Food Shortages and Seasonality in WoDaaBe Communities in Niger

Cynthia White

Introduction

This article deals with a Fulani group, the WoDaaBe, in central Niger and is based on fieldwork done between September 1979 and April 1983.[1]

The WoDaaBe live in a part of the Sahel with low annual rainfall (200-300mm) and high absolute and relative seasonality. Rainfall distribution is extremely variable in time and space. There are four main seasons: a cold dry season (November to January), a hot dry season (February to April), a transition season as erratic rainfall begins (May to July), and a hot rainy season (August to October).

The WoDaaBe do not cultivate. They raise cattle primarily and have some sheep and goats. Donkeys and male camels are used for transport of baggage and people. The WoDaaBe live in rudimentary camps, which they move frequently in search of pasture and water for the animals. In the dry season they use permanent deep wells for watering the herds, or shallow wells that are re-dug by hand each year. At this time of year, camps are moved every few weeks.

In the rainy season however, the WoDaaBe move every few days as rainfall moves north and they try to keep up with a northward advancing front of high quality green grass. The spatial distribution of rainfall, and hence pasture, is scattered and unpredictable. Animals can drink at surface water pools at this time.

Production is organised at the household level. Herds are managed by individual households and labour comes from within the household. There is no dependent class.

Seasonal Work Patterns

Pasturing and watering are the two most time-consuming tasks in WoDaaBe herd management, although there are many other less demanding jobs to be done. Figure 1 shows how the total labour allocation of adult WoDaaBe men to livestock tasks stays high and quite constant throughout the year, varying around 5 hours per adult man a day; there is a peak of 6.5 to 7 man hours a day in the transition period between the hot season and the rains, between May and July in both survey years, and a low point of about 3.5 man hours a day in the immediate post-rains period in October. The dry season is a time of prolonged high work hours. Adult men rarely work less than five hours a day at herding from December until the rains are well under way in the following July. Pasturing and watering alternate with each other as the main activity, with the emphasis shifting from one to the other according to the season; watering is clearly much more energy-demanding than pasturing however, and is at its peak at a time when food is often scarce in WoDaaBe camps. Pasturing work, while less arduous, nevertheless requires a continuous presence and considerable skill and knowledge.

An interesting point is the peak in livestock work at the start of the rains. This is a critical time for the health and long term well-being of the animals. The WoDaaBe supervise them carefully to make sure that they graze the proper mixture of different vegetation

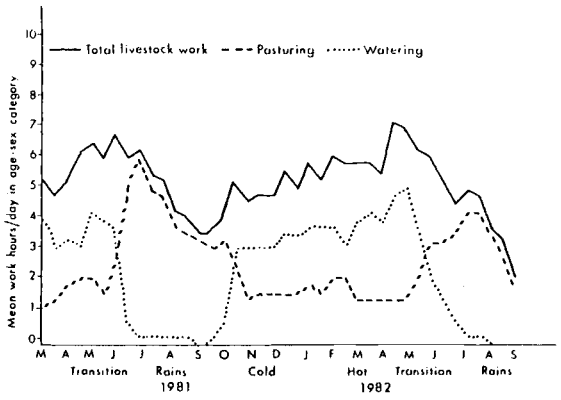
[1] Quantitative data on labour use and household budgets were collected from November 1980 to September 1982 on a sample of 19 families forming 16 production units. The small size of the sample was imposed by the difficulties involved in collecting accurate longitudinal data amongst extremely mobile and scattered households at long distances from each other, and was compensated for by the collection of less detailed data and qualitative work done on a much wider range of WoDaaBe groups in different parts of Niger's pastoral zone.

The detailed quantitative data were collected twice weekly by four WoDaaBe field assistants. Because there are no WoDaaBe who have been to school, the assistants recorded data in tifinar, the phonetic script used by the Twareg (the other nomadic pastoral group in the area) and were taught to write numbers. Each member of each household was asked about all of his/her activities during the preceding three or four days. Everything entering or leaving the household through sale, purchase, loan, barter or gift was recorded, including prices, quantities, age and condition of animals, and the market used. In the camps I went over each of the data sheets with the enumerators, clarifying questions, and cross-checked information by observation and discussions. Full research results are written up by White in Swift (ed) 1984:292-430; 462-529.

IDS Bulletin. 1986, vol 17 no 3, Institute of Development Studies, Sussex

Figure 1

Seasonal distribution of work devoted to all livestock tasks by WoDaaBe men aged 15 to 40 years



types and pasture areas to ensure rapid recovery from the dry season. This is crucial for the animals to get the maximum benefit from the short wet season green pasture. The transition season is also a time when some plant species are at a toxic stage of the vegetative cycle. Animals must be watched carefully as whole herds have been known to be wiped out by bloat when they have grazed toxic growth.

The peaking of most cattle calving just before or in the early rains means that there is more work then looking after the young calves at their most vulnerable moment.

Women help men with pasturing and watering and have other regular tasks, such as milking and moving camp, which continue throughout the year. Milking labour drops off in the dry season when the animals are producing little milk. Striking and pitching camp peak in the rainy season when camps are moving most frequently. Women's main labour activities however are pounding and cooking cereals and fetching domestic water (Figure 2). Both are most time-consuming in the dry season.

Camps are up to 20 km from the wells in the dry season and women spend long hours collecting water and helping with watering. At the height of the dry season they do not return to their camps from the wells until the evening when they have to pound cereals and cook. Because animals' milk production decreases as the dry season progresses, households must use greater quantities of cereals at this time.

Children make an important labour contribution, particularly in the transition and dry seasons (Figure 3). Boys spend most of their time watering throughout the dry season. Average person hours spent per day watering animals in the dry season was even higher in the 6-14 year age group than for adult men. Girls help with a wider variety of tasks, in particular fetching domestic water, which drops in the wet season and rises in the dry season.

Figure 2

Seasonal distribution of domestic labour by WoDaaBe women aged 15-40 years

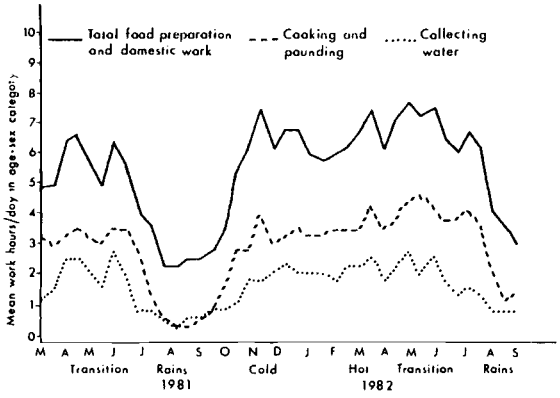
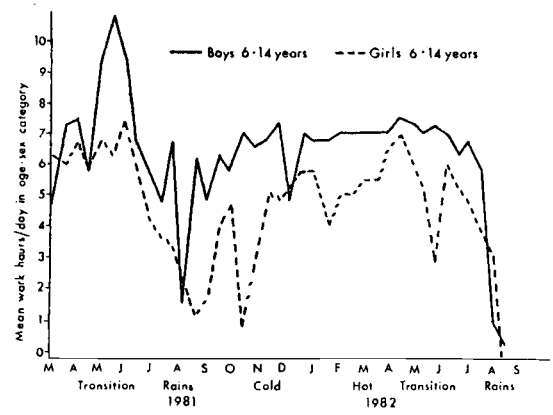


Figure 3

Seasonal distribution of time spent by WoDaaBe children on all productive tasks



Although labour inputs are quite high throughout the year, dry season labour is far more arduous. Well digging and cleaning, watering animals and walking long distances to wells in extreme heat contribute to stress at a time when both food and water are scarce. Drawing water from wells and lifting it to watering troughs is back-breaking work. In terms of energy

Table 1

Milk available to WoDaaBe households in different seasons

	August 1980 (rains)	*November 1980 (cold)*	*February 1981 (hot)*	*May 1981 (transition)*	*September 1981 (rains)*
Milk production (litres/lactating cow)	2.35	1.35	0.64	0	n.a.
Milk consumption (litres/person)	n.a.	1.37	0.66	0.37	2.43

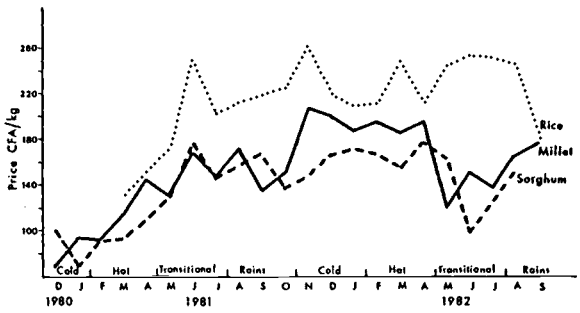
requirements, it cannot be compared to wet season pasturing labour, which, although time-consuming, requires more knowledge than strength.

Dry Season Food Supplies: Cattle Sales and Cereal Prices

High dry season labour demands coincide with household food shortages. As the grass dries out after the end of the rainy season, its protein content and nutritional quality decline. Grass is most scarce around water points and this, combined with the long distances most animals must walk to wells, reduces milk production (Table 1). Households must increasingly supplement their diets with cereals as the dry season progresses. Cereal prices, however, are rising at this time (Figure 4).

Figure 4

Mean monthly cereal prices paid by WoDaaBe sample households



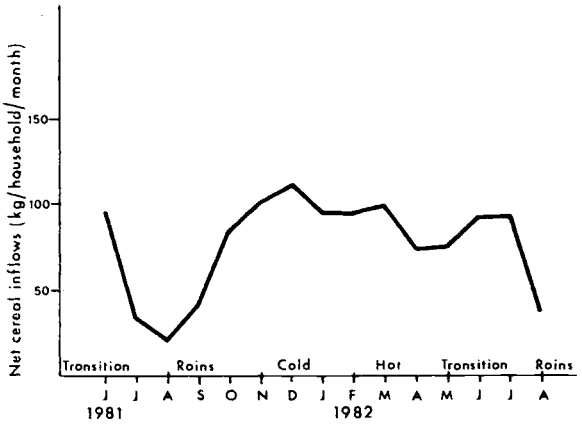
The WoDaaBe's only source of cash with which to buy cereals is the sale of their animals, which are in particularly poor condition in the dry season and fetch low prices in the market. Poor families with small herds and therefore inadequate milk supplies are most dependent on dry season sales of animals in poor condition in order to buy expensive cereals. Figure 5 shows that dependence on cereals rises steeply in the dry season.

An analysis of all cattle sales in a sample of 14 WoDaaBe households over a period of just under two years (from November 1980 to September 1982) indicates that sales of very young males and reproductive females were occuring, with a peak in sales in the dry hot season. Calf mortality is high in the first year and drops substantially thereafter. The value of animals, particularly males, rises sharply with rapid weight increases over the first few years of their life and reaches a maximum at about five years for males. Because of the low marginal cost of herding additional animals, and the absence of economic cost to the herder for the use of grazing land, it is clearly in the herder's interest to hold onto young male animals until they have achieved a substantial part at least of their maximum value. As females provide milk and the future reproduction of the herd, any sales of productive females before they approach the end of their reproductive years seriously jeopardises the continued production of the herd.

Table 2 compares a computer simulation of the optimal age/sex distribution of sales with actual sales in 1981-82, and shows that a high percentage of males are being sold before they are five years old. Even more serious is the large number of sales of reproductive females (26 per cent of all cattle sales). This pattern of sales is the clearest indicator of a downward spiral of poverty, in which household herds are too small to provide for household consumption. Inadequate milk supplies mean a greater dependence on cereals. The needs to obtain cash to buy cereals necessitates further animal sales. Once old females and adult males have been sold, increasingly young males must be sold to meet cash needs. Herders are then not only losing the potential economic benefit of the

Figure 5

Net monthly cereal inflows to WoDaaBe households



animals' weight gain, but, also, a larger number of young animals must be sold to buy the same amount of cereals. When the sale of young females begins, the milk supplies of the household herd are further reduced, and the vicious circle is completed.

The dry and transition seasons are crucial to this process. Milk supplies are lowest in the dry season, and the need for cereals is highest at this time. Cereal prices are high and the condition of animals is poor, so a larger number must be sold to obtain the necessary cash to buy cereals. If household cereal requirements can be reduced in the dry season, allowing a few more animals to be held in the herd until the following rainy season when their condition improves considerably and they have grown a lot more, there is an important saving, both in terms of numbers of animals and value per animal.

The only way the WoDaaBe have of reducing dry season cereal consumption is to send household members away at this time on migrant labour. Increasing numbers of WoDaaBe are leaving their camps in the dry season to go to Nigeria and other countries, where men work as watchmen or sell traditional medicines and women earn money braiding hair or mending calabashes. Prostitution is not mentioned openly, but there is some evidence that it takes place when women are well away from their communities.

Detailed household budget studies show that the WoDaaBe were not able to earn enough money to return to the camps with savings. They could barely cover their subsistence costs while they were away and sometimes contracted debts for transportation. Their absence however reduces cereal requirements in the camp, and reduces the need to sell animals in the dry season. In the sample households, average direct savings attributable to cereal consumption foregone as a result of the absence of migrant labourers were equivalent to the value of a one or two year old male or female calf. But as the labour graphs show, the dry season is the time of peak labour demands, and the absence of migrants aggravates dry season stress on the household members who stay behind.

Anthropometric data collected by Louis Loutan on 54 WoDaaBe families between August 1980 and September 1981 (a sample that overlapped with my own) show the effects of this dry season stress

Table 2

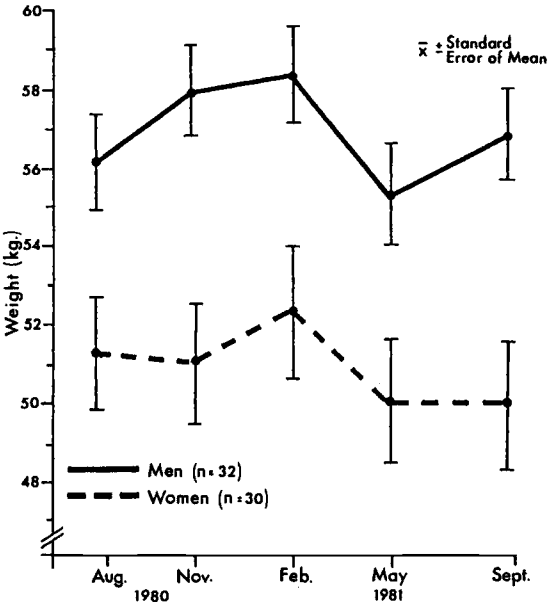
Age-sex structure of cattle sold by WoDaaBe sample compared to optimal sales from simulation

Males			*Females*		
age (years)	*optimal sales (%)*	*sample sales (%)*	*age (years)*	*optimal sales (%)*	*sample sales (%)*
<3	18	32	<4	—	19
3-5	27	9	4-9	—	7
>5	12	11	>9	43	22
	57	52		43	48
(n)		(65)			(59)

(Figure 6). Between February and May 1981, the mean weight loss was 5.3 per cent of body weight for men, and 4.6 per cent for women. Of the sample of 55 men, three lost 14 per cent of their body weight. Although women lose less weight than men, they recuperate less rapidly during the rainy season [Loutan and Lamotte 1984:946].

Figure 6

Seasonal changes in the mean weight of adult WoDaaBe men and women



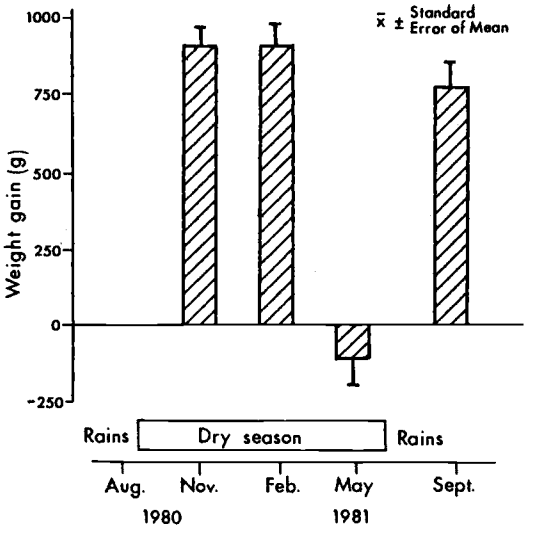
A more sensitive measure of the fluctuations in nutritional status during the year is obtained by calculating the gains in weight of children between one and five years at intervals of three months (Figure 7). The sample's average yearly gain of 2.4 kg is comparable to standard values, but the measurements again point to the dry season as a time of stress, when under fives not only stop gaining weight, but actually suffer weight loss [Loutan and Lamotte 1984].

Data from the same survey show that there was no significant seasonal variation in the overall number of diseases. However the rate of incapacitation due to illness did vary across the year. As Figure 8 shows, the rate of incapacitation peaked in the dry season when 45 per cent of people of work age (12 years and older) were confined to bed at least once [Loutan 1982:84]. Because of full labour force participation and the year round necessity of constant herd surveillance to avoid animal loss, any incapacitating disease will have an important impact on a household's independence and productive capacity. This is especially true in the dry season.

All of these factors demonstrate that, in contrast to agricultural societies, it is the dry season and the transition between the dry and rainy seasons that is the most difficult time of year for WoDaaBe pastoralists. It is important to note that although labour demands drop slightly in the short rainy season, they remain quite high throughout the year for all age and sex categories. There is no real slack season when alternative work can be done outside the pastoral economy without affecting pastoral productivity.

Figure 7

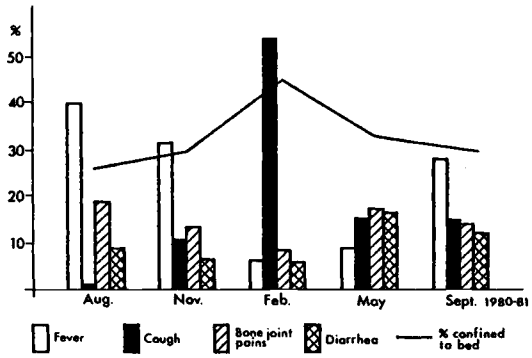
Weight gain in 32 WoDaaBe children ages 1 to 5 years by trimester



But this is only part of the picture. Seasonality, through a coincidence of stress factors in the dry and transitions seasons, clearly does reinforce poverty among the WoDaaBe. It is in the dry season that they are obliged to break into their capital case, directly reducing future food availability and productive capacity. it is important to note that in fully pastoral societies, the loss of the reproductive elements of the herd through either sales or death, not only diminishes short term food availability (milk) but also reduces long term food sources as well as the reproduction of assets essential to production. Animal loss beyond the threshold at which the herd can reproduce itself is equivalent to the sale of land for agriculturalists. It has an irreversible effect on production, and recovery requires substantial capital inputs to which the WoDaaBe do not have access.

Figure 8

Seasonal variation in the prevalence of the four commonest illnesses among the WoDaaBe (per cent of illness events in preceding 3 months)



Seasonality and Poverty

Although seasonal stress is crucial, its impact does not in itself create the downward spiral of sales of very young males and reproductive females. Dry season food shortages requiring many animal sales are not environmentally determined. They are in fact a recent phenomenon. Dupire's work on the WoDaaBe of the same area in the 1950s and 1960s [Dupire 1962a, 1962b, 1962c] demonstrates that household herds were sufficient for year round subsistence. In the dry season, reduced milk yields per animal were better offset by a larger number of animals per household herd. There was more milk both for consumption and to obtain cereals through barter. Even non-breeding animals were sold rarely, and primarily to obtain cash for taxes.

