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SEDENTARISATION OF CATTLE FARMERS IN THE DERIVED SAVANNAH REGION OF SOUTH-WEST NIGERIA: RESULTRS OF A SURVEY

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SUMMARY

The aim of this study was to assess the process and extent of sedentarisation among Fulani cattle owners in the derived savannah zone of south-west Nigeria. The results, based on a survey of 66 randomly-selected cattle owners, indicate an on-going process of settlement. Previously cattle owners visited the zone for dry season grazing but an increasing number were found to be settling and becoming mixed livestock/crop farmers. Generally herd sizes were large among recent settlers but with longer duration of settlement and with cattle rearers' involvement in crop production, the herds became less mobile between seasons and herd size decreased and the proportion of farms with mixed zebu/trypanotolerant cattle herds increased. There was also evidence that some indigenous Yoruba crop farmers were becoming mixed farmers by purchasing cattle, hiring Fulani herdsmen for management, then taking up the management themselves.

INTRODUCTION

The derived savannah and forest zones of West Africa have generally been considered unsuitable for non-trypanotolerant livestock because of tsetse fly transmitted trypanosomes. Previously owners grazed their cattle in the humid zone only during the dry season, and were forced to return north in the wet season to avoid the tsetse flies. Over the decade, however, there has been an increase in cattle being kept in the zone in the wet season.

In Nigeria and elsewhere, the level of tsetse challenge in these zones is declining as a result of land clearance for agriculture, changing climatic patterns, and tsetse control programmes (Bourn, 1983; Ikede et al., 1987). The increasing incidence and severity of bush fires in the derived savannah areas have also contributed to the decline. Ikede et al. (1987) reported a relatively low incidence of both tsetse fly and cattle trypanosomosis in the derived savannah, and Akinwumi and Ikpi (1985) estimated that almost 80% of the

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cattle kept in the humid zone of southern Nigeria were now non-trypanotolerant breeds. RIM (1988) estimated from a 1982 aerial survey that the dry season population of over 300,000 cattle in the derived savannah decreased by only about 40% in the wet season, indicating an increasingly stable cattle population in the zone and thus presumably a tendency towards sedentarisation among cattle owners.

This paper presents the results of a survey of the extent of sedentarisation among Fulani cattle owners in the derived savannah areas of south-west Nigeria and associated changes in their household characteristics. Preliminary results of the survey were reported earlier (Francis et al., 1987).

METHODS

This survey was conducted in parallel with a survey of the prevalence of trypanosomosis (Ikede et al., 1987). Cattle owners were selected in the derived savanna areas of 5 states in south-west Nigeria: Ogun, Oyo, Ondo, Bendel and Kwara. In each state, 2 sample areas were chosen and between 3 and 12 cattle owners were selected from each area, according to density of Fulani settlement as reported by the Divisional Veterinary Superintendent. No information was available on the actual number of settled Fulani cattle farmers in the survey area, so a completely representative sample was not possible.

Data were collected between February 1986 and March 1987 from 66 sedentary cattle owners, 34 during the wet season and 32 in the dry season. Purely nomadic herds were excluded from the survey. The objective of the survey was to identify indicators and measure the extent of sedentarisation among the sample farmers. Five indicators of sedentarisation were considered: duration of settlement at the present location, distance from any previous settlement, seasonal movement of cattle, adoption of crop cultivation and housing pattern. Some features of herd management, e.g. ownership and management of cattle, cattle herd size and composition, cattle breeding, supplementary feeding of cattle and small ruminant ownership were also investigated.

A post-survey classification showed that out of the 66 sample households owning cattle, 53(80%) were Fulani and the remaining 13(20%) were Yoruba, the ethnic group indigenous to south-west Nigeria. Subsequent analyses have revealed that the Yoruba possessed a number of traits different from the newly settled Fulani. Therefore, the distinction between the 2 groups was maintained in the analysis whenever it was found appropriate although the number of Yoruba cattle owners in the sample was small.

RESULTS

Indicators of sedentarisation

The distribution of Fulani and Yoruba households according to the criteria of sedentarisation is shown in Table1. Approximately 57% of Fulani and 69% of Yoruba households had been in their present settlement for over 5 years, nearly 38% and 46% of them respectively for over 10 years. Fifty-seven percent of Fulani and 82% of Yoruba households were either permanent settlers or came from a different location within the

same local government area or the same state: the remaining households came to their present settlements from a more northern location in the sub-humid/semi-arid zone.

