

# African Boundaries

## Barriers, Conduits and Opportunities

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'Pastoralists and National Borders in Nigeria'

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# Pastoralists and National Borders in Nigeria

*Roger Blench*

## Introduction

Nigeria is one of the largest countries in West Africa and has a correspondingly extensive pastoral sector. The climate and ecology vary from arid in the north-east to extremely high rainfall zones in the south-east. In contrast to most neighbouring countries, Nigeria's substantial oil income has stimulated the development of large urban centres, especially in the humid zone bordering the sea-coast. The wealth of these cities, the corresponding demand for fresh meat, and the climatic limitations on local cattle production make them an attractive market for livestock traders and semi-commercial producers. Livestock production has traditionally been in the hands of the informal sector, and has depended on extensive systems, especially nomadic pastoralism. Although Nigeria has a history of attempts to replace pastoralism with ranching or other semi-intensive systems, these have never met with long-term success.<sup>1</sup> The consequence has been that the pastoral systems have continued to flourish and remain the major supplier of meat to the market.

Pastoralists, like hunter-gatherers, are a permanent source of irritation to central governments throughout the continent. They move about in what is (improbably) seen as a random fashion, ignoring administrative boundaries, becoming involved in conflicts with settled cultivators. Moreover, the prices consumers must pay for their animals reflect the current market situation, influenced by weather, season and disease, and therefore fluctuate markedly both within the year and between years. This creates problems for the civil servants on fixed salaries who represent government's principal constituency.

Because of this, the authorities, dominated by urban and cultivator interests, usually consider it their prerogative to control the movements and activities of pastoralists the better to meet the demands of the settled populations. Needless to say, pastoralists hold very different views about the purpose, management and even location of

their herds. This chapter examines this conflict of perspectives in the context of Nigeria, contrasting the situation and strategies of the pastoral peoples with official government policy. In particular, it focuses on the causes and consequences of cross-border movement, the weak allegiance of pastoralists to the nation-state and their willingness to move freely from one region to another to exploit the different situations prevailing in other West African countries.

The chapter begins with an overview of the pastoral peoples of Nigeria, their numbers, distribution and management strategies. It summarizes Federal Government policy as it relates to livestock producers. This is followed by a description of pastoralists' responses as they relate to disease management, environmental degradation, settlement and trade across international borders. Finally, some consideration is given to likely future trends and their policy implications.

### The situation of pastoral peoples of Nigeria

One of the striking aspects of pastoralism in Nigeria is the contrast between its actual complexity and the simple representations usually made of it. Pastoralism is strongly associated with the FulBe (Fulani) who are generally presented as a unitary group with a unitary culture.<sup>2</sup> There are in fact some fourteen other pastoral peoples in Nigeria (Table 5.1) apart from the FulBe, who are themselves divided into numerous subgroups.

Map 5.1 shows the approximate locations of these groups. It is evident that there is a major concentration of pastoral peoples in the semi-arid zone, especially in Borno and Sokoto, which still have large pastoral areas, unsuitable for cultivation due to the low rainfall and lack of water points. There are FulBe pastoralists throughout the country, but the diversity of pastoral groups is only in the north.

The scale of the pastoral societies is hard to estimate, as livestock producers are notoriously unwilling to reveal the size of their holdings to outsiders, and as taxes are reimposed, there is even more reason for concealment. However, the livestock populations of Nigeria in 1990, shown in Table 5.2, were estimated by a method that breaks down the figures into pastoral, village and urban. If an average pastoral holding is estimated at 100 head, and village cattle are assumed not to be owned by migratory pastoralists, then the number of pastoral households will be of the order of 110,000. Although camel and sheep pastoralists exist, their numbers are insignificant compared with cattle producers.

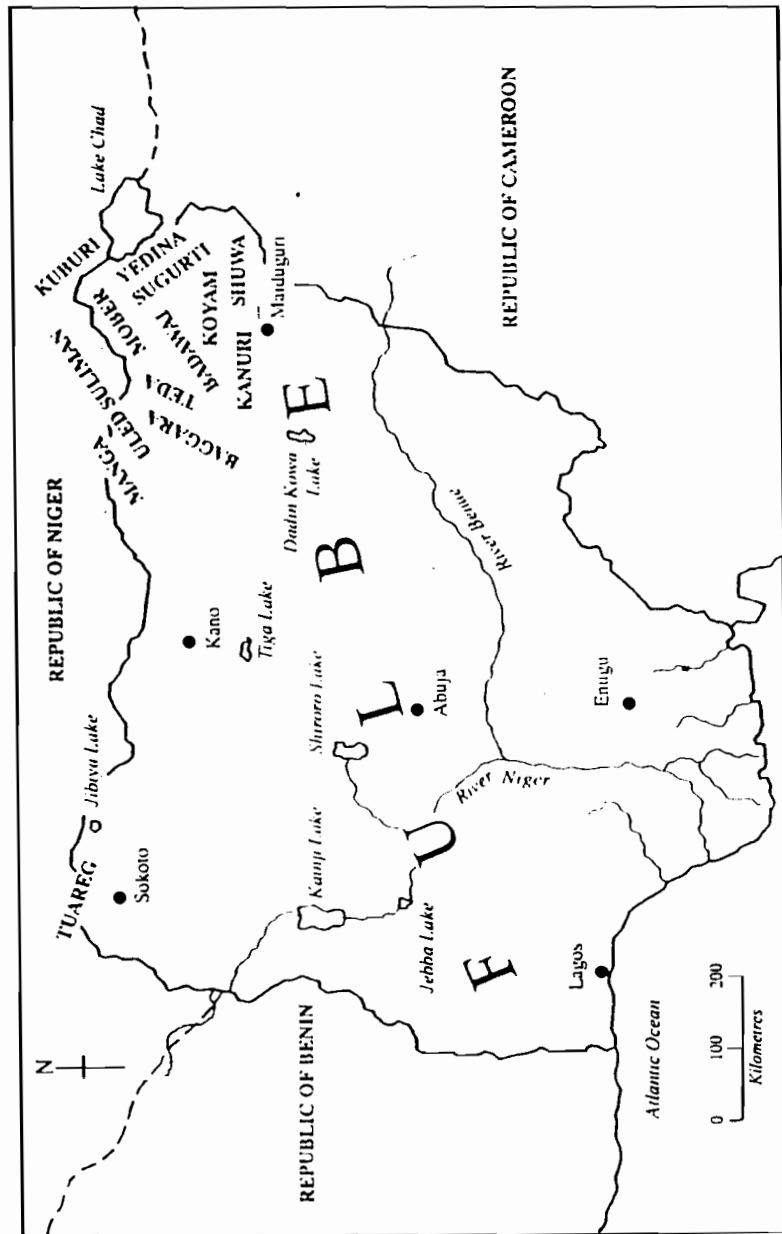
Table 5.1 Pastoral peoples of Nigeria

Group	Location	Main pastoral species†
<i>Arabs</i>		
Baggara	south of Geidam	Cattle
Shuwa	eastern Borno/Cameroon	Cattle
Uled Suliman	Komadugu-Yobe valley	Camels
<i>FulBe*</i>		
Anagamba	north-eastern Borno	Cattle
Bokolooji	northern Borno	Cattle
Maare	south-eastern Borno	Cattle
Sankara	north-western Borno	Cattle
Uda'en	north-eastern Nigeria	Uda sheep
WoDaaBe	north-eastern Nigeria	Cattle
<i>Kamuri group</i>		
Badawai	central Borno	Cattle
Jetko	north of Geidam/Niger	Camels
Kanuri'	Borno	Cattle
Koyam	south-central Borno	Cattle
Manga	north-west Borno	Cattle/Camels
Mober	north-eastern Borno/Niger	Cattle
<i>Kanembu group</i>		
Kuburi	extreme north-east Borno/Niger	Cattle
Sugurti	Lake Chad shore	Cattle
<i>Saharans</i>		
Teda (Tubu)	northern Borno/Niger	Camels
<i>Berber</i>		
Tuareg	north of Sokoto/Niger	Camels
<i>Others</i>		
Yedina (Buduma)	on Lake Chad	Cattle

Notes: \* Only a few representative groups noted.

† Almost all groups herd small ruminants

Source: adapted from RIM (1992, III)



Map 5.1 Location of principal pastoral groups in Nigeria

Table 5.2 Mean annual populations of traditionally-managed livestock

Species	Pastoral	Village	Urban	Total	% SE
All cattle	11,478,145	2,358,078	49,590	13,885,813	1.6
Goats	1,142,154	32,287,589	1,023,981	34,453,724	2.9
Sheep	2,678,152	18,356,718	1,057,732	22,092,602	3.2
Donkeys	6,872	920,828	9,132	936,832	3.9
Horses	3,396	194,706	8,110	206,212	5.9
Camels	11,050	76,241	548	87,839	8.2

Source: RIM (1992, 1)

### Subsistence strategies

Pastoralists are easily lumped together, especially in popular conceptions of 'nomads', as wiry, enduring characters who wander from place to place with no concern other than their herds. As elsewhere, pastoralists pursue a complex range of subsistence strategies, reflecting both ecological factors, cultural traditions and the species herded. Those involved in migratory movement can be divided into three broad categories; exclusive pastoralists, transhumants and agro-pastoralists.

Exclusive pastoralists are livestock producers who grow no crops and depend on sales of dairy products and animals to buy grain. These probably represent a very small proportion of the total number of pastoralists. Moreover, they present definitional problems, as it is common for herders whose grazing orbit is largely in Nigeria to be affiliated to a household in Niger that practises some type of opportunistic agriculture. Nonetheless, they are commonly encountered all along Nigeria's northern border.

Such pastoralists, most notably the FulBe, Koyam, Tuareg, Teda and Uled Suliman, may move very great distances every year. The cattle pastoralists usually have set migration routes and long-standing arrangements with individual farmers to make use of crop residues. They usually only diverge from their existing patterns in the face of a drought, a failure of the pasture or the spread of an epizootic. However, the camel herders, especially the Tuareg and Uled Suliman, are less dependent on crop residues and interaction with settled communities. Since camels and donkeys can digest a much wider range of fodder, the herders can exploit more remote pastures and their movements are considerably more flexible, varying from year to year.

Transhumant pastoralists have a permanent homestead and base at which the older members of the community remain throughout the year, growing crops primarily for their own use rather than for the

market. The men take away the majority of the herds in search of grazing, moving in response to seasonal changes in the quality of grazing and the tsetse-fly challenge. They leave the older members of the community with a nucleus of lactating females and return at the start of the wet season to help with crop cultivation. They have no traditionally-assigned grazing rights and have often been forced south by drought or population pressure in their original home areas. This pattern is very common both within Nigeria and among FulBe clans living along the Niger-Nigerian border. Their homestead is normally in Niger, although the herds will often spend much of the year in Nigeria.

There are substantial numbers of semi-settled pastoralists in many parts of the north, who cultivate sufficient areas to feed their families from their own cereal production. Most of the pastoralists in Borno should be described as agro-pastoralists, since almost all have farms on which they depend for staples. Agro-pastoralists hold land rights, use their own or hired labour to cultivate land and grow staple cereals such as sorghum, millet and maize. While cattle are still valued property, agro-pastoralists' herds are on average smaller than in other pastoral systems, possibly because they no longer solely rely on cattle. The finite grazing area around their village that can be reached in a day limits herd size. Agro-pastoralists are frequently involved in animal traction and their wives in the processing of milk for the market.

### Official policy and its consequences

Nigeria's official agricultural policy states that the general policy objective of the livestock subsector is to put all available livestock resources to best use.<sup>3</sup> This is to be achieved through increased production, either by expanding the resource base, by increasing the productivity of the existing resources through a systematic improvement of the national production system or both. Specific objectives of the subsector are said to be:

- (i) to make Nigeria self-sufficient in the production of livestock products;
- (ii) to improve the nutritional status of Nigerians through the domestic provision of high quality, protein-rich livestock products;
- (iii) to provide locally all necessary raw material inputs for the livestock industry;
- (iv) to allow for a meaningful and efficient use of livestock by-products;
- (v) to improve and stabilize rural income emanating from livestock production and processing;

- (vi) to effectively protect the rural livestock farmer from the unpredictable vagaries and risks incidental to livestock production;
- (vii) to provide rural employment opportunities through expanded livestock production and processing;
- (viii) to effect proper land use and maintenance of the ecosystem for expanded livestock production.

