten families each were to be established; these would be grouped together at the second level as a *cellule pastorale*. The third level consisted of several *cellules pastorales*, which formed the pastoral association, headed by a board (Shanmugaratnam et al., 1993: 20). This structure was to be supervised by the ODEM (*Opération pour le Développement de l'Élevage dans la région de Mopti*), the regional livestock service in the region of Mopti:

The board operates in close co-operation with the local representative of the livestock service, because the knowledge and the help of the latter may contribute to the group in the form of the preparation of programmes, the mobilization of external funding and the relations with external agencies. The ultimate goal is to create and maintain a spirit of commonality, enthusiasm, and to identify local development actions. The admission to the next phase is dependent on the evaluation of the local representative, whether he deems the degree of their understanding and participation sufficient. (Anon., 1989: 6, authors' translation)

Although it is acknowledged that improvement in natural resource management can only be attained with the help of the pastoralists, and at their pace (Sidibé, 1989: 1, 5), protocols for the delineation and subdivision of pastures were prepared in advance. Working protocols for the anticipated pastoral associations and western-style job descriptions and membership rules for the boards were also fixed in advance (Anon., 1989: 6–8; Sidibé, 1989: 4–5). It was hoped that in this way the pastoralists could be mentally prepared for change:

The moment is particularly opportune when looking at the fundamental transformations of this type of livestock keeping. It is now that we have to act. If we wait for several years, when they will have taken up their old habits and rebuilt their herds, it will be too late. (Sidibé, 1989: 4–5, authors' translation)

[In order to promote development . . .] there is still a lot to do for a complete change of their behaviour and mentality, and to reach the objective of making the livestock keepers take responsibility and effectively participate in development at grassroots level. (Anon., 1989: 3, authors' translation)

This attitude resulted in a top-down approach on the part of the local Malian administration. The regional livestock service (ODEM) continued to

function as a classic *encadrement*² extension agency. This entailed that 'technical components were carried out, "animation" and "sensibilisation" campaigns were executed to prod local populations to accept its programs and conditions' (Thomson et al., 1989: 87). The clientele was closely supervised to enforce contracts between the agency and the local organizations (van Dijk and de Bruijn, 1995).³ Many more examples of such practices certainly exist, given the remarkable similarity of policy initiatives for livestock development throughout the Sahel (see Douma et al., 1995).

There is thus a direct link between agro-ecological concepts and policy initiatives from the state level down to the individual herdsman. The question, of course, is whether this approach is a viable one given the situation of the population in dryland areas, and whether it is able to solve some of the problems these populations face. In technical terms the results of pastoral development projects have in general been very modest; in fact, most have been technical as well as social failures. This has led to a retreat of most donors from pastoral development and from dryland areas in general. This leads to a more fundamental question: were all these efforts, apart from being badly designed and implemented, hitting the right targets? In other words, did they address the relevant ecological and social variables?

AN ALTERNATIVE VIEW OF PASTORAL PRODUCTION AND SOCIETY

The New Range Land Ecology

However useful the conventional agro-ecological models that focus on (human) carrying capacity, sustainability, and homeostasis may be for a global assessment of long-term processes on a large geographical scale, they offer few analytical tools for the analysis of natural resource management at local level in highly variable environments. As one protagonist himself indicates, the smaller the spatio-temporal scale, the less reliable the models (Kessler, 1994). Uncertainties in the predictions of these models at this local level are tackled by devising 'probabilistic descriptions of variability'. This is done by the collection of more and more data and more and more variables assuming that more information will allow the prediction of outcomes at least in a probabilistic way (Scoones, 1995: 6).

This approach is aimed at predicting and controlling insecurity in pasture production rather than at understanding it. In the first place models are imperfect images of reality. They provide a framework for ranking the

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2. In the 'Petit Robert', *encadrement* is defined as: '*diriger, organiser pour le travail*', which is quite an accurate description of the way participatory development was organized in this area.
 3. Apparently this was done with little success, because after an evaluation in 1991 the funding of ODEM from foreign sources was stopped.

elements of a system, rather than elucidating the relations between these elements, for these are given by the model. By making a model, the complexity of reality is reduced to make it manageable. Therefore, the prescriptions for management of natural resources derived from the model may not concur with agro-ecological reality. This is also shown by the wide gap between predicted outcomes and empirical measurements (see, for an illustration, Diarra and Hiernaux, 1987).

A second problem is that land-users have to deal with total events rather than stochastic probabilities. They cannot prepare for a 60 per cent calamity, but have to anticipate the worst. Every crisis event in natural resource management is structured in a different way. The response of pastoralists and cultivators not only depends on agro-ecological indicators but also on the fluctuations of livestock and cereal markets resulting from these crisis events, and other contingent factors such as the incidence of pests, bush-fires, cattle diseases, and so on. They may also have to deal with all kind of legal and political constraints in coping with hazard. To date, it has been impossible to model these factors: consequently, rational responses are only rational in so far as they concern the variables present in the model.

Thirdly, critics of these models have also argued that the assumption of ecological equilibrium as the 'normal situation' conceals the dynamics of the ecosystems involved. A major source of ecological instability is the highly irregular rainfall pattern and associated drought periods. The unpredictable character of the ecological circumstances implies that semi-arid ecosystems operate far from equilibrium most of the time, even without human intervention (Behnke and Scoones, 1993). Dry land ecosystems may be controlled more by climatic events and sequences than by equilibrating interactions among the biotic components of the system (Ellis and Swift, 1988).

Although many local studies have indicated resource depletion in the form of a shift in or disappearance of the vegetation cover and consequent soil erosion, little attention has been given to the question of whether such depletion is permanent or temporary. For example, the species composition of Sahelian grazing lands is very dynamic, as species react differently to the variable rainfall conditions, depending on their germination strategy, water-use efficiency, capacity to withstand drought-stress and length of growth cycle (Bremen, 1994). Consequently species composition may change significantly from one year to another and back again, when rainfall recovers. It has also been noted that soils recover rapidly from degradation once the disturbing factors such as lack of rain cease (Geerling and de Bie, 1990; IUCN, 1992). Thus, degradation need not be irreversible and might be confused with instability.⁴ However, given the assumptions underlying agro-ecological

4. A recent assessment of desertification in Sudan indicated that there is no proof of the expansion of desertified areas (Helldén, 1991).

models, it is easier to conclude that degradation is occurring and to underrate the resilience of the ecosystems than to track instability.

Given the nature and extent of both temporal and spatial ecological instability it would be very hard to devise a norm, or a normal situation, against which to measure routine fluctuations in biomass production conditions and to find proof of the relation between resource degradation and indigenous management. With present levels of investment and current technologies for dry land management in the tropics, fluctuations in resource availability are unmanageable. In such unstable conditions it becomes questionable whether we can predict the relations between various human activities and the condition of the natural resources, and even whether it is possible to monitor or predict the effects of development interventions on the land use problems they are supposed to solve.

The Pastoral Way of Life and Insecurity

We therefore propose to focus on the pastoralists themselves. They have borne the brunt of drought, civil war, economic marginality, and development disasters over the past decades. Apparently those still leading a pastoral way of life have been able to deal with these conditions. Insecurity, crisis and hazard have been built into their cultural understandings and way of life in the course of history.

The accumulation of livestock and the adjustment of herd management to the harsh environments by moving the livestock from one place to another may be regarded as the central elements in the pastoral pursuit (see, for example, Dyson-Hudson and Dyson-Hudson, 1980; Khazanov, 1984). 'What is essential to pastoralism . . . is the *social appropriation* by persons or groups of successive generations of living animals' (Ingold, 1986: 133, italics in original). In order to establish the conditions for the appropriation of livestock the reproductive capacity of the animals must be controlled, they must be protected from natural hazards and their seizure by animal and human predatory competitors must be prevented (Ingold, 1980: 222). The management of more animals than are needed for the immediate survival of the pastoralists acts as an insurance against disaster (Horowitz, 1986), for the system of productive relations places the burden of the future on the herdsmen's own shoulders (Ingold, 1980: 134).

However, in contrast to natural conditions in which the pressure of predators tends to dampen herbivore-pasture oscillations, livestock numbers may be pushed beyond the limits of natural pasture production because of the protective measures effected by the pastoralists. Inevitably this will lead to some corrective disaster, a drought or an animal disease, in which a major part of the animal population will perish. So the precariousness of the pastoral enterprise, because of the unstable climatic conditions and the ensuing necessity for a high degree of mobility, is enhanced by the very

management decisions that enable humans to exploit animals (Ingold, 1980: 80).

This instability is exacerbated by the compelling need of the pastoralists to retain a link with non-pastoralist aspects of life. The vast majority of pastoralists do not subsist on livestock products alone: they may obtain cereals by the trading of livestock products for cereals, by the subjugation of cultivating populations or by the incorporation of cropping in their own way of life (Khazanov, 1984). Further they need to have political and military control over water and pasture. There is a host of evidence that the increasing incorporation of pastoralists into modern states in Africa negatively affects their control over resources, and that this leads to a progressive political, economic and cultural marginalization (Azarya, 1996; Markakis, 1993). This has led some to a redefinition of the pastoralist, living in a Hobbesian world of insecurity, war, famine, and drought (Baxter, 1993).

Reliance on the cropping of cereals to cushion the effects of production failures on the pastoral side of the economy has a negative impact on the mobility necessary for dealing with unpredictable ecological conditions. Moreover, cropping also increases ecological risk: by removing the natural vegetation and replacing it with the desired crop, the cultivator also introduces an element of instability into the agro-ecosystem. This is demonstrated by the need for technology and labour to make the crop grow and to protect it from hazards, and the need to periodically replenish the loss of nutrients in the soil. Roughly speaking, the more artificial the agro-ecosystem, the higher the instability and the greater the investments needed in technology and labour to compensate this instability, and to guarantee success in the form of a harvest.

In pastoral societies, insecurity is not limited to the ecosystem. Social inequality and insecurity have been, and remain, an important feature of pastoral societies (Baxter and Hogg, 1990; Iliffe, 1987). In West African pastoral societies non-stock-owning people formed a reservoir of cheap labour and clients (Iliffe, 1987: 65–8). East African pastoralists only incorporated some of the poor and obliged the remainder to seek refuge outside the pastoral economy (ibid: 68). As Sobania (1990: 2) wrote about the Eastern Lake Turkana region, ‘the notion of equality in these “egalitarian” societies was ideological’. Political hierarchies and even religious institutions have always provided ways to incorporate the poor and to legitimize their existence (Iliffe, 1987: 42–3). Status, political hierarchies and differential access to resources have a clear relation with the capacity of individuals and groups to deal with contingent calamities and crisis events. They define ‘risk positions’ for these individuals and groups (Beck, 1992) and determine to a large extent the scope and content of coping strategies.

People constantly have to respond in a creative manner to new circumstances. They do so within the framework of their own cultural understandings of reality (Croll and Parkin, 1992)—that is, the cultural means employed to counter insecurities of some sort, from those embedded in kinship, social

organization, legal institutions for resource distribution, knowledge and technologies, to social security arrangements, religion and ideologies. Solutions developed by development planners that do not take account of these cultural understandings will not be viable.

FULBE SOCIETY IN CENTRAL MALI⁵

The Research Area: The Hayre

The Hayre is an area in dryland Central Mali east of the Bandiagara plateau, consisting of the mountain range from the plateau to Mount Hombori and the adjacent flatlands south of the mountain range. Sedentary cultivators and semi-nomadic pastoralists populate the area. The political organization of the Fulbe in this zone is based on political hierarchies that were established under the Maasina empire in the nineteenth century. Within these hierarchies were occupational groups, political élites, Islamic clergy, craftsmen, tradesmen, the pastoralists on whom this paper focuses, and (former) slaves who cultivated cereals for the other strata of society. In these and subsequent political constellations, the pastoralists belonged both to the oppressors and the oppressed (de Bruijn and van Dijk, 1993, 1995), depending on the type of regime and their social position within Fulbe society. At the time of the fieldwork on which this article is based, they might best be characterized as cultivators, with generally low numbers of animals, and a high degree of sedentarity. Nevertheless, some of them owned large herds, and most engaged in transhumance, if only to look for employment in the herding of someone else's livestock.

Since 1968 the area has been struck by persistent drought and waves of ill fortune. During the 1980s the inhabitants had only one good harvest of millet, their main staple, in 1988. In the drought years 1983–5 as much as 75 per cent of their livestock perished. In the growing season before the fieldwork the whole harvest was destroyed by a plague of local grasshoppers; during the growing season of 1990, lack of rainfall was accompanied by numerous dust storms which destroyed the millet seedlings, and attacks by various pests, including termites, grasshoppers, beetles, elephants and birds. The resulting millet harvest was insufficient to feed the population. In addition, a rebellion of the Touareg started north of the Hayre, disrupting the trade which provided the markets in the region with cereals. The price of

5. This and subsequent sections are based on field research in Central Mali from March 1990 to March 1991 and from June 1991 to February 1992. The field research was part of a research project entitled 'Fulbe society in a changing world: Central Mali' which was funded by The Netherlands Foundation for the advancement of Tropical Research (WOTRO, grant W 52-494). Data used in this paper were gathered during this period by both authors.

millet rose (when it was available at all), while the price of livestock collapsed.

Clearly such climatic variability leads to enormous fluctuations in cereal production and forage resources for livestock production. Millet production varied between 13,000 and 42,000 tons in the Douentza district in the period 1975–86 (Hesse and Thera, 1987: 38). The shortages of cereals led to massive population movements in drought years, widespread famine and increased mortality due to weakness.

The data used in this article were gathered in a group of settlements of Fulbe pastoralists, called Serma, in the neighbourhood of a permanent settlement of their former slaves, labelled Riimaybe. The pastoralists make use of a variety of resources. They have their camps and millet fields on the border area between two agro-ecological zones, the tiger bush⁶ in the north and sand dunes in the south. During the rainy season they cultivate millet, the fields mostly being located on the sand dunes. The animals — cattle and some goats and sheep — are pastured in the surroundings. The sand dune area, or Seeno, provides excellent pasture during the dry season, but water supply limits its exploitation. In the dry season, after the harvest, most pastoralists go on transhumance in search of pasture and villages where they can barter milk for grains. Others graze their animals in the surroundings, corralling their animals on the fields at night for the manure they produce.

Agricultural Decision Making

As a result of climatic fluctuations the resource base in terms of food and pasture production also varies widely. Table 1 shows pasture production over the period 1984–9, when a major drought occurred. Before 1984, the area was probably overstocked in the sense that there was not sufficient forage available to feed the livestock population (de Bruijn and van Dijk, 1995: 286). According to conventional rangeland ecology this situation should have led to ecological degradation of the range, and thus to declining rangeland productivity. The data in Table 1, which apply to an area in the vicinity of the research village, indicate nothing of the sort, however. Biomass production oscillates almost randomly along with rainfall figures: variability in biomass production (40 per cent) is even higher than in rainfall (21 per cent).⁷ Another indication of ecological degradation would have been

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6. A dense bush on massive laterite or gravel to gravel–clay sandy soils, alternating with denuded areas. On aerial photographs this results in a tiger-skin pattern, leading to the name tiger bush, or *brousse tigrée* in French.
 7. Using a different method for calculating biomass production with the same data for this area, and for an area north of the research area, de Leeuw et al. (1993: 145) calculate variability in rainfall at 28 per cent and 37 per cent, and variability in biomass production at 64 per cent and 86 per cent respectively.