Over 85% of the cattle owners either did not move at all from their present settlement between seasons for grazing and/or watering their cattle, or moved only up to 5 km, staying away for one to 3 nights before returning to base. Long distance movements commonly mean 2 to 3 weeks stay in temporary camps. Most informants moved in search of either better grazing land or water. The same reasons were given for choosing their present sites.

Over 70% of the cattle owners had adopted crop cultivation; the majority of them producing a mixture of different grain, vegetable and fruit crops. Ninety-six percent of those settled at the present location for over 10 years produced crops, compared with 62% of those settled for less than 10 years.

Any Yoruba-type housing structure (of concrete or clay blocks, with corrugated iron roof) was considered permanent; other type(s) made with lighter materials such as tree branches or crop residues, were considered temporary. On this basis, about 46% of the Yoruba households but only 17% of the Fulani had permanent housing structures. As will be discussed later, this distinction may not accurately represent housing permanency for the Fulani.

Table 1: Indicators of the degreed of sedentarisation of Fulani and Yoruba cattle owners

Indicator of sedentarisation	% households	
	Fulani	Yoruba
Duration of present settlement (yrs)		
Under 1	26.4	15.4
1-5	17.0	15.4
6-10	18.9	23.1
Above 10	37.7	46.1
Location of previous settlement		
Same as present or a different site within same state	57.0	82.0
Outside state	43.0	18.0
Seasonal movement		
None	45.3	46.1
1-5 km	39.6	46.1
Over 20 km	15.1	7.8
Crop cultivation		
None	22.6	30.8
Single crop	11.3	–
Mixed crop	66.1	69.2
Housing structure		
Temporary	83.0	53.8
Permanent	17.0	46.2

Changes associated with sedentarisation

Ownership and management of cattle

Generally farmers were reluctant to answer questions on ownership. Only 34 Fulani and 6 Yoruba farmers disclosed this information. Of these 34 Fulani herds, 28 were owned by a single person or his family, and 6 were owned jointly with either relatives or outsiders. The corresponding figures for the Yoruba were 4 and 2 herds.

When the question of ownership and management was posed from a different angle, 8 of the 13 Yoruba cattle owners reported managing their cattle themselves while the other 5 employed Fulani herdsmen. Some of these Yoruba-owned Fulani managed herds might have been reported as jointly-owned herds. The Fulani herdsmen were generally considered caretakers rather than joint owners, entitled to every second or third off spring and usually the milk, and some were employed monthly for a fixed sum.

The average herd size was 60 animals; the average Fulani and Yoruba herds being 65 and 38 respectively (Table2). Fulani herds surveyed in the wet season were larger than those surveyed in the dry season. Yoruba herds surveyed in the dry season were larger but there were only 2 herds surveyed in the wet season for comparison.

Table 2: Size and composition of cattle herd according to type of farm and season

Farm type and season	Number of herds	Average herd size	Herd composition (%)		
			Adult male	Adult Female	Calves and young
Fulani	53	65	12.1	68.6	19.2
Wet season	32	71	13.3	71.6	15.1
Dry season	21	56	9.8	63.0	27.2
Yoruba	13	38	6.6	62.9	32.1
Wet season	2	28	10.7	66.1	23.2
Dry season	11	41	6.0	61.4	32.5
All farms	66	60	11.3	67.9	20.8

Size and composition of the cattle herd

The mean herd composition was as follows: 5.7 (9.5%) intact males, 1.1(1.8%) castrate males, 40.6 (67.9%) adult females and 12.4 (20.8%) calves and young up to 2 years. Both Fulani and Yoruba herds surveyed in the dry season contained a higher proportion of calves than those surveyed in the wet season, probably because many cows calved in the late wet season.

Herd sizes also varied according to nature of ownership of cattle, location of present and past settlement, duration of settlement, extent of seasonal movement and involvement in crop production (Table3).

Among the Fulani, herds owned solely by a family were larger than those owned jointly with others. Herd owners who came from another state had considerably larger herds than those who came from another location within the same state. Herd owners who had settled for a shorter period had considerably larger herds than those who had been in their present settlement for longer (the herd size decreased slowly up to about 10 years of settlement then dropped sharply). Herds which moved longer distances between

seasons were much larger than those which did not move or moved short distances. Herd owners who adopted mixed crop production had significantly smaller herds those who had not started crop production or those growing only one crop. In general, the size of Fulani herds decreased with longer periods of settlement.

Among the Yoruba, differences in herd sizes were also observed (Table3) but given the small size of the sample, it would be difficult to draw strong conclusions.

Table 3: Average herd size according to farm type and selected variables

Variable	Fulani		Yoruba	
	Number of herds	Average herd size	Number of herds	Average herd size
Cattle ownership				
Solely by family	28	74	4	45
Jointly with others	6	50	2	54
Not disclosed	19	55	7	31
Previous settlement				
Within present state	31	54	11	36
Outside present state	22	80	2	54
Duration of present settlement				
Under 10 years	33	81	7	35
10 years or over	20	38	6	43
Extent of seasonal movement of heard				
0-5km	45	55	12	39
Over 20km	8	120	1	36
Crop-production				
None	12	97	4	43
Single crop	6	85	–	–
Mixed crop	35	50	9	54

Breeds of cattle

Most herds included a mixture of trypano-susceptible zebus (White Fulani, Wadara, Gudali) and their crosses with trypanotolerant Muturu. Of the 37 herds with a record of the breeds of cattle, 9 had only Keteku (a cross between White Fulani and Muturu), 7 had Keteku and White Fulani, 2 had Keteku, White Fulani and Gudali, 5 had only Muturu (West African Shorthorn), 6 had White Fulani and Wadara, and 8 had Keteku, White Fulani and Wadara. Eighty per cent of the Yoruba and 84% of the Fulani herds included some Keteku or Muturu breeds. With longer duration of settlement, more herds included trypanotolerant Muturu and /or Keteku breeds (Table 4).

Herds with only or principally Keteku and Muturu were considerably smaller than those with principally White Fulani and/or Wadara. This is related to the fact that as the period of settlement increased, herd size became smaller and herd composition changed from pure zebu to a mixture of zebu and crosses between zebu and trypanotolerant breeds.

Table 4: Distribution of cattle herds according to farm type, duration of settlement and cattle breed

Farm type and duration of settlement	Cattle breed					
	Only zebu		Zebu, Keteku and Muturu mixed		Only Keteku and/or Muturu	
	No of herds	%	No of Herds	%	No of herds	%
Farm type						
Fulani	5	16	16	50	11	34
Yoruba	1	20	1	20	3	60
All	6	16	17	46	14	38
Duration of settlement (yr)						
Under 1	1	25	3	75	–	–
1-5	3	33	4	45	2	22
6-10	–	–	5	71	2	29
Over 10	2	12	5	29	10	59

Ownership of small ruminants

The ownership of small ruminants was widespread. The overall sample average was 9.8 animals per household, of which 59% owned both goats and sheep, 18% owned only sheep and 12% owned only goats averaging 15, 9, 2 and 5.3 heads per household respectively. Twenty percent had no small ruminants. All but 13 households owned poultry but none owned pigs. Out of the 13 that did not own poultry, 7 did not own goats or sheep either.

Table 5: Relationship between the number of cattle and of small ruminants per household

Cattle numbers	Number of herds	Number per household			Ratio sheep: goat
		Goat	Sheep	Total	
50+	26	3.9	7.3	11.2	1.9
30-49	16	5.1	6.5	11.6	1.3
Under 30	24	3.5	3.6	7.1	1.0

The number of small ruminants per household was around 11with cattle herds of 30 to 60 but was lower in households with fewer than 30 cattle (Table 5). The ratio of sheep to goats decreased with cattle numbers. This indicates that the more settled farmers had smaller cattle herds and small ruminant flocks. The proportion of sheep amongst the small ruminants decreased with cattle herd size and duration of settlement, perhaps because sheep move easily with grazing cattle but goats are more commonly left loose near the settlement.

Supplementary feeding of cattle

Supplementary feeding was not a common practice among the sample households (Table6). Almost one half of the informants gave no feed supplements. The remainder used salt lick (29%), and crop residues (23%). Only one said that he cut browse for his cattle. Out of 16 farmers who did not grow crops, 4 reported using crop residues as supplement, presumably obtained from local crop farmers (Table6).

Other characteristics

The survey indicated that Yoruba cattle owners usually owned land while Fulani and newly-settled Yoruba from another area normally obtained permission from the local chief to grow crops and build houses. Such permission was almost always verbal and could be terminated at any time.

Most Fulani informants (82%) claimed not to require permission from land owners for grazing animals. Disagreements with the local agricultural population were generally said to be few, 70% said that they had never had such disagreements, 25% that they had 'occasionally' and the remaining 5% 'very often'.

Table 6: Distribution of farms according to crop production and feed supplement for cattle

Crop production	Number of households	% of households giving feed supplement by crop production status		
		None	Salt lick	Crop residues
No	16	63	12	25
Yes	50	44	34	22
All farms	66	48	29	23

Over half of all the informants gave their main problems in cattle management as diseased and lack of good pasture. Others mentioned scarcity of water and uncontrolled bush burning. Only 2 informants cited conflict with landowners as a major problem, although 4 mentioned crop destruction as a subsidiary problem. When questioned about cattle health problems, 69% of informants mentioned specific diseases. Over half of these cited the combination of trypanosomosis, streptothricosis and helminthosis while the rest mentioned only one of these diseases. Other health problems mentioned much less frequently were tick infestation, rinderpest, myiasis and hygroma.