If one trawls through the bureaucratise, several elements can be disentangled from this:

1. That government policy aimed specifically at pastoralists is relatively sparse.
2. That most measures are aimed at intensification of production on a European model.

Government policy also has an implicit side, which can be extracted from the documents. This is best seen in recent policy documents such as the Perspective Plan for Agricultural Development, 1990-2005.<sup>4</sup> For example, the passage on rangeland development notes that 'Assuming the transhumant and semi-settled pastoralists of Nigeria own more than 85% of the national herd ... and the intention is to totally settle the pastoralists' and that it would be part of a 'Nomadic Sedentarisation Programme. The target of this programme is the nomadic herdsman. The programme would be implemented nation-wide.'<sup>5</sup> The National Agricultural Policy says, under the heading 'Sedentarisation':

Government will emphasise the allocation of land to nomadic pastoralists who, over the years, have become landless people. This will require government adjudication of land. Government will therefore pursue a legal acquisition of grazing lands for lease allocation to graziers.<sup>6</sup>

The view implicit in these statements can be summarized by the notion that there is a fixed national livestock resource over which the Federal Government has jurisdiction. This enables it to prescribe its management, marketing and patterns of movement. Most notably, there is no explanation or justification of the policy of settling nomadic herders, except for the reference to 'landless people'.<sup>7</sup> Because the resource is fixed it can be cited in planning documents as a justification for expenditures.

Another side of this is the lease of land to the herders. This is implicit in the Land Use Decree of 1978 which codified the principle that all land was vested in the Federal Government, which makes it available to the citizens under certain conditions.<sup>8</sup> Urban land is directly under the control of the State Governors and rural areas

under the jurisdiction of Local Governments. A policy that envisions total settlement and at the same time excludes outright ownership of land suggests a considerable degree of paternalism.

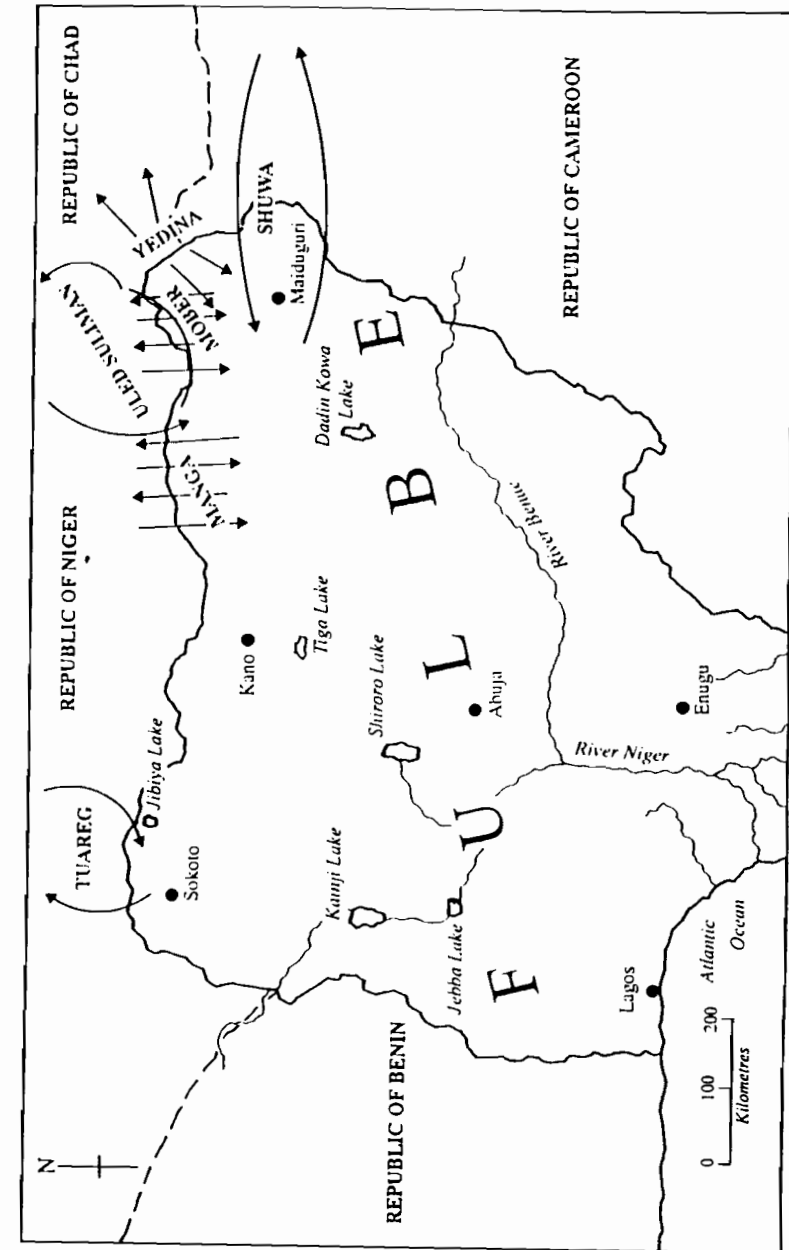
### Migrations and cross-border movement

One of the staples of the literature on pastoralism in Africa is maps which show the seasonal migrations of a particular group. Ideally, they show a dry season and wet season grazing site and perhaps a seasonal stopping-off point. While such maps may have validity in other parts of the continent, in Nigeria at least they represent a major distortion of reality. No pastoral group encountered had a transhumance route that could not be altered rapidly, and indeed movement plans are often changed in the course of migration. One of the demonstrations of this is the gradual southward relocation of the pastoral herds, as the semi-arid zone is increasingly cultivated. The main driving force of such colonization is experimental migration to underexploited regions.

Therefore, it is only with multiple caveats that Map 5.2, showing very approximate grazing orbits for the pastoral peoples, is introduced. This is based on field work in 1990 and shows the approximate maximum range of all groups except the FulBe. The main point of this map is to clarify the degree of cross-border movement; in effect it shows that almost all pastoral groups cross national borders, and many have their centre of gravity, as it were, far outside Nigeria.

To try to put a scale on or estimate the volume of this cross-border movement is difficult, but the NLRS provides some data on seasonal fluctuations within 1990, as cattle populations were estimated during both wet and dry seasons. The maximum number was 14,800,000, falling to 12,900,000, an intra-annual fluctuation of nearly two million cattle. This represents some 15 per cent of the mean annual cattle population (Table 5.2). Other species, especially small ruminants, camels and donkeys, show some seasonal fluctuation, but the scale is very small compared with cattle. If this figure is representative, then pastoralists all along the northern borders of Nigeria appear to have relatively untrammelled movement between Nigeria and neighbouring countries, especially Niger, but also Benin, Burkina Faso, Chad and Cameroon. This certainly agrees with anecdotal evidence and with representative interviews. In many ways, it would be remarkable if the situation were otherwise, since the borders are long, generally remote and difficult to police.

The references to migration make it seem as if mobility is a given for pastoral societies. However, movements, especially across national borders, are made for a variety of reasons, some of which



Map 5.2 Selected grazing orbits of Nigerian pastoral groups

are discussed below. In some West African countries and elsewhere in Africa, conflict with central administration and political repression have led to significant movements of pastoralists, but there are no examples of this in recent Nigerian history and so the topic is not discussed here. The single most important reason for both exceptional and regular migration is the quest for pasture and water for the herds. Rainfall increases further south and the vegetation becomes more abundant. The disadvantage of increasing humidity is the higher susceptibility of animals to disease, especially skin problems such as streptothricosis. Movement, especially in remote areas, has the advantage of constantly presenting the herds with a new source of food, and keeping them away from pathogens potentially present in neighbouring herds.

This type of movement is by no means inevitably north-south. The recent desiccation of Lake Chad has created a 'new' pasture resource that has attracted pastoralists from the surrounding countries, some of whom now move north or east in the dry season.<sup>9</sup> However, the importance of maintaining the herd is such that pastoralists are willing to risk the depredations of biting flies to gain access to the humid grasslands. In contrast, the Hadejia-Nguru wetlands, between Jigawa and Yobe states, supported a very large seasonal cattle population until recently. Most of the cattle were owned by FulBe and Manga who migrated from Niger every dry season, establishing regular transhumance routes and exchange relations with local farmers. The impoundments on the Koma-dugu-Yobe system have dried up much of the region, forcing the herders to become 'nomadic': that is, to seek pasture and water further south in Nigeria by scattering throughout the region.<sup>10</sup>

A major constraint on the ability to use pasture is access to water. Northern Borno, for example, is mostly rangeland, and could potentially support very large cattle populations. However, the absence of rivers makes much of this region dangerous for herders, who must move between wells and boreholes to water their cattle. As many of the recently installed boreholes have diesel-driven generators susceptible to maintenance problems, transhumance through this region becomes a risky enterprise.

Pastoralists' single greatest anxiety is the spread of epizootics within their herd. Rinderpest or CBPP can wipe out almost a whole herd, and there is virtually nothing that can be done once they take hold. Almost all pastoralists are aware that vaccines for these diseases exist, and can effectively protect their herds if administered correctly. However, their fear makes them potential victims of confidence tricksters, as well as liable to move at short notice.

Pastoralists have a relationship with the veterinary services in Nigeria which may best be described as adversarial. The prevention

and control of the major epizootics is the prerogative of the federal government, which has received European Community assistance for disease control. Rinderpest was virtually eliminated in West Africa in the 1970s, with the JP-15 vaccine. However, pools of infection remained, and in the early 1980s, complacency about the vaccination of calves allowed a new major outbreak to take hold. The campaign in Nigeria has been described by a veterinarian who took part, whose account suggests that pastoralists' fears were largely justified.<sup>11</sup>

The consequence of this is that they are attracted to the veterinary services offered in neighbouring countries, especially the Republic of Niger. By their account, the veterinary services in Niger offer a reliable vaccination programme, and maintenance of the cold chain that appears to protect their herds. This has to be paid for in CFA francs, a harder currency, which is a financial burden if stock sales are in Naira. Nonetheless, the value of protecting the herd is such that many pastoralists regularly drive their herds, or at least the animals in need of vaccination, across the border. Many appear to have acquired identity papers for both Nigeria and Niger, and in some cases, corresponding wives in both countries, to assist them in gaining access to the animal health services.

Nigeria is the most common destination for traded livestock in West Africa. The combination of wealth and large-scale urban demand in the humid zone has the consequence that demand far outstrips supply within the country. As a result, stock is brought in across almost all the land borders from Benin, Niger and Cameroon. Cattle predominate in this trade, which is on the hoof, although small ruminants, camels and donkeys are also moved. Once in Nigeria, the animals are sold in large markets, trucked to the south for sale in the major cities.

Livestock marketing in Nigeria has remained almost entirely in the hands of the informal sector, despite attempts to intervene from State and Federal institutions. An unquantifiable but important fraction of Nigeria's meat supply comes from neighbouring countries. Not all these animals pass through official control posts, and even the data from these posts are not always reliable. This situation has been affected by the fall in value of the Naira in relation to the CFA franc. To put this in context, in 1986, before the introduction of SAP, the Naira was worth approximately US1\$. In October 1994, the Central Bank rate was 22 and the bureau de change rate 120 Naira to the dollar. Even though the value of the CFA was halved in relation to the French franc in early 1994, real prices for stock exported from the Sahelian countries have fallen sharply. This has affected cross-border sales to an unknown extent, but conversations with traders suggest that cattle numbers may be as low as one-third of the levels in the

early 1980s. Despite this, the existence of large pastoral zones in Niger and Chad that cannot produce crops suggests that imports from the Sahel will continue simply because there is no other outlet for their production.

Another irony is that the changing internal economy of Nigeria has expanded the import of other livestock species, notably donkeys and camels. Donkeys were the usual work animals in northern Nigeria before the advent of cheap motorized transport. The expansion of the economy in the 1980s brought pick-ups and motorbikes to even the most isolated rural areas and effectively replaced donkeys. Even breeding females were sold or died and donkey use went into abeyance. However, with the rising cost of transportation, donkeys have again become economic and there is an attempt throughout the north to recover breeding nuclei. The principal source of fresh animals is Niger, where donkey breeding remains a major activity. The result has been the evolution of new donkey markets on the international border, as well as increased sales by pastoralists from Niger who come down to Nigeria in the dry season. This is also true for camels, which are widely valued as work-animals in semi-arid Nigeria, although they are too expensive for most farmers. Moreover, camels will not breed in Nigeria, so they must be bought afresh when they are exhausted.

### Implications of cross-border movement

Free movement of pastoral herds can have two alternative interpretations; either it spreads the grazing pressure on individual pastures so that they are used as evenly as possible, or it allows unprecedented numbers to converge on scarce resources. The second case is one version of the 'tragedy of the commons'. In practice, the latter seems to be the case. The high-altitude grasslands in the Middle Belt regions constitute some of the most attractive grazing in West Africa. Cameroon has a series of such grasslands along its central spine, while in Nigeria the Mambila Plateau is the most conspicuous example. The Mambila was probably first reached by expanding pastoral herds coming in from the Bamenda grasslands in the 1890s.<sup>12</sup> With no competition for pasture, the herds rapidly expanded to fill the plateau. By 1983, overgrazing had caused the disappearance of the soil on many hillsides.<sup>13</sup> By 1990, the population had undergone a major slump because of the degradation of the range.<sup>14</sup>

A situation with similar potential for degradation through common access to pasture is the floor of Lake Chad. The current state of affairs is described in more detail elsewhere,<sup>15</sup> but essentially the lake has all but disappeared, leaving a swampy carpet of pasture that is

both an attractive fodder and unclaimed by traditional 'owners' as it was not previously available. This has attracted herders from all the countries bordering on the lake and during 1990 cattle densities were higher than any other survey site in Africa.<sup>16</sup> Without controls, the pasture is likely to degrade in the same way as the Mambila grasslands.

The porous borders and virtually free movement described above have the consequence that disease becomes extremely difficult to control. If there is a residual pool of a pathogen anywhere in West Africa, it is virtually impossible to prevent its transmission. This was exemplified by the rapid spread of the rinderpest epidemic in 1983-84. Despite clear indications of its presence in neighbouring countries before it reached Nigeria, there was no mechanism to prevent it crossing the border and causing considerable mortality.

Another more long-term problem is represented by schemes to eradicate tsetse flies and the associated trypanosomiasis. Trypanosomiasis is still prevalent in many parts of the Nigerian Middle Belt and causes debility, low productivity and death in affected herds. The risk can be reduced by eradication of tsetse flies, through spraying, trapping or sterile male release. However, such operations are expensive, and only worthwhile if reinfestation can be prevented. Wild animal vectors, such as bush-pig and antelope, are less common than formerly, and cattle are now the principal agents bringing tsetse flies back to an area. Needless to say, tsetse-free regions of bush attract herders from long distances who frequently bring with them the flies, thus making the region unusable again. This situation has been most problematic along the Nigeria-Cameroon border. Both countries have had tsetse eradication programmes in selected regions. However, these have been co-ordinated neither in space or time, and as a result, pastoralists in both countries have moved across borders to sprayed areas and caused reinfestation.

Since livestock can be moved on the hoof and there is no effective means of registering herds, cattle dealers and traders frequently move their stock from Francophone countries bypassing official channels. Recognizing this situation, the Nigerian government has found it more practical to collect taxes at points of collection and sale. In Nigeria, most state governments have reimposed a *jangali* tax on movement, as well as charges for markets and veterinary posts. Within Nigeria, most cattle are moved in trailers along arterial highways, making the collection of taxes simpler.

Despite this, there are clearly financial advantages to traders who can move stock outside official channels, and the consequence is that there are many illegal and unmarked stock-routes across the international borders. These often terminate in unregistered bush markets, where animals may be bought and sold without papers.



Since most of the cattle and small ruminants sold in Nigeria are intended for slaughter, it is less advantageous to move them through the clandestine trade, as animals must enter the official trade network in order to be sold in the large markets of the south. However, work animals, especially donkeys and camels, are destined for villages in the north and can be sold by private treaty without government intervention.

Studies of the commercial livestock sector in Nigeria have shown that an insignificant percentage of ruminant livestock is produced by 'modern' or commercial methods.<sup>17</sup> This is in contrast to mono-gastric species, in particular chickens and pigs, where semi-intensive operations have made some inroads into the market. The conclusion is that for most species, traditional livestock producers are relatively efficient, generally because they are exploiting a common pasture resource, which is therefore free. Moreover, by buying a proportion of its meat needs from other Sahelian countries, Nigeria is effectively making use of their pasture resources. Since agriculture is possible throughout Nigeria, it is both logical and profitable to export crops to the Sahelian region. Although Nigeria was a net food importer at the time of the oil boom in the early 1980s, it may well be a net exporter at present, although the scale of illicit cereal sales across the northern borders is impossible to quantify.

This type of ecological stratification finds implicit recognition in budgetary allocations to livestock. Although government policy has impressive aims for livestock, in terms of the overall allocation to agriculture, relatively little is invested in ruminant production. The 1980s saw a falling percentage of the overall agriculture budget invested in livestock.<sup>18</sup> In other words, the informal sector has been relatively efficient in supplying the market with meat, regardless of government investment. This situation can be allowed to continue without major problems of supply to urban consumers. Nigeria can depend on producers outside its own borders to take up the slack by supplying stock that cannot be produced within the country.

### Conclusion

Some clear conclusions can be drawn from the discussion above. The most important is that pastoralists treat national boundaries as entirely permeable and will move freely from one nation-state to another to suit their individual advantage.<sup>19</sup> Moreover, their claim to nationality is entirely situational and they will freely switch allegiance if they consider this will benefit their herds.

The principal factors causing them to move across national boundaries are:

1. Fear of epizootics and variations in veterinary services.
2. Incoming settled cultivators and restriction of grazing access.
3. Increases in human or livestock populations and consequent shortages of grazing.

Governments of nation-states usually consider that they have a national herd with specific numbers attached to it and that they have the right to legislate on prices, movements and even stock management. In reality, pastoralists almost inevitably ignore agendas set by national governments, in favour of the interests of their herds. Broadly speaking, few West African governments have the resources to control pastoralists in more than a cursory way, accounting for the major dichotomy between government policy for pastoralists and actuality.

The results of essentially uncontrolled movement are:

1. Overgrazing of pasture resources.
2. Lack of control of epizootics and parasitic diseases.
3. Reinfestation of zones where tsetse has been eradicated.
4. Virtually unrestricted movement of traded livestock.
5. Disincentive to government to invest in ruminant production.

In the case of disease, this is clearly not a desirable situation, as the rapid spread of rinderpest in 1983-84 showed clearly. However, any change would essentially depend on increased civil order in the region and greater political will to police borders. The problematic exchange situation of the Naira and increased disorder in several neighbouring countries suggest that the situation is unlikely to change in the coming years.

### Acknowledgements

This study draws heavily on the Nigerian National Livestock Resource Survey (RIM, 1992, Vols I-VI), for which the author was director of ground studies, prepared for the Federal Department of Livestock and Pest Control Services, Abuja. I would like to take the opportunity to thank my colleagues as well as all the Nigerian government officials who in one way or another assisted the survey, but to emphasize that this paper represents my personal views and should not be interpreted in any way as reflecting official perspectives.

## Notes

- \* The paper has been revised to cover changes in exchange rates (which fluctuate substantially) to October 1994, when they were US\$1.00 = 22.00 Naira (Official/Central Bank Rate) or US\$1.00 = 120.00 Naira (Bureaux de Change). Administrative boundaries change frequently in Nigeria. A 'state creation exercise' took place in 1991 and the creation of further states has not been ruled out. The names shown on the maps apply to October 1994.
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  15. See R.M. Blench, 'The desiccation'.

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