Table 1. Rainfall (P), Primary Production (PP) and Carrying Capacity (CC) of Pastures in the Research Area (1984–9)

Year	P (mm)	PP (kg)	CC in TLU/ha ¹
1984	196	347	0.048
1985	n.d.	1276	0.175
1986	198	983	0.135
1987	155	717	0.098
1988	284	1660	0.227
1989	225	1350	0.185
Mean	212	1055	0.145
CV ² (%)	20	41	41

Notes:

¹TLU = standard animal of 250 kg (1 camel = 1 TLU; 1 head of cattle = 0.7 TLU; 1 goat or sheep = 0.1 TLU).

²CV = coefficient of variance.

Sources: Diarra and Hiernaux (1987), Hiernaux et al. (1984, 1988, 1989, 1990).

changes in the species composition. High-quality perennial grasses indeed disappeared during the drought period. However, this cannot be taken as an indication as human- or livestock-induced degradation, because the grasses re-established themselves in the 1990s during years of exceptionally good rainfall (Douma et al., 1995).

In accordance with our model of the pastoral way of life, livestock numbers fluctuated wildly as a result of these instabilities during this period. Gallais (1975: 59) estimated the cattle population in the Douentza district at 300,000 head in 1970, plus another 100,000 head of cattle grazing in the area during the rainy season. Between 1967 and 1984 a 26 per cent decline was reported (IEMVT, 1988). After the drought of 1983–5 only 62,000 head of cattle remained, a loss of around 120,000 (RIM, 1987: 54, 66). These tendencies are confirmed by observations at local level. In a village neighbouring the fieldwork settlements, the herdsman lost 63 per cent of the cattle and 55 per cent of the small ruminants during the drought of 1968–73. In the post-drought years, 1973–7, the cattle population increased by 43 per cent (Diallo, 1977), proving that herd reconstitution can also be quite rapid. According to the herdsman in Serma, three quarters of their livestock were lost during the drought of 1983–5.

If we look at cereal production a similar pattern emerges. In Table 2 some harvest figures for various field types in Serma are summarized. Not only do production figures differ wildly from one year to another, but they also show remarkably high coefficients of variance (CV) between different cultivators at the same cultivation site. This indicates that there are numerous as yet unknown sources of production instabilities, some probably dependent on socio-economic characteristics, but also on the specific technical measures

Table 2. Productivity (*P*) and its Coefficient of Variance (*CV*) of Millet Fields at Different Cultivation Sites, 1990 and 1991

Location	Year	Productivity		
		P (kg/ha ⁻¹)	CV (%)	N
Tiile	pooled	341	74	32
Debere	pooled	381	49	9
Yaraama	pooled	377	45	7
Wiinde*	1991	656	57	5
Year	Location	P (kg/ha ⁻¹)	CV (%)	N
1990	all	305	80	25
1991	all	452	56	28
Mean		382	67	53

Notes:

N = number of observations.

*The *wiinde* (deserted campsite) was only cultivated in 1991.

and their timing by the cultivators, and some on mere chance (cf. de Steenhuijsen Piters, 1995).

One implication of this is that agricultural decision making cannot be analysed and conceived of as a planned and rational process. Rather it is a step-by-step procedure. In daily life agricultural decision making is characterized by day-to-day adjustments to all kinds of contingent ecological, social and economic factors. If we are to develop more viable solutions for problems of resource use and management it is important to accept this, and to focus on this variability and management of hazard, rather than basing development interventions on unfounded postulates with regard to agricultural decision-making strategies. A second implication is that, in order to understand the dynamics of resource use and management in pastoral societies, the analysis of the role of dynamic economic, political and social systems as important intervening variables is paramount. These variables co-determine to a large extent the impact of hazard on individual farmers and herdsman (cf. Henderson, 1987: 256) because they define 'risk positions' for the individuals or social groups involved (Beck, 1992).

Social Organization

Household and Hearthhold

This situation pre-supposes a specific type of social, economic and political organization. The organization of Fulbe society should enable people to deal

with variability and calamity. On the one hand it should provide people with sufficient flexibility, and a variety of options; on the other hand the organization of society should give individuals some measure of security in order to ensure that rights on production and reproduction are guaranteed. If not, society collapses.

A good example of the organization of flexibility is the way in which kinship relations are instrumental in organizing production and reproduction and the decentralization of decision making. In the literature, the Fulbe are depicted as being organized in patrilineages which are the backbone of social and political organization. Livestock keeping and cereal cultivation are primarily the responsibility of households made up of groups of agnates (a father with his sons, brothers), of which the eldest has ultimate decision-making authority over production. While this is in essence true, the dynamics of these production arrangements are in general badly understood.

In the Hayre in Central Mali household decision making is not the affair of the patriarch only. Herd management is in general under his decision-making authority, but the cattle of women who married into the household are often not subject to his management decisions; these women usually prefer to have their livestock managed by their own kin. There can also be conflicts between a father and his sons concerning the management of the herd. Since management and ownership of the cattle are separate, management decisions such as the sale of cattle in case of lack of food, often lead to conflict between the male members of the household. In order to prevent these conflicts, households may be subdivided into male-headed sub-units, which form their own consumption unit. In the case of brothers managing a joint herd, these brothers often form their own consumption unit. Consequently, management decisions concerning the off-take of livestock are decentralized, while daily management decisions are taken jointly. Sometimes this also leads to a temporary split-up of the household. If households are subdivided for specific purposes, cereal cultivation is often the affair of the sub-units (which is not surprising given the great variability in crop production). The Fulbe themselves claim that subdividing the household leads to higher production figures for cereals, because it does not permit free-riding on the labour of the junior members by the elder males who head the household.

However, decentralization of production and consumption decisions goes even further. As indicated above, women take their own decisions regarding their own livestock. They may also have considerable autonomy particularly with respect to their own tasks in the household, to the extent that they form their own sub-unit; this we labelled 'hearthhold', because it consists of the people who eat from the woman's cooking pot. The basic resource of the hearthhold is the milk, over which the woman has absolute authority. The processing, distribution and marketing of milk are the domain of women, and in this way the hearthhold is the unit where consumption is organized. Fulbe men have an obligation to supply their women with cereals. A practical result of this is that women often have free access to the granary of their

husband. In the case of a polygamous household, the women form independent hearthholds most of the time, taking their own decisions with respect to consumption, and the management of milk. In addition, the transfer of ownership rights on cattle by means of pre-inheritance is bundled within the confines of the hearthhold. Both father and mother allocate ownership of cattle to their children, whose milk rights have been allocated to the mother and her hearthhold. So it appears that livestock is (pre-) inherited by and redistributed over the members of the household in accordance with pastoral and Islamic prescriptions (van Dijk, 1994). However, the ownership of cattle and rights over the milk are also firmly entrenched at the level of the female-headed hearthholds (de Bruijn, 1997). This may explain, for example, the low incidence of polygamy among the Fulbe and the high amount of tension and conflict among co-wives, since they are competitors for the same resource, milk.

Kinship

The seemingly improvised character of the organization of production and consumption is reflected in the particular discourses that are used for denoting and discussing these social relations. These discourses concern kinship terminology and the ways kinship is used strategically to forge and maintain all kinds of social relationships that help people to deal with insecurity. Each individual distinguishes kin groups that are essential in his or her life: the *suudu yaaya*, or mother's house, and the *suudu baaba*, or father's house. In these groups are included all relatives of respectively one's mother and one's father. The boundaries of these groups are fairly fluid: depending on the situation, people may be included or excluded. Within these groups people are defined and named with the help of kinship terms. The kinship terminology makes a distinction between people from older and younger generations, and a difference is made between father's siblings and mother's siblings, cross-cousins and parallel cousins. However, for the Fulbe this is not very strict. The term *goggo*, for example, is not limited to the 'real' sisters of the father, but may be defined over several generations. In this way people who are in fact distant relatives can be defined as very close. It is thus possible to manipulate relationships to make them fit the idiom and its related social obligations.

This can be illustrated by the residential structure and the way this developed after the droughts. Residence in cattle camps is ideally based on kinship relations; members of one *suudu baaba*, especially, are expected to live together, although it is also desirable to live in the neighbourhood of members of one's *suudu yaaya* (for reasons which will be explained below). A reconstruction of the cattle camps of Serma in the 1960s, when life was more prosperous than today, shows that in those days larger groups of ('real') brothers, or other close relatives through the *suudu baaba*, lived together in a

camp. This was a pragmatic choice that also fitted the idiom or ideology of society. The group herded their animals together and shared the arduous tasks of watering the animals and cultivating the land. Another highly valued and frequently occurring relationship between people in a camp is between a man and his uncle from his mother's side.

Under the impact of the droughts, beginning in the early 1970s, these larger family groups broke up. As a consequence of the loss of cattle, many men migrated, and women returned to their mother's home or married distant relatives. The close family groups fell apart and what remains today are very fragmented groups of people (in kinship terms) living together in camps. The camps in which brothers still live together are in most cases the richer camps. Even here people no longer manage their herds together or pool their labour on the fields. Despite this people in these camps still refer to each other as brothers and sisters, or use other kinship terminology. Their relationship often spans several generations, but they behave towards each other like close relatives, and seem to value the fact that they can still define each other as an essential part of their intimate social sphere. Thus in times of scarcity the kinship structure does not disintegrate, but is manipulated in such a way that it fits both the conditions and the ideology.

Leadership at Community Level

An example of this flexibility is the structure of leadership. The traditional Fulbe chief, who resides in Booni, is the official headman of Serma. Serma is part of the former chiefdom of Booni; officially, it is not a village but a quarter of Booni. Nevertheless, the distance between Booni and Serma and the relatively little importance the chief himself attaches to Serma make his influence in daily life there fairly limited. In spite of this, the chief of Booni informally claims a position as chief of all the Fulbe of Booni and beyond — even over those Fulbe who live in Serma, but belong to another administrative unit. This claim is based on the historical role of his family and his renowned great-grandfather who was a famous warlord and established the chiefdom in the second half of the nineteenth century. Despite the fact that his role as 'traditional' chief has eroded under colonial and Malian rule, he has become very important — nowadays he forms the link between the inhabitants of Serma and the modern administration, and the development organizations, but this does not give him more 'traditional' credibility (see van Dijk and de Bruijn, 1995).

Another type of leadership in Fulbe society is the lineage elder. The Jallube pastoralists are divided into several lineages, of which one is dominant in Serma. This dominance is based on their number and their historical role in warfare. However, a long process of migration and dispersion of individual families has increased the geographical and social distance between the different sub-groups of the lineage, and this distance makes the influence of

the officially recognized lineage elder very limited. He does not live in Serma, but 40 km away to the southeast. Furthermore the dominance of one lineage is always temporary, because of migration and mobility of the groups. The dominance of one lineage in Serma has not resulted in leadership for one of them in the village: the representative of the lineage head in this case is merely a tax collector for the government or a counsellor to his superior. He has no influence beyond his personal capacities on decision making in the village.

Nor is there a distinguished leader at the level of the camp. A camp consists of several families, who group together, for a longer or shorter period, depending on the circumstances. These families may consist of just one family head (in most cases male) and his wives and children, or of a few brothers living together. All these small groups in the camp have their own business and do not necessarily organize events like migration or the cultivation of fields together. There is no dominant family in the camps. If the camp consists of one family only, the family head, the father and the oldest man, will have more authority than the others and can be said to be a leader of his own family group. However, this authority does not go very far: as soon as one of his sons disagrees with his father, he will separate himself from the camp and start an undertaking of his own in another camp, or even in the same camp.

The only leader we could distinguish during our stay was the Imam, who resided in the hamlet of the former slaves. Although his domain was religious, this gave him power in other domains as well because of the law of Islam and the charisma of this particular learned man. He commanded respect among the villagers and was given a leading role in the resolution of conflicts, in decisions concerning the organization of development projects, the extinction of bush fires, and so forth.

Some men, older and younger, have charisma because of their age or their personality; they may be attributed a leading role in some instances, but this is not expressed in an official function. These informal leaders are not in a position to impose their will on others. When leadership is required in specific cases, the villagers will rely on one or other of the people mentioned above, and ascribe them power on a temporary basis. Clearly, this diffuse structure of leadership allows the herdsmen to move freely and individually, whereas authoritarian leadership would restrict the flexibility that is so essential for the pastoral way of life.

Land Tenure

Land tenure provides another example of flexible responses to contingent insecure conditions. Present land tenure arrangements comprise a combination of customary, Islamic and modern elements. This framework is not only plural in a legal sense, but also in a spatial, historical and social sense. Different plural legal frameworks apply to different types of land, ranging

from private land for cereal cultivation as a commodity, to land under lineage control around wells, to 'open access' type of resources such as pastures. These land tenure arrangements have evolved over the past fifty years from an extensive bush-fallow system with land under lineage control, to more intensive land use systems based on more privatized rights of access to land. This development was stimulated by two decades of good rainfall, which allowed the intensification of cereal cropping. Another innovation during this period was the cultivation of abandoned campsites (*wiinde*, pl. *biile*), where the soil contained plenty of manure. These campsites were cultivated for two to three years, after which a new site was taken into production. In this way cereal cultivation moved around the village territory (van Dijk, 1996).

During the drought these intensive land use systems fell into disuse. Crops 'burned' on sites that were heavily manured. Other plots declined in productivity as their owners lost their cattle during the droughts and could not maintain soil fertility in an appropriate manner. Campsites were no longer cultivated on a regular basis. During the 1990s, ancient claims on lineage land were revived to allow for a more extensive and drought-adapted cropping system, based on the use of camel traction for cultivation as a labour-saving device. Cropping expanded with the result that campsites had to be moved in order to avoid conflicts over damage to crops in the neighbourhood of campsites. In such periods of change, the rules of the game shift constantly, and the actors involved resort to different legal systems for justifying their claims and fighting conflicts.

Traditionally access to pastures was linked to control over dry season water resources. When surface water was available during the rainy season (July–September) access to pastures was free. Up to 1978 all water resources in the territory of Serma were either owned by individuals (underground water reservoirs) or were lineage property (pastoral wells), so that outsiders could not make use of the pastures once surface water was exhausted. In 1978 a motor pump was installed on a borehole in the sand dune area south of the group of settlements. A pasture area was closed off as a dry season reserve under the management of a pastoral association, and access to this enclosure was limited in accordance with carrying capacity. Those who wanted to make use of the area had to pay fees for watering their animals. As a result a former common grazing area for all the herdsmen in the village became the pasture area for a privileged, wealthy minority with political influence (see van Dijk and de Bruijn, 1995). In 1987 a water hole just north of Serma was deepened, allowing herds to stay in the area up to December. This led to an enormous influx of herds from neighbouring villages and even from the Inner Delta of the Niger, depleting the pastures of the local herdsmen. During the rainy season of 1997 there was an increase in conflicts between local and foreign herdsmen. In December 1997 there were still so many herds of cattle in the area that the pastures were almost totally depleted, with the rains still six months away.

Land tenure arrangements and the spatial allocation of land and use rights are mainly an expression of how people solved problems and regulated access to resources in the past. The dynamics that we observe today have to be placed within the frame of the present power structure and daily concerns for survival. The allocation of land is thus emerging out of the decisions, negotiations and conflicts of individuals and groups, who try to contend with political change, ecological hazard and the need for flexibility (van Dijk, 1996: 40).

Social Security

Clearly, there is great diversity in decision-making arrangements. Different production and consumption spheres may be organized at various levels of the household, viz. hearthhold. This high degree of flexibility is not incompatible with the fact that the household and the marriage which forms the *raison d'être* of the hearthhold are very temporary units. Marriage instability is very high, leading to the break-up of hearthholds and sometimes even of households. In the course of our fieldwork, several larger households decided to split up, or to re-arrange decision making in such a way that their nature was fundamentally altered. Among the reasons for this instability is the way in which social security relations are organized.

All these aspects of social organization are in fact defined from the perspective of the individual. The people within an individual's orbit are denoted with *yimbe am* or my people. Kinship, residence and leadership are ways of recruiting people for one's own purposes, but given the enormous flexibility observed, one cannot count too much on social ties beyond the confines of the household, and even the hearthhold. Dupire (1970: 32) explains the relative absence of gifts and ceremony in Fulbe society as follows:

This way of relating does not link individuals and groups in a continuous and inexorable manner, like a system of debts and mutual obligations, which is the practice in other societies. It is adapted to a nomadic way of life, where economic insecurity and residential instability form a problem for all. The recovery of debts would be a futile undertaking and bound to fail in such conditions. (Authors' translation)

According to Platteau (1991) such a situation may result from the fact that ecological risk is highly co-varied, because of the relatively homogeneous ecological environment.⁸ In this instance an organization in small kin groups with few bonds is the most rational way of protecting oneself.

8. One might also say that they have been contained within this ecological environment by the political structure of which they formed the upper stratum during the pre-colonial and colonial period, so that their mobility was reduced to the extent that it incurred costs on the ecological side.

Islam often plays a role in providing some social security to the poor and destitute, by means of institutions like *zakat* (income tax) and *sadaqa* (alms giving). However, when the general standard of living is low or depressed, such as during crisis situations, the role of these institutions is limited. Moreover, the *zakat* tends to replace all kinds of kinship-based solidarity (de Bruijn, 1994: 51–6). As a last resort people leave their home area and end up as paupers depending on food aid or the charity of other ethnic groups (see de Bruijn et al., 1997)

At present the reproduction of society is only taking place within the confines of the hearthhold, in the sense that there all kinds of help and care relations are maintained. The links that are formed between a mother and her children, and siblings from the same mother are the only ones that last for life. Half-siblings born from co-wives are competitors for the animals from the family herd, just as their mothers are competitors for the milk from that herd. The relations between the members of a hearthhold are symbolized by milk. The hearthhold is essentially a milk-sharing unit; they drink first from the same breast (of their mother), and then live from the same fraction of the family herd. Although the hearthhold often breaks up due to the divorce of the man and woman, and although the children nominally belong to the patri-lineage of their father, the ties forged in the hearthhold often remain the most important for an individual.

The relations of care derived from the household are by extension attributed to the mother and her family, the *suudu yaaya*. The *suudu yaaya* is associated with care, whereas the *suudu baaba* is associated with power, and force. For a woman, the relations with her *suudu yaaya* remain very important throughout her life, until she gets old and her (male) children take care of her. In fact she can always return to her own kin, especially her brothers, with whom she shared the same hearthhold. This gives her a considerable amount of autonomy *vis-à-vis* her husband and is one factor in the high frequency of divorce.⁹ This is also reflected in the marriage gifts, which only serve to establish a new hearthhold, as all is invested in the ‘house’ of the woman, and becomes her property, which she can take with her at divorce (de Bruijn, 1997). In this way no long-standing relationships are endangered in case the marriage is dissolved.

DISCUSSION

Insecurity is thus a dominant theme in the ways in which the Fulbe of the Hayre organize their lives. Pastoralists have to confront rapidly changing

9. Out of a sample of thirty-two women, only six were living with their first husband. The others had divorced between one and seven times. In a sample of eighteen men, all had married more than once (which does not always mean divorce from their first partner because of polygamy), and some up to seven times (de Bruijn, 1997).

ecological, economic and political conditions, both in space and time, which often result in hazards for the people involved. These insecurities find their way into all kind of cultural expressions, leading to a form of social and political organization which is extremely flexible and changes rapidly in response to all kinds of contingent environmental and contextual factors. Basic to this social and political organization are small-scale units, such as the hearthhold, family groups, camps. It seems that operating in small kin groups is the most rational way of finding one's way under these high-risk conditions. Under the impact of the persistent droughts of the 1970s and 1980s, pressure on larger groups was so extreme that social organization crumbled. Social care relations have become increasingly limited and have in fact become confined to relations of solidarity present in or established over time in the hearthhold. This means that extreme caution should be exercised in imposing any kind of ecological measures, which may further imperil an already precarious mode of existence.

This contrasts sharply with the image of pastoral society and the organizational principles of pastoral development which are maintained by international donors, national development bureaucracies, and maybe even non-governmental organizations. The mechanical, bureaucratic and even authoritarian manner of organizing (pastoral) development is at odds with both the social and ecological reality of pastoralists. Thus, as well as guarding the effectiveness of the organization and the technical soundness of pastoral development itself, as practised up to now, the problem of compatibility of the bureaucratic dynamics of pastoral development with the extremely variable dryland ecology and the flexibility of pastoral society must also be faced.

Organizations dealing with pastoral development, like the underlying agro-ecological disciplines, are oriented towards the control of agro-ecosystems and the people operating them. Interventions are based on a number of postulated relations between specific forms of use and management of natural resources and the social organization of pastoralists and their consequences on ecological conditions. Agronomy and rangeland ecology are oriented towards the control of the ecological parameters indicating these conditions. Once this control has been achieved, production can be improved by manipulating the technical parameters and applying more rational management according to the indicators that have been developed to monitor this production process. This coincides with bureaucratic concerns with controlling environmental degradation and unruly pastoralists using natural resources.

However, the technical means do not fit the ecological reality. Technicians and engineers are not able to effectively control the conditions for production. The measures they propose, the regulation of grazing by controlling access of livestock to grazing blocks, only serve to benefit the rich, while excluding the poor in Central Mali (see van Dijk and de Bruijn, 1995). Moreover, these measures are socially and ecologically unsound, because the imposition of limitations on herd movements enhances the risk of disaster, as

livestock get trapped in places where pastures are absent. The ecological benefits of controlling access to grazing have never been proven in a convincing manner.

Pastoralists recognize their inability to manipulate the ecological environment, and do not try to control it. Rather they follow an opportunistic strategy (Sandford, 1983), by exploiting a variety of resources and a high degree of mobility. Their ways of decision making are not based on the rational weighing of alternatives against a maximized utility or minimized risk scale. Instead, they make sequential adjustments on a day-to-day basis. Their social organization in terms of kinship, leadership, land tenure arrangements and the organization of house, hearth and reproduction is such that people retain the maximum freedom of choice for pursuing those strategies they perceive as the best. They develop new strategies by the compounded effects of such daily adjustments. Assumptions with respect to the systematic or structural characteristics of social and cultural institutions have to be abandoned: what we observe is but a moment in a sequence of constantly changing situations. All the changes, calamities and problems which development policy should be addressing in pastoral societies are acted out in contexts that are time- and space-bounded (cf. von Benda-Beckmann, 1992). To further the development of policy, we should focus on process rather than structure, in order to uncover the dynamics, the transformation rules, behind the reality of day-to-day survival in semi-arid areas. No solution can ever be valid without reference to contingent ecological, political and economic conditions.

The basis for the organization of pastoral associations as conceptualized by aid donors and governments has no ground in the social reality of pastoral society. The *cellules pastorales* composed of voluntary groups of ten families in Fulbe society in Central Mali are by definition temporary and are thus unfit as building blocks for pastoral development, especially if they are intended to govern all aspects of life. They may not even last a year. Central control over agricultural decision making by the board of a pastoral association is unworkable, because no man or woman in a pastoral society can take these decisions for the others. The conditions are so diverse and the options available for individuals depend so much on his or her risk position that central control limits flexibility and undermines the viability of the pastoral way of life.

What is needed is an approach to pastoral development which is based on a thorough understanding of the dynamic interplay between the insecure conditions under which pastoralism is practised, herdsmen's decision making and their (cultural) understandings of their ecological environment and own society. This means that current methodologies have to be reassessed, and policy formulations have to be redirected towards an appreciation of instability, variability, and diversity, rather than the narrow focus on norms and indicators for control. Scientific research should be oriented towards a thorough understanding of the processes and dynamics of agricultural

production in relation to the organization of consumption and reproduction in pastoral society at various levels, from individual and hearthhold to household, village, region, ethnic group, and so on. Development policies should leave behind attempts to control pastoralists, and move instead towards the creation of institutional and economic conditions which allow pastoralists to protect themselves from the impact of ecological hazards and market fluctuations. For this they should be given more legal and managerial control over the resources they need to pursue their way of life.

Apart from natural resource management, this means that — at best — we may hope to organize pastoralists for very clearly defined goals, with a very loose form of organization covering only limited aspects of life, based on their individual interest, and on a temporary basis. Only in this way can more general objectives like the improvement of pastoral production and socio-economic development come within reach.

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