Eighty-seven percent of informants stated that they sold dairy products (milk, nono (sour milk) or cheese) regularly and dairy product sellers had a smaller herd size than non-sellers.

Sales of cattle were said to be "occasional" by 87% of the informants, while 14% had not sold any cattle in the past year. Forty-four percent of households bought one or more cattle during the past year and had a smaller herd size than those who did not buy. Combining buying and selling of cattle, it appears that 9% neither bought nor sold, 4.5% only bought, 47% only sold 39.5% both bought and sold.

DISCUSSION

The indicators of sedentarisation

Although in the past the humid zone was unsuitable for any trypanotolerant cattle production, it is clear that there is now a large, relatively settled population of cattle based permanently in the zone and that there is an no-going process of settlement. The various indicators of the extent of sedentarisation considered in this study showed a high degree of association with one another. For example, longer settlement was associated with less seasonal movement, higher degree of adoption of crop/mixed crop production and construction of more permanent housing. The results show a high degree of correspondence among all the indicators except housing.

The proportion of Fulani households with permanent houses appeared to be low because, in the survey, all housing that did not correspond to traditional Yoruba-type permanent structure was considered as temporary. This simple distinction between temporary and permanent structures might be incorrect. A 1982 aerial survey concluded that 70 to 75% of pastoral dwellings (rural habitation associated with cattle Kraals) in the derived savannah zone were permanent (RIM, 1988). In that study, either a rectangular mud-built structure or a traditional beehive shaped "ruga" was regarded as a permanent/semi-permanent structure; temporary structures were those made from a variety of lighter materials including branches, grass, crop residues and plastic sheets. It may also be noted that the Fulani were transhumant pastoralists and may prefer to retain their traditional "ruga" housing even after long settlement in one place. With these problems of definition, the percentage of permanent housing among Fulani was probably much higher than is reported in this survey.

Changes associated with sedentarisation

Fulani herd sizes recorded in the wet season were larger than in the dry season and although the data were collected from different sets of farms, it was assumed that the results would be the same if the same set of farms had been visited during the 2 seasons. However, in cases of large herd owners, seasonal differences in herd size could also occur due to a general practice of splitting the herd for grazing. RIM (1988) reported that this practice was confined to the dry season so as to make better use of limited and more scattered fodder and water resources, and that the mean size of grazing units was larger in the wet season. However, de Jode (1989) found, in the same areas as this survey, some herd owners practiced splitting in both wet and dry seasons.

System of management

A number of systems of management and ownership were found: the predominant one being the Fulani-owned herd managed by the extended family. In a small number of cases, Fulani herdsmen managed animals owned by Yoruba indigenes, usually on a caretaking basis, or Yoruba managed their own animals. Although the number of Yoruba cattle owners was small, their distribution indicated that moving from north to south of the derived savannah zone, new adopters of cattle may be found among indigenous

Yoruba, and of these some farmers may first employ Fulani herdsmen in order to learn the technique of cattle management, eventually taking up management themselves.

Those Fulani herds jointly owned were smaller than single family Fulani herds but jointly owned Yoruba herds were larger than single family owned Yoruba herds. Although the number of jointly owned herds was small in both the groups, the size pattern might indicate that as Yoruba cattle owners took up cattle management, they started with a smaller herd. The smaller size of jointly owned Fulani herds is not easy to explain, one possibility being that, as the extended Fulani family divided into nuclear families with a longer period of sedentarisation and as their divided herd sizes become smaller, some newly-formed families may use their cattle management expertise to manage Yoruba-owned cattle which are essentially fewer in number. Clearly more information is required on this evolving system of cattle management.

Crop production

A trend among the Fulani is that, with a longer period of settlement and adoption of mixed crop production, the herd became smaller. It was found that Fulani herds recorded in the wet season were larger than those recorded in the dry season and also larger herd owners did not engage in crop production, a wet season activity. Those who produced crops had smaller herds indicating the problem of competing labour demand for crop production and herding was resolved by keeping fewer animals. Yoruba crop growers had a slightly larger herd size than non-crop growers and these were mostly Fulani managed herds. Thus demand for labour for crop production did not pose any problem. It appears that large size herds came from the northern states but as the duration of stay in the south lengthened and as Fulani became involved in mixed crop production, the herds became smaller and less mobile between seasons.

Cattle breeds

Most of the cattle owned by the sample farmers were non-trypotolerant zebus but a shift toward local trypanotolerant breeds with longer periods of settlement was visible. Another recent survey has also reported a number of herds with N'Dama and Ketuku breeds (de Jode, 1989). Although the size of the present sample was not large and breed information unavailable for all 66 herds, there is an indication that in spite of the apparent decline in tsetse challenge in the derived savannah zone, sedentarised cattle owners have tried to reduce risk by breeding cattle which are inherently more tolerant to trypanosomosis. Since crossing with trypanotolerant breeds was found to be associated with longer period of settlement, it might be argued that tsetse challenge was still high when these farmers started settling and so there was then a stronger need for them to take precautions against tsetse. More recent settlers may need to adopt less of that strategy.

Feed supplements

In the northern states, nomadic Fulani cattle owners are generally granted permission by crop farmers to graze crop residues so that the farmers may derive benefits from animal droppings during grazing. Herders may also help farmers harvest their crop in exchange for crop residues (Kjenstad, 1988; Alhassan, 1989). This interaction is expected to change as both crop growers and cattle rearers become mixed farmers using their own residues. The low frequency of crop residue use reported by this present

sample of farmers is hard to explain. A recent survey revealed that first season residues (from crops grown in the first half of the wet season) were not always used due to the availability of better quality grass and the possibility of damage to second season crops. Second season residues were more widely used because available grass was then of lower quality and available in lower quantity (de Jode, 1989).

Further research will be required on how crop-livestock interactions evolve and develop in a situation of increasing sedentarisation. In particular, it is not clear whether Fulani rights over land, which is always owned by indigenes, could extend to the planting of trees, or even of forage legumes. A study in the sub-humid zone revealed that normally land owners do not allow the Fulani to use the same piece of land for a long period; fresh land is allocated after a few years, so that a right to land cannot be claimed (Kjenstad, 1988). More generally, there is a need to obtain further information about the several different patterns of migration, settlement and management as well as a more definite view about the pace of medium and long term changes in the zone, both in Nigeria and in other parts of West Africa.

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SEDENTARISATION DES ELEVEURS EN REGION DE SAVANE DERIVEE DU NIGERIA DU SUD-OUEST: RESULTATS D'ENQUETE

Résumé-Le but cette etude a ete d'evaluer le developpement et l'importance de la sedentarisation chez les Fulani, proprietaires de bovins de la zone de savane de Nigeria du sud-ouest. Les resultats, bases sur une enquete realisee chez 66 de ces proprietaires, choisis au hasard, montrent un developpement continu de la sedentarisation. Autrefois, les proprietaires de troupeaux parcouraient la region a la recherche du paturage de saison seche pues un nombre croissant d'entre eux se sont etablis et sont devenus agriculteurseleveurs. Generalement, la taille des troupeaux etait plus importante chez les eleveurs sedentarises recemment, mais avec les eleveurs installes entre les saisons et leur taille a diminue, et la proportion de fermes possedant des troupeaux mixtes zebus/bovins trypanotolerants a augmente. II est apparu aussi que quelques agriculteurs indigenes Yourba sont devenus agriculteurs-eleveurs en achetant du betail, en louant les services d'eleveurs Fulani pour leur exploitation, puis en reprenant leur gestion eux-memes.

SEDENTARIZACION DE GANADEROS EN LA REGION DE SABANAS DEL SUR-OCCIDANTE DE NIGERIA: RESULTADOS DE UNA ENCUESTA

Resumen-El objectivo de este estudio fue el monitorear el proceso de asentamiento de propietatios de ganaso blanco Fulani en la region de sabanas en el sur-occidente de Nogeria. Los resultados se basaron en una encuesta a 66 propietarios de ganado Fulani escogidos al azar, demonstrando estos que el proceso de asentamiento iba en progreso. Anteriormente los granjeros visitaban la zona para pastoreo en epocaseca, pero un numero creciente de ellos parece asentarse y desarrollar sistemas mixtos de produccion. Generalmente el numero de cabezas por hato era elevado al inicio del asentamiento pero a mayor sedentarizacion y actividad agricola, menor movimiento de ganado entre estaciones, menor cantidad de cabezas y mayor proporcion de ganado cebu/tripanotolerante. Se noto tambien qie algunos indigenas Yoruba no ganaderos, contrataron vaqueros Fulani para manejar el ganado recien comprado, empezando sistemas mixtos de produccion tambien. Luego, aprendieron a manejar su propio ganado.