However, the WoDaaBe suffered important losses of animals in the drought of the early 1970s, and since 1974 households have not been able to reconstitute herds that are viable for year round subsistence. They are now obliged to resort to migrant labour or herding animals belonging to outside investors as stop-gap measures in order to survive. Neither of these strategies, however, permit herd reconstitution. Salaries from migrant labour barely cover the subsistence of the migrants themselves and cannot contribute to that of the rest of the family left behind, much less provide money for animal purchases.

Neither is the herding of animals belonging to non-pastoralists a solution for the WoDaaBe. Traditionally, compensation for this labour was paid in animals and gradually permitted poor families to obtain a herd. Now the WoDaabe get nothing from the owners but the milk of the animals they are tending. However, investors tend to have a large proportion of males for their greater commercial value. Because there are now so many poor WoDaaBe looking for animals to herd, they can no longer negotiate the terms on which this work is done. Although the herder gets some milk for his labour, he still has to rely on sales from his own inadequate herd for cash. Furthermore, small herds and consequent migrant labour and herding outsiders' animals make it difficult for the WoDaaBe to use the full range of their normal risk aversion strategies (such as mobility, herd splitting, animal loans, the use of traditional rather than public diesel pump wells).

Labour shortages caused by food shortages impose detrimental labour short-cuts. And there is clear evidence that keeping animals as a supplementary investment, rather than for subsistence, and having them herded by people who do not own them, results in harmful herd management practices and resource use, reduced overall productivity of the national herd, and increasing poverty among pastoralists [White 1984:512-18].

Large-scale animal loss also affects the redistributive system that counters seasonal food shortages. Households with temporary milk shortages are loaned milk cows for a season by others with adequate milk supplies. Other forms of animal loans, especially the loan of a female until she has produced three calves which then belong to the borrower, help households that have lost animals through disease or other misfortune to rebuild a minimum herd. There is a strong obligation for richer households to provide animals for poorer, and for the group not to allow an individual household's herd to fall below subsistence level. However, this system of collective security can only operate if the group's total animal resources are sufficient.

A particularly bad drought year has therefore created the conditions in which annual dry seasons are now surmounted only with great difficulty. But once again this is only a partial picture. There have always been times of substantial animal loss in the Sahel through drought or disease. Large-scale irreversible animal loss is no more environmentally determined than annual food shortages. The long term evolution of political and economic conditions is such that the WoDaaBe are marginal to the political process in Niger. In this they are similar to nomadic pastoral peoples in other parts of the world.

Many factors have contributed to make the WoDaaBe economy more vulnerable: the colonial conquest, the imposition of cash taxes, an increased dependence on the market, and the greater political weight of agriculturalists. Important to this process has been the expansion of areas cultivated by farmers. The extension of agriculture was initially a response to

pressure to produce cash crops through the imposition of cash taxes by colonial governments, and continued as increased cash needs, reduced soil fertility, abandoning fallow, land sales, and population pressure pushed agriculturalists north into increasingly marginal areas beyond the normal ecological limit to rainfed cultivation [Watts 1983]. This northward movement of agriculture reduced pastoralists' precious dry season forage reserves and drought fall-back zones, making pastoralism more vulnerable to drought.

Before 1974 the WoDaaBe were able to recover from large-scale animal losses by resorting to various alternatives. For example after the 1890 rinderpest epidemic, when the WoDaaBe probably suffered even greater losses than in the 1968-73 drought, they were able to rebuild herds primarily through agriculture and gathering wild plants. They were able to subsist and invest surpluses in animals until they had become fully pastoral again in about 10 to 15 years. Because of the extension of agriculture, the WoDaaBe have been gradually pushed north into more arid zones, and in 1974 they did not have access to arable land, or to the plants they had been able to gather in the past. Nor did they have any alternative forms of employment. Niger has no industry to speak of and the WoDaaBe do not have marketable skills. In 1983, nearly 10 years after the preceding drought, herds were being depleted rather than reconstituted.

While it is important to be aware of the combination of factors that create dry season hardship, the overwhelming difficulty of this period is merely a symptom of other more important factors affecting the WoDaaBe economy.

At the time of the February 1985 Seasonality workshop the WoDaaBe's remaining animals were dying because of the failure of the 1984 rains. A year later, in February 1986, most have no animals or other resources and are dependent on sporadic government grain distributions that are insufficient for subsistence. There have been no changes in government policy that make their present prospects anything but dismal.

The policy implications of this scenario are clear. Minimum viable herds at the household level must be built up if pastoralists — 17 per cent of Niger's population — are not going to be a continuing drain on limited national resources. A viable herd allows families to support themselves and make optimum use of fluctuating resources that can be used for little else. A viable pastoral sector, based on herder-owned animals, contributes to the domestic demand for meat and provides exports for a country with few sources of foreign exchange.

Given the large sums of money that are being invested by the government and donors in short term stop-gap measures that do nothing to improve the long term situation, or on schemes that will not operate if herders themselves do not have viable herds, the process of herd reconstitution could well be begun through outright grants (animals are available for purchase in the markets). Subsequently there should be a credit scheme by which females are bought and loaned to needy families for several calvings, and are then either loaned to another family or sold to repay the initial debt. This is a system that has proved to be effective, particularly among WoDaaBe who scrupulously respect the terms of this arrangement based on a traditional system that has important social and economic implications for them.

To speed the process of herd reconstitution and to improve its longer term effectiveness, the impact of dry season decapitalisation can be countered by a short-term cereal credit scheme by which cereals are bought at low post-harvest prices and then sold at cost in the dry season when cereal needs and prices are much higher, and animals are in poor condition. By reducing dry season animal sales this has an important impact on household economies.

All of these interventions and other related measures can best be implemented through an institutional framework whereby herders are organised in associations that give them more bargaining power in the political process.[2]

To counter the impact of large-scale animal loss in bad years, a famine early warning system, including measures to reduce the collapse of livestock prices and simultaneous cereal price increases, must be implemented [e.g. see Swift 1985].

References

Dupire, M., 1962a, *Peuls Nomades: Etude Descriptive des WoDaaBe du Sahel Nigérien*, Travaux et Mémoires 64, Institut d'Ethnologie, Paris

—1962b, 'Trade and markets in the economy of the nomadic Fulani of Niger (Bororo)', in P. Bohanan and G. Dalton (eds), *Markets in Africa*, Northwestern University Press, pp 335-6

—1962c, 'Les facteurs humains de l'économie pastorale', *Etudes Nigériennes* 6, Institut de Recherches en Sciences Humaines, Niamey (reprinted 1972)

Loutan, L., 1982, *Nutrition et Santé chez un Groupe d'éleveurs WoDaaBe (Bororo) du Niger*, Project Gestion des Pâturages, MDR/USAID, Tahoua, Niger

[2] For a more detailed development of these ideas see Swift and Maliki 1982, 1984; White 1984a.

— and J-M. Lamotte, 1984, 'Seasonal variations in nutrition among a group of nomadic pastoralists in Niger', *Lancet* i, 945-47

Swift, J. J., 1985, *Planning against drought and famine in Turkana, Northern Kenya*, Oxfam and Turkana Rehabilitation Project

Swift, J. J. and A. B. Maliki, 1982, *Preliminary Evaluation of a Pilot Program to Create Herders' Associations in the Pastoral Zone of Central Niger*, Discussion Paper, Niger Range and Livestock Project, Tahoua, Niger

—1984, 'A cooperative development experiment among nomadic herders in Niger', *Pastoral Development Network* Paper 18c, Overseas Development Institute, London

Watts, M. J., 1983, *The Silent Violence: Food, Famine and Peasantry in Northern Nigeria*, University of California Press, Berkeley

White, C. H., 1984a, 'The WoDaaBe', in J. Swift (ed), *Pastoral Development in Central Niger*, MDR/USAID, Niamey, Niger

—1984b, 'Herd reconstitution: the role of credit among WoDaaBe herders in central Niger', *Pastoral Development Network* Paper 18d, Overseas Development Institute, London