THERIVER BASIN DEVELOPMENT STRATEGY AND THE INTEGRATION OF PASTORAL FULBE A CASE STUDY OF UPPER BEMUE RIVER BASIN DEVELOPMENT AUTHORITY

SUBMITTED TO THE POST-GRADUATE SCHOOL, AHMADU BELLO UNIVERSITY, ZARIA IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF M.Sc. RURAL DEVELOPMENT WITH SPECIALIZATION IN LIVESTOCK DEVELOPMENT

BY

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SEPTEMBER, 1987

DECLARATION

I hereby affirm that this Thesis has been undertaken by myself and that it is a record of my research work. It has not been accepted in any previous application for a higher degree. All the sources of information are specially acknowledged by means of references.

....

Signature Date

CERTIFICATION

This Thesis by Umaru A. Hassan, meets the regulations governing the award of Master's of Science Degree in Rural Development, Post-graduate School, A.B.U., Zaria and is hereby approved for its contribution to knowledge and literature presentation.

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DEDICATION

This work is dedicated to my beloved Parents.

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The agglomeration of several efforts which finally produced this Thesis document deserve acknowledgements. Although, these multi and divergent efforts by individuals and groups deserve more than a vote of thank, I still consider it a curtsy to advance such thanks.

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ABSTRACT

This research, sets to examine the effects and impact of Upper Benue River Basin Development Authority's programmes on the pastoral economy with a view to evolving an efficient integrative model and to propose a settlement plan for them based on the research findings.

Two hundred copies of Questionnaires were administered to 200 respondents. One hundred and fifty copies of a separate set of Questionnaire were administered to pastoral Fulbe while 50 copies of another separate set of Questionnaire were also administered to farmers. Descriptive, inferential statistical methods and "Time Series" to present analysis graphically were used in the data analysis.

The family was identified as the most important economic and socio-political unit of organization among the pastoral Fulbe. Production and consumption decisions are made within the family structure.

Two groups of pastoral Fulbe identified in the study area are the semi-settled and the nomadic Fulbe. While the semi-settled pastoral Fulbe split their herds for dry season herding, the nomadic Fulbe on the other hand move in total.

The River Basin Development Authority's land-use policy is found to be **incompatible** with pastoral **economy.**

Large scale farmers and Agro-Allied companies are taking over grazing lands thereby marginalising Fulbe.

The research further showed that, areas identified and planned for irrigation activities by the River Basin Authority are the traditional dry season grazing areas for the pastoral Fulbe. The Authority has neither plan for alternative grazing areas as the traditional grazing lands are being taken over nor has it plan for integrating them within the Authority's programmes.

Lack of title to land, water, and pasture are among several factors identified as responsible for constant migration of the pastoral Fulbe. Pastoral Fulbe are willing to settle if grazing facilities are improved.

Research findings also showed that no significant services have been rendered to the pastoral Fulbe by the Authority since its inception about 11 years ago. Instead, pastoral Fulbe are suffering increasing alienation from land and water resources, increasing conflict with farmers, emergence of new cattle diseases and/or increase in the existing cattle diseases.

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CHAPTER ONE

INTRODUCTION

Cattle rearing in Nigeria is concentrated in the hands of pastoral Fulbe who constitute about 90% of livestock owners in the country. The bulk of local meat supply (58%) and livestock products come from the herds of the pastoral Fulbe who employ mobility as a major strategy of production and resource management. Their system of husbandry relies mainly on free range natural grazing and crop residues which replace natural grazing as an alternative source of nutritious feeds during the larger part of the year (dry season).

The seasonal movements of the pastoral Fulbe in and out of their traditional grazing grounds in the sudan and sahel zones are determined by the duration of wet and dry seasons, the extent of farmlands under cropping and access to markets where dairy products can be sold and proceeds used for buying daily consumer goods. Therefore, movement in a predictable cycle has developed as the most effective method of exploiting the grazing resources, mainly water, natural fodder, crop residues, veterinary services, market conditions (Awogbade, 1980).

It is argued that the problem associated with the settlement of the pastoral Fulbe should be seen as one of the victims of the national forces of

change. There is ample evidence to show that their production system is entirely based on principles of internally regulated Savanna/Sahel/Sub-humid animal husbandry practices. However, contemporary winds of change in Nigeria have eroded this husbandry practice through decades of confiscation and appropriation of pasture lands by expanding agriculturalists, commercial ranchers and government agricultural policies which favour crop production. This is clearly manifested in the concept of River Basin Development Authorities and Agricultural Development Projects (ADPs). Indeed, what is happening today as far as settlement and integration scheme is concerned, is a clear indication of symptoms of pathetic neglect of the pastoral societies by various governments of Nigeria (Awogbade and Hassan, 1987).

1.1 Research Problem

Frantz (1978) notes that, previously unoccupied lands in Nigeria have increasingly come to be utilized by either pastoral or horticultural communities. The spatial expansion of farming has been facilitated by the ending of warfare and slavery, increased control over disease, the introduction of cash cropping 'hybridized' and new plant species, improvements in transportation, ever-increasing urban demand for food, the substitution of the plough for the hoe and the

adoption of oxen for draft purposes.

The conversion both of unused and former grazing lands, which has progressed furthest in Sokoto, Katsina, and Kano areas, has been the main cause of the south-eastward migration of the Pastoral Fulbe. They have also been forced to shift their grazing orbits or to become sedentary as a result of the construction of dams and waterholes, the establishment of forest reserves, the development of mining, and the growth of towns. For instance, as a result of the Kainji Dam on the Niger River, the water in the Benue and its tributaries now runs off more quickly. Consequently many streams dry up two months earlier than usual. This has made it necessary for pastoralists to find alternative dry season grazing zones, and have increased their contact and competition with riverine farmers.

According to Mortimore (1986), grazing rights are coming under increasing pressure. Open woodland grazing are diminishing with growing agricultural colonisation, and pastoralists cannot usually dispute such appropriations. Riverine pastures on which transhumant Pastoralists depend in the dry season are rapidly disappearing under dams and irrigation schemes. As grazing territories are rapidly encroached upon, pressure mounts on the remaining open rangeland, edible species are cropped out and productivity diminished; established patterns of mobility are dislocated and litigation

(particularly over crop damage by animals) is likely to increase.

Structural changes in land-use patterns are indeed quite discernible. The Green Revolution Reports (1981) and the various Reports of the Agricultural Development Projects (ADPs) and the River Basin and Rural Development Authorities(RBDAs) of between 1982 and 1985 all show sharp increases in farm plots. Increased cropping prevails around peri-urban towns and centres,whilst increased large scale mechanized farming are noted nationwide.

This does not really end here but rather, scramble for urban land has now extended seriously to rural land. Armed with the Land-Use-Act, Urban based developers are now able to acquire through, allocation or purchase extensive tracts of rural land. Land accumulation is growing rapidly by wealthy or influencial members of society, thereby denying present and future generations of their just claims and access to the strategic land resources of society. This socially unjust process of land acquisition will not only affect farmers but more seriously, the nomadic pastoralists who have no secure title to land. As individualization of land ownership continues, pastoralists would tend to be increasingly marginalized by farmers and large-scale livestock developers. This is the more reason why there is the need for settling of pastoralists. As

it is now there does not appear to be any 'coherent land-use policy or clear conception' of what future the Federal Government Plans to build for pastoralists.

In the past 21 years, Nigerian government policy has been centred on the establishment of grazing reserves so as to provide livestock owners with legal grazing rights and title to land. The reserves are yet to fulfil the goals for which they have been established. Inspite of land and infrastructure having been made available in some grazing reserves, it must be admitted that success in terms of numbers of pastoralist voluntarily settling is very limited and there are few signs of improved production.

Other than the present progressive expansion of cropland by farmers, the available grazing land may soon be acquired and fenced by individual livestock developers. Such a development would of course have serious implications for pastoral development. Disparities between the pastoralists and the farming population are likely to deepen to such dangerous proportions that tension and mounting social instability may become a serious characteristic of rural life in the savanna areas of Nigeria. This implies that while farmers' standard of living may be improving, the condition of their counterpart in the livestock sector, particularly the pastoral fulbe, would be worsening. The point being made here is that pastoralists have become increasingly

marginalised in the face of large-scale agricultural development and the establishment of cattle ranches by River Basin Development Authorities. Some of these ranches include the Mambilla (Yelwa) cattle Ranch, Cham cattle Ranch and Jama'are Cattle Ranch all within Upper Benue's jurisdiction. With these pressing problems, it is now a matter of urgency for land-use planning mechanisms to be evolved aimed at resolving the major conflicting demands for land use (Ologe, et al, 1981).

Thus, it is in the light of these ensuing problems militating against the pastoral Fulbe that it became necessary to explore means of resolving the land-use conflict between farmers/River Basin Development Authority and the Pastoral Fulbe. By so doing, it is hoped that, the two sectors (Agriculture and Livestock) will be integrated to benefit farmers and pastoralists thereby enhancing the livestock industry of the nation.

1.2 Aim of Study

The aim of the research is to examine the effects and impact of Upper Benue River Basin Development Authority's programmes on the entire life cycle of pastoral Fulbe with a view to evolving an efficient model of how the pastoral Fulbe can be integrated into the operative system of the River Basin Development Authority and to propose a settlement plan for them.

1.3 Objectives

The above aim may be achieved via the following objectives:-

1) Review and appraise the existing land policies within the area of study vis-a-vