

# **HIGHLIGHTS OF THE NIGERIAN LIVESTOCK RESOURCES REPORT**

**David Bourn**

## **BACKGROUND TO THE STUDY**

The Federal Government of Nigeria has long recognised the need for a wide ranging and objective assessment of livestock populations and systems covering the whole country. The problem has been how this might best be achieved. In the past, official livestock population figures have been derived indirectly from administrative records, such as vaccination returns and *jangali* tax payments, slaughter figures, trade movements, and import/export figures. Without exception, these sources of information are all open to question. They relate only to a limited number of livestock species, and give no indication of their levels of productivity.

It was therefore decided that an independent National Livestock Resources Survey was required, employing innovative techniques of low level aerial survey, systematic sampling and complementary ground studies. The survey was put out to international competitive tender and Resource Inventory and Management Limited (RIM) was commissioned to undertake the study in collaboration with the Federal Department of Livestock and Pest Control Services (FDLPCS), as a component of the Second Livestock Development Project (SLDP).

To begin with, a pilot study of livestock resources in Anambra and Niger States was conducted in 1989, to demonstrate the application of aerial and ground survey methods, and recommend how these could be extended to provide national coverage. After thorough review of the proposals and endorsement by participants of a specially convened workshop, the recommendations were accepted by the Federal Government, and a Technical Advisory Committee was established to monitor progress of the National Livestock Resources Survey, which took place during 1990 and 1992.

## **FIELD WORK**

The survey was supervised and coordinated by Resource Inventory and Management Limited working in close association with: Federal and State Livestock Departments; the National Livestock Project Division (NLPD); the Livestock Planning Monitoring and Coordination Unit (LIMECU); various Nigerian academic institutions; and the Aeronautical Industrial Engineering and Project Management Company Limited (AIEP). Many thousands of people took an active part in the study, and many thousands more responded to information requests. Their cooperation and assistance is gratefully acknowledged.

Field survey work took place during both wet and dry seasons and provided systematic sample coverage of the whole of Nigeria. The aerial survey involved more than 650 hours flying at only a few hundred feet above ground level, using two locally registered light aircraft. Ground teams visited 2148 villages to characterise local livestock production systems, and record the livestock holdings of 58 162 households. Urban livestock surveys were conducted in 24 major towns and cities throughout the country. Productivity parameters were obtained for all major livestock breeds. A supplementary survey conducted in early 1992 identified a total of 4622 commercial livestock enterprises, 1930 of which were visited and enumerated.

## **NIGERIAN LIVESTOCK RESOURCES REPORT<sup>1</sup>**

The findings of the National Livestock Resources Survey are presented in a four volume report, which provides the most comprehensive assessment of Nigerian livestock resources ever undertaken. Early drafts of the report have been extensively reviewed and necessary revisions made. The final report is widely regarded as a major contribution to knowledge and understanding of livestock resources and production systems in Nigeria, and thus provides a sound foundation for future livestock development planning to the year 2000, and beyond.

- **Volume I: Executive summary and atlas**

**Contents:** Background; Objectives; Methodology; Findings; Livestock production constraints; Development consideration; Further studies; Conclusions.

30 pages of text and 21 colour maps.

- **Volume II: National synthesis**

**Contents:** Introduction; Environment and livestock; Species assessments; Production characteristics; Constraints and development consideration. 466 pages, including numerous tables, figures and maps.

- **Volume III: State reports**

**Contents:** Concise summaries of each state's livestock resources

441 pages, including numerous tables, figures and maps.

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<sup>1</sup>The full report in four volumes, *Nigerian Livestock Resources* (ISBN 1 898 028 00 1) published in 1992 is available from the sales and distribution agents: Environmental Research Group Oxford Ltd, P.O. Box 346, Oxford, OX1 3QE, UK. Fax: (44) 865 794121/310447, Attn. ERGO. Telex: 83147 VIAOR G, Attn. ERGO. Price of the four volume set, including postage and packing: £100 (sterling). A copy of the full report is located in the ODI library, location 8813.

- **Volume IV: Urban reports and commercially managed livestock survey report**

**Contents:** Livestock populations in 24 urban areas and a nation-wide assessment of commercial livestock holdings.

345 pages, including numerous tables, figures and maps.

In addition to the documentary report, survey information has also been provided to the Federal Government in the form of a geographically coordinated computer database and information system for further analysis, as and when required.

## **SELECTED REPORT HIGHLIGHTS**

### **Nigerian livestock population estimates**

|          |            |                            |            |
|----------|------------|----------------------------|------------|
| Chickens | 82 400 000 | Other poultry <sup>1</sup> | 31 900 000 |
| Goats    | 34 500 000 | Pigs                       | 3 500 000  |
| Sheep    | 22 100 000 | Dogs                       | 4 500 000  |
| Cattle   | 13 900 000 | Cats                       | 3 300 000  |
| Donkeys  | 900 000    | Rabbits                    | 1 700 000  |
| Horses   | 200 000    | Guinea pigs                | 500 000    |
| Camels   | 90 000     | Giant rats                 | 60 000     |

<sup>1</sup>Includes: pigeons, ducks, guinea fowl and turkeys.

### **Valuation of Nigerian livestock resources**

The total value of livestock, based on mid 1991 market prices, is crudely estimated to be in the region of 60 billion Naira; undoubtedly a major national asset, and a renewable resource worthy of sustained future development.

### **Significance of cattle**

Cattle are the single most important livestock species in Nigeria, in terms of animal protein supply, value and biomass. They provide not only meat and milk, but also skin, bone, blood and horn products, and are used to transport people and loads, to pull ploughs, carts and ridgers, and to lift water from deep wells. Cattle are found throughout Nigeria, but are most common in the northern two

thirds of the country. Almost half the total cattle population is permanently resident within the sub-humid zone. Humped zebu cattle are by far the most common, but limited numbers of *keteku*, *muturu* and *kuri* cattle occur in south-western, southern and north-eastern parts of the country, respectively.

### **Decline of nomadism and the trend towards mixed farming**

Nomadic pastoralists are a rarity in Nigeria today. The great majority of pastoralists have settled, grow crops and practice a form of limited seasonal transhumance. Many former arable farmers have now also taken up animal husbandry. The use of animal traction is extensive in northern Nigeria and is spreading. There is therefore a clear trend towards the establishment of mixed farming systems.

### **Tsetse and trypanosomiasis**

The disease no longer poses the severe threat to livestock production that it once used to do. Human population growth, agricultural expansion, deforestation and hunting have greatly reduced the natural habitats and hosts of tsetse over extensive regions of the country.

### **Importance of village and urban livestock**

With the exception of cattle, the great majority of other livestock species are kept under a wide variety of traditional management systems in and around rural villages. Significant numbers of backyard stock are also found in towns and cities, particularly in southern states.

### **General production constraints**

Livestock production constraints vary from area to area, and species to species. The most widely reported constraints relate to: animal health care and disease control; the limited capacity of extension services; conflict between pastoralists and arable farmers; and the prevalence of theft, which deters investment.

### **Holdings of commercial livestock enterprises**

Most Nigerian livestock are kept under low cost, low input forms of management. Nationally, the more intensively managed commercial sector accounts for 11% of total chicken population; 3% of the pig population; and less than 1% of the cattle, sheep and goat populations. Commercial livestock enterprises are more numerous, and contribute a much higher proportion of livestock populations, in southern states than they do in the north.

Numerous poultry farms have gone out of business over the past few years, and many have switched to pig production. During early 1992 less than half the installed capacity of operational commercial poultry farms and piggeries was actually utilised. The cost of feeds and veterinary supplies were the most frequently quoted constraints on commercial sector production.

## CASHMERE PRODUCTION IN NORTHERN CHINA

Angus Russel

The author and Jim Boyd<sup>2</sup> spent two weeks looking at cashmere production and manufacturing in northern China, in late March and early April of this year. The following is a brief summary of their visit and impressions.

There are some 40 million cashmere goats in China. This represents about 45% of the total goat population, the majority being kept for meat, skin and coarse hair used in the manufacture of carpets.

The figure given for cashmere production is 5000 tonnes per annum. It is not clear, however, what this figure means in practice. Most production data refer to the weight of the fibre harvested by combing, which includes between 20 and 30% by weight of coarse hair and variable quantities of vegetable matter, scurf and sand. We were to find later that the weight of scoured, dehaired cashmere constitutes around 35-40% of the weight of combed material harvested from the animal.

On the basis of the above figures the average per head production of combed fibre is 125 g. The official figure given by the Ministry of Agriculture is 200 g (with a range from 20-400 g). The actual production of scoured dehaired cashmere produced per goat is thus probably of the order of only 50-60 g.

Cashmere production is recognised as being of considerable importance to the Chinese economy, and there are, throughout China, six breeding stations which have the objective of improving levels of production while maintaining the existing high quality. Opportunities for increasing the number of cashmere goats in the north, i.e. in Inner Mongolia and in the Liaoning Province, are limited, but cashmere production is expanding to more southerly areas.

There are some 500 000 cashmere goats in Liaoning Province, mainly in the lower lying counties, and a further 200 000 mountain goats in the higher altitude areas. The Animal Husbandry and Veterinary Research Institute's goat breeding station runs some 3000 cashmere goats, of which 1000 are breeding females, on 1500 ha mountainous area with the station buildings at an altitude of 550 m above sea level. Annual rainfall varies between 600 and 900 mm. The animals which we were shown would be the best examples of the Liaoning cashmere breed. The mean weights of combed fibre from breeding males and females

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<sup>2</sup>This article resulted from a two-week visit to northern China under the auspices of a China-UK Governmental Memorandum of Understanding. The visit was undertaken by Angus Russel, editor of *Scottish Cashmere News* and senior researcher at the Macaulay Land Use Research Institute and Jim Boyd of Johnstons of Elgin, the Scottish knitwear manufacturers famous for cashmere and lambswool garments. This article was first published in *Scottish Cashmere News*, Issue no. 25, June 1993.

were given as 1324 and 522 g respectively. Although 'yields' of 78-82% were quoted, the undercoat clearly contained substantial quantities of sand and soil and the weights of scoured dehaired cashmere were probably around 500 and 180 g respectively. The apparently very large difference between sexes would be due to the fact that the figure for females is the average of 1000 animals while that for the males refers to a small number of superior individuals kept for breeding. Mean fibre diameter was given as 15.8 microns, ranging from about 12.8 in juveniles to over 16 in adult males. The guard hair (17.5 cm) was considerably longer than the undercoat (6.2 cm) and this was probably effective in 'holding' the cashmere after it had been shed from the skin follicles and in preventing loss before combing.

Improvements in the standard of husbandry have allowed kidding to be advanced from April to March. It was considered desirable that combing in the second week of April be carried out after, rather than before, kidding, as was formerly the case.

Animals are first bred at 18 months of age. Females are culled after four kid crops, i.e. at 5 years of age; surplus males are left entire and are kept for cashmere production until they are 8 years old.

Extensive use is made of artificial insemination. Success rates of 90% using fresh semen and 50% using pelleted frozen semen were claimed. At the breeding station the kidding rate was 149% although the average for the Province is around 120%.

The Liaoning cashmere goats are relatively large, with mean body weights of mature males and females at the breeding station being given as 89 and 58 kg respectively, compared with 89 and 46 kg for the Province generally.

Liaoning stock has been 'exported' to many other provinces to improve levels of cashmere production and is also being used locally in crossbreeding programmes to increase the fibre production of native mountain goats.

In Inner Mongolia, there are some 4 million cashmere goats producing 1500 tonnes of combed fibre per year. This is equivalent to an average production of 375 g per head or around 120-150 g of scoured dehaired cashmere. Although this level of individual animal production is low, the quality is excellent, with an average fibre diameter of around 14 microns.

The physical conditions in Inner Mongolia are more severe than in Liaoning Province. The altitude is around 1100-1150 m above sea level, and the average annual rainfall is 150-180 mm. Plant cover is said to be around 40-50%, although in early April it appears to be substantially less than 5%. This apparently increases dramatically in the autumn when most of the rainfall occurs. Although the rainfall is low there is evidence of severe water erosion, which must occur in the autumn; there was also evidence of considerable soil

erosion by wind. The average stocking rate appears to be around 0.5 goat/ha, i.e.

about one quarter of that in Liaoning Province.

The Inner Mongolian Cashmere Goat Farm near Odoq carries some 2000 cashmere goats on 3500 ha. These comprise 1200 adult breeding females, 400 juvenile females, 50 adult males and 350 juvenile males. The high proportion of young males allows for provision of superior breeding stock to other farms throughout Inner Mongolia.

The Sam Bei White Cashmere Goat Farm in the western part of Erodoke county carried some 10 000 sheep and goats on 19 000 ha. In addition to 7000 cashmere goats there are 2000 Karakul sheep kept for their skins and 1000 other sheep for meat and leather.

The cashmere goat stock on both farms appeared to be kept under the same husbandry systems and to have very similar levels of performance. There was little if any difference between sexes in cashmere production, values quoted being around 400 g of combed fibre with an average cashmere fibre diameter of 14 microns. 'Yields' were quoted as varying between 70 and 83%, but the fleeces clearly contained a lot of sand, and further questioning revealed that the yield of scoured dehaired cashmere was around 33%, giving levels of production of about 130 g per head. Fibre diameter varied with age from less than 12 microns in juvenile females to 14 microns in adults.

On the breeding farms all the goats were white, although it was reported that a small proportion of coloured kids was born each year. Commercial herds seen grazing the semi-desert areas were predominantly white but contained approximately 20% black and brown individuals.

The Inner Mongolian cashmere goats are less prolific than those in Liaoning, although it was not clear whether the limitation is genetic or nutritional. The average kidding is about 105% with a weaning figure of 98%. About 10% of kids are born as twins and the incidence of barren does is about 5%.

As in Liaoning, does are artificially inseminated in late October and kid in March. Combing is carried out only once, in late April or early May, and takes approximately 15 minutes per goat. In contrast to Liaoning, males not required for breeding are castrated and kept for fibre production.

The level of supplementary feeding is high, being of the order of 40-50 kg of a maize and soya bean concentrate over 150 days of late pregnancy and early lactation. Hay is also fed. The goats graze the pastures all year, but are brought in to enclosures at night. In times of snow and rain, amounting to about only one week per year, they are kept in enclosures.

There appear to be no infectious diseases of any consequence, but stock are treated twice yearly for internal parasites and are sprayed twice yearly for ectoparasites (presumably lice).

On the Sam Bei farm there are 13 wells providing water for the irrigation of areas used to make hay for winter feeding.

In both Liaoning and Inner Mongolia improvements in production are being

sought through selective breeding. Most of the selection is applied on the male side. Preliminary selections on the basis of conformation are made at birth and weaning. Immediately prior to the first combing, a mid-side fibre sample is taken and evaluated for diameter, length and crimp.

Fibre diameter is measured using a projection microscope and although only 200 fibres are measured to the nearest 2.5 microns the resulting mean value appears to be accurate and to accord with the more sophisticated measures subsequently made on the dehaired fibre by the end-user. Crimp is evaluated as the difference between relaxed and stretched fibre lengths.

It was claimed that selection of breeding stock was made on the basis of weight of combed fibre, fibre diameter, length and crimp, but despite detailed questioning we could find no evidence of the incorporation of these parameters in any selection index. It also appeared that there were no estimates of heritabilities or genetic correlations between these traits. This was somewhat surprising as estimates of such parameters are used in sheep breeding programmes.

We visited two woollen mills in Dalian, one in Huhhot, and a cashmere dehairing plant in Otog. These were wholly owned by Chinese interests and equipped with Chinese plant. In the mills the machinery was very old and only about 20% appeared to be in use. The mills were grossly overstaffed and the quality of the knitwear produced was very poor. By contrast, the small cashmere dehairing plant in Otog, with a throughput of about 1 tonne per month was modern and the standard of dehairing was comparable to that achieved by the best companies in the West.

We also visited the showroom of the Dalian Golden Land Worsted Company which is a joint venture with American capital. Although we did not see the manufacturing process, the end product was impressive in both its quality and in the range of range of worsted cloth.

In Inner Mongolia we visited the Dongsheng Cashmere Industry Development Company, but were unable to see the mill in operation because of a power cut. There was evidence, however, of heavy investment of Japanese equipment, and many of the end products were high quality. The cashmere sweaters manufactured by this company were of a good standard and were widely available for sale in the department stores we visited in Beijing, Liaoning and Inner Mongolia as well as in retail outlets in many hotels and airports.

The growing of cashmere is currently a profitable agricultural enterprise in China and efforts are being made to expand this form of production. The scope for increasing the number of cashmere goats in the traditional cashmere producing areas such as Liaoning and Inner Mongolia appears to be very limited as there are already problems of severe overstocking. There is some scope in these areas for increased per animal production, but progress in this direction is likely to be very slow. Significant increases in production are more likely to be

achieved in other provinces through the upgrading of native breeds by crossbreeding with superior cashmere stock, but it is impossible from a short visit to only two provinces to predict how quickly this will take place. It appears likely, however, that the rate of increase in domestic use of cashmere and internal sale of cashmere garments will exceed the rate of increase in the production of the raw material. If this prediction is correct it will inevitably lead to a decrease in the quantity of cashmere available for export and to a consequent substantial increase in the world price of raw cashmere.

# **FULANI SETTLEMENT AND MODES OF ADJUSTMENT IN THE NORTHWEST PROVINCE OF CAMEROON<sup>3</sup>**

**Michael Boboh Vabi**

## **ORIGINS, MIGRATION AND SETTLEMENT**

The paper presented here discusses issues relating to Fulani migration and settlement in the Northwest Province of Cameroon. The origin of the Fulani in the Northwest Province can be traced to Kano State in Northern Nigeria and according to Awasom (1984), the movement of the Fulani from the emirate of Kano started in 1875. This was precipitated by a rinderpest pandemic which decimated herds of African cattle in the mid and late 1890s. From then onwards, Fulani clans began migrating to various destinations across West and Central Africa. As a result of this epidemic, and also based on information about the practicability of rearing cattle in the Bamenda Grassfields (Northwest Province), three Fulani of the *Goshi* clan set out on an exploratory mission to the province in the early 20th century. In Jakiri and Nso (Bui Division) and Kedjom-keku (Mezam Division), the three emissaries were overwhelmed by the extensive pasturelands, cold air, and numerous natural and salt springs of the province. These discoveries and information about the hospitality of the people, were sufficient reasons for some Fulani of the *Goshi* clan to continue their migration from Adamawa to the Northwest Province. Initial contacts with the chief of Kedjom-keku and his subjects were fruitful as the entire Sabga hills were allocated to them. The chief of Kedjom-keku and his subjects perceived Fulani migration into their territory as an opportunity to reduce beef shortages in the village. Information about Fulani settlement and the ensuing advantages to the people of Kedjom-keku also spread to neighbouring villages resulting in a scramble for subsequent Fulani immigrants by other local chiefs and their subjects. Though water and pasture availability were important considerations determining settlement locations, subsequent waves of Fulani immigrants were also at liberty to negotiate settlement among the indigenous populations and not necessarily to settle where their kin were found. Though some clans have concentrated in certain divisions of the province, they are generally found in all the divisions of the province.

In terms of place of birth, 82% of those contacted revealed that they were born in the Northwest Province while 86% reported having restricted their

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<sup>3</sup>This paper reports on work carried out in Northern Cameroon sponsored by ORSTOM (Organisation de la Recherche Scientifique et Technique d'Outre Mer). The information used is abstracted from the author's doctoral dissertation and supplemented by interviews with key Fulani informants from the Northwest Province between 1989 and 1992.

movements within the province (Table 1). Table 2 shows a low frequency of abandonment of camps, a tendency towards more permanent settlement and more effort, time and money being spent in building permanent living houses, similar to those of resident ethnic groups (see Table 3).

**Table 1: Distribution of Fulani in the Northwest Province of Cameroon according to place of birth and place of previous settlement<sup>1</sup>.**

|                    | <b>Place of birth:<br/>number of<br/>respondents</b> | <b>% of total</b> | <b>Previous<br/>place of<br/>settlement:<br/>number of<br/>respondents</b> | <b>% of total</b> |
|--------------------|--|-------------------|--|-------------------|
| <b>Cameroon</b>    |  |                   |  |                   |
| Northwest Province | 106  | 81.5              | 111  | 85.5              |
| Adamawa            | 13   | 10.0              | 5  | 3.8               |
| Western Province   | 2  | 1.5               | 6  | 4.6               |
| Northern Province  | 2  | 1.5               | 0  | 0.0               |
| Southwest Province | 0  | 0.0               | 2  | 1.5               |
| Littoral Province  | 0  | 0.0               | 2  | 1.5               |
| <b>Nigeria</b>     | 7  | 5.5               | 4  | 3.1               |
| <b>Ghana</b>       | 0  | 0.0               | 1  | 0.8               |
| Total              | 130  | 100.0             | 130  | 100.0             |

**Table 2: Distribution of Fulani in the Northwest Province according to frequency of change of residence since birth<sup>1</sup>.**

| <b>Number of<br/>times</b> | <b>Number<br/>responding</b> | <b>Percentage</b> | <b>Percentage of total<sup>2</sup></b> |
|----------------------------|------------------------------|-------------------|--|
| None                       | 61                           | 46.9              | -                                      |
| One                        | 13                           | 10.0              | 18.8                                   |
| Two                        | 26                           | 20.0              | 37.7                                   |
| Three                      | 14                           | 10.8              | 20.3                                   |
| Four                       | 3                            | 2.3               | 4.3                                    |
| Five                       | 7                            | 5.4               | 10.1                                   |
| Six                        | 3                            | 2.4               | 4.3                                    |
| Seven                      | 1                            | 0.8               | 1.4                                    |
| Eight                      | 2                            | 1.5               | 2.9                                    |

<sup>2</sup>Calculated as a percentage of 69 Fulani who reported having changed residence since birth.

**Table 3: Distribution of Fulani in the Northwest Province according to house-style and building materials<sup>1</sup>.**

| <b>House style/<br/>Building materials</b> | <b>Number<br/>responding<sup>3</sup></b> | <b>Percentage</b> |
|--|--|-------------------|
| <b>House style</b>                         |  |                   |
| Rectangular                                | 105                                      | 80.8              |
| Circular                                   | 66                                       | 50.8              |
| Cemented floor                             | 42                                       | 32.3              |
| <b>Building materials</b>                  |  |                   |
| Straw only                                 | 17                                       | 13.1              |
| Mud and thatch                             | 31                                       | 23.8              |
| Bricks and thatch                          | 30                                       | 23.1              |
| Mud and corrugated iron sheets             | 4  | 3.1               |
| Bricks and corrugated sheets               | 94                                       | 72.3              |

<sup>1</sup>Source: Vabi 1991

<sup>3</sup>Total number responding = 130, categories are not mutually exclusive.

Regular reference to place of birth in particular, is considered as evidence of the permanent settlement of the Fulani and their assimilation into indigenous socio-cultural systems of the Northwest Province. Also, gradual shifts from Fulani traditional sources of subsistence – cattle rearing and milk consumption – to indigenous ethnic group agricultural practices and life styles tend to precipitate Fulani identity change.

## LAND USE, ACCESS AND RIGHTS

Because the Fulani in the Northwest Province did not initially or for some time engage in crop cultivation, or keep their cattle in one location throughout the year, they constituted little threat to indigenous groups in the competitive use of the land. Though some indigens nursed fears that the Fulani might eventually settle permanently and claim ownership rights over their lands, such fears were not taken seriously. Thus, Fulani movements into, and settlement in the North-

west Province did not immediately raise problems of ethnicity and ethnic consciousness relating to land-use rights.

With the constant inflow of Fulani into the province, coupled with generalised complaints of crop damage by Fulani cattle, cattle control rules were enacted and enforced by a Native Authority Ordinance in 1947. These rules not only restricted Fulani movements to specific rainy and dry season grazing areas but also recognised their use rights over such grazing areas. The enactment of these rules was accompanied however by the imposition of a cattle tax (*Jangali*). Unlike in Nigeria where Awogbade (1983) has pointed out that the development of grazing reserves was accompanied by tenure policies conferring exclusive tenure rights to the Fulani, ownership rights over the wet and dry season grazing areas as recognised by the Native Authority Ordinance did not grant the Fulani of the Northwest Province ownership rights over such areas. Rather, the 1947 Ordinance repeated and reinforced the stipulations of an earlier land and native rights ordinance which conferred all lands to the *natives* with the exception of government-owned lands. The 1927 Land and Native Ordinance defined a *native* as one born of parents who originated from the area in which (s)he was living (Awasom 1984). Furthermore, the 1947 ordinance stipulated that lands granted to non-natives prior to 1947 needed authority approval. For such lands, only the Governor General of Nigeria and Southern Cameroons could transfer native lands to a non-native. The Ordinance further stipulated that such transfers had to conform to indigenous laws and customs regulating land distribution and use.

These measures systematically excluded the Fulani from having access rights to land. Strategies were being developed by the indigenous ethnic groups to evict the Fulani from most of the areas on which they had settled. The claims for eviction by indigenous populations, were reinforced by continued crop damage cases brought to the attention of the administration particularly by women of indigenous origin who constituted, and have remained the bulk of the crop farming population. In 1952, a British official policy supporting Fulani permanent settlement in the province was not only vehemently contested by indigenous populations, but was received with mixed feelings by some colonial administrators. For example, the then British assistant divisional officer of Wum, objected to the policy on the grounds that the Fulani were oscillating between a number of areas. A series of outbreaks of anti-Fulani violence involving damage to their settlements, mass killing of their cattle and public demonstrations broke out in 1958. These anti-Fulani feelings, together with the unfavourable tenure situation, were carried over to independence in 1961, and have continued well beyond.

A new land law was enacted in 1974 and according to Roy (1987), the proposed reforms re-activated anti-Fulani feelings by bringing into the open concepts such as individual ownership and control. However the 1974 land law has also made it possible for the Fulani to more forcefully establish land-use

rights and to initiate official processes of obtaining individual ownership rights over their grazing areas and settlement locations. Recent studies in the province (Vabi, 1991) found that more than half of the Fulani interviewed (52.3%) indicated having ownership rights over their settlements recognised by various indigenous ethnic communities. They claim to have inherited such lands from their ancestors, though proofs by way of certificates of occupancy were not common. The lack of certificates of occupancy is a common phenomenon in the province and multiple forms of tenure arrangements co-exist.

However, there remains a strong feeling among many of the Fulani of the Northwest Province that state rural development policies favour crop farming and indigenous ethnic groups because land rights are more readily granted for crop production and to non-Fulani. Areas originally defined as grazing land by colonial administrators and controlled by Fulani leaders (*ardos*) have been dwindling at an alarming rate all over the province. In Mezam, Bui, Donga/Mantung and Menchum Divisions where pressure on land for both crop and cattle production has been increasing, both indigenous farmers and the Fulani claim primacy for the ownership of land. Thus, disputes over access to land have become the most difficult and recurrent problems facing administrative officers in the province. The introduction of the use of animal traction and tractors for ridging by the various agencies of the Northwest Development Authority (MIDENO) in the 1980s as well as improvements in rural road networks, are reinforcing the extension of cultivated areas and thereby increasing the pressure on land.

## CROP FARMING

A characteristic feature of the Fulani in the Northwest Province since the 1970s has been the cultivation of maize, beans, potatoes, cassava and a variety of vegetables around their homesteads. These farms help to reduce complete dependence on indigenous cultivators for food crops thus allowing reduction of cattle off-take. The Fulani also see their involvement in crop cultivation as a means of reinforcing their rights over the areas on which they are settled.

All over the province a considerable proportion of Fulani cultivators use crop residues and household wastes to improve the fertility of their farm fields. These methods of soil fertility management, together with the intensive cultivation of previous kraals, enable the Fulani to practise an almost continuous cropping system involving fewer fallow years than the crop farmers of indigenous origin. A concurrent study of female Fulani economic activities in the region revealed that crop cultivation was predominantly a male activity

though women participated in the harvesting and transportation of produce to

households (Vabi and Olawoye, 1992).

## **LIVESTOCK - HERD SIZE, OWNERSHIP AND MANAGEMENT**

Mean herd sizes among the Fulani interviewed were estimated at 73.6 cattle (standard deviation =  $\pm 20$ ), 16 sheep, 7 goats and 12 chickens per household. The majority of herds consist of cows and heifers, suggesting higher off-take of male than female animals. Individual animal ownership is not common and most animals are collectively owned by members of a household, including household-head, wife (or wives), blood-related brothers, parents and adult children. Mean household size was 12.5 persons; (with a coefficient of variation of 68%). Household sizes are similar to a mean household size of 11.6 (coefficient of variation of 79%) reported among non-Fulani households in the province by Vabi (1991).

Herd management among the Fulani of the Northwest Province is based on two husbandry practices: herd substitution and herd movement. Herd substitution consists of the gradual replacement of the less hardy White and Red Fulani cattle with the more environmentally-adapted *Gudhali* and their crosses. Most households rear sheep rather than goats because of the ceremonial role that sheep perform. Also because goats are less easily controlled, they increase the possibility of damage to crops. Chickens are found in most Fulani households, generally owned by women.

Until their more permanent settlement in the Northwest Province, the Fulani practised long-distance, seasonal movement often accompanied by complete shifts of homesteads. Although such movements are still practised around the Cameroon-Nigerian border in Donga/Mantung division, these management practices are losing popularity since they involve complete shifts of both animals and people to distant locations, quite often into Nigeria.

Indeed, cattle movements at the onset of the dry season are regulated by the Provincial Service of Livestock, Fisheries and Animal Industries (MINEPIA), thus reinforcing movements into specific areas. Pastoral movements in the province can be described as either transhumance or herd rotation. Transhumance involves movement from the hills to the plains/lowlands of dry cows, heifers and bull(s) under the control of a few younger members of the household and occurs at the start of the dry season in November, and generally lasts about three months. Herd rotation may be undertaken in either the dry or rainy season and involves changes in kraal use within the same camp.

Movement to the plains coincides with the end of the maize harvest (the principal crop) which opens up the possibility of grazing cattle on crop residues left over on farm fields. However, the intensive mixed farming systems practised by crop farmers are such that not all the crops incorporated into the system

mature at the same time making it difficult for cattle to be moved into farm fields after the major crop has been harvested. In November, the rice fields of Ndop (Ngoketunjia division) and Tingo (Mezam division) that usually become swamps in the rainy season, are used by herdsman without any bilateral grazing arrangements. By the end of the dry season (February/March), these areas are often completely denuded by cattle. Arrangements for crop residue grazing on farm fields between the Fulani and cultivators of indigenous origin after harvest are not common in the province but have been reported on a small scale in some villages around Bali sub-division.

## **INDIGENOUS VETERINARY KNOWLEDGE AND PRACTICES**

The continual increase in the price of veterinary drugs, compounded by their prolonged absences from the state-owned Veterinary Drug Store (OPV), has continued to encourage the development of indigenous procedures for handling different livestock diseases. According to Vabi and Ndi (1991), Nuwanyakpa *et al.* (1990), and Ndi *et al.* (1992), Fulani descriptions of cattle diseases in the province compare favourably with those of trained veterinarians. Elsewhere, Mathias-Mundy and McCorkle (1989) revealed that diverse cattle disease preventative measures involving various livestock management techniques and simple magic-religious practices, complemented by the use of many plants of veterinary importance, are often utilised by the Fulani. According to Ibrahim (1984) and Mathias-Mundy and McCorkle (1989), the Fulani ably distinguish two types of cattle ailments; those they can handle and those that require the intervention of veterinary extension agents. In the Northwest Province Vabi and Ndi (1991) pointed out that the Fulani acknowledged that Brucellosis (*Bakalle*), Babesiosis (*Sille-Dji-jam*) and infectious keratoconjunctivitis (*Ja-agu*) can better be treated by trained extension agents and also confirmed that veterinary extension agents are usually called upon only for livestock ailments for which help can not be obtained within the group or for which they perceive less money will be spent. Quite often, some doses of standard drugs are administered alongside indigenous treatments.

Indigenous herbal treatments generally consist of either burning plants of recognised medicinal value to ashes or immersing them in water for some moments (or even days) or boiling. When burnt, the powder is mixed with either water or honey and the solution given as a drench. In some cases, infected animals are constrained to inhale the smoke or vapour emanating from pulverised plants.

The Fulani of the Northwest Province have developed herd management techniques with in-built preventive and curative measures. These management techniques have also been documented among other pastoral groups (Ezeomah,

1987; Ibrahim *et al.* 1983; Mathias-Mundy and McCorkle, 1989) and welfare include:

- movement away from disease-infested areas;
- risk-spreading involving the breaking up of herds and grazing them separately;
- regular manual de-ticking;
- burning of established disease infested areas and;
- dietary supplementation of sick and lactating animals and calves.

## **CONCLUSION AND IMPLICATIONS**

The Fulani groups in this study differ from other Fulani in the degree to which they have settled, their systematic hill-top and lowland grazing management, and their rights over land. Emerging modes of adjustment consisting of herd substitution, seasonally-determined transhumance, herd rotation, uptake of crop cultivation, and the rational exploitation of the natural environment, confirm their ability to adapt to changing physical, ecological and socio-political environments. Therefore, even if a social distance still persists between them and indigenous ethnic groups, rural resource planners in the province no longer have reasons to continue treating them as nomads and a stranger ethnic group.

The author believes that in Northwest Province of Cameroon communal grazing will remain the most appropriate herd management strategy for the Fulani for some time to come and that little or no social and political benefit would accrue to either the Provincial Administration or the Fulani, at least in the immediate future, if policing were concentrated on enforcing legal *individual* ownership over grazing areas. Frequently, both the Fulani and indigenous tenure systems recognise the areas (both hill and lowland), on which cattle have regularly grazed over the years, as communal grazing land, and that these come under the joint control of local chiefs, traditional village councils and Fulani *ardos*.

However, despite this and the Fulani's ability to adapt to changing socio-cultural and environmental conditions, the Fulani of Northwest province still face problems associated with management of their herds, ownership rights of land, cultivation rights of land and constant threats of eviction from the province. Problems relating to Fulani herd management find their roots in inherited cattle husbandry practices. Problems concerning rights over land, other than that used for communal grazing, stem from existing indigenous tenure regulations which dominate land allocation in most rural communities in Cameroon. This must be taken into account by state policy makers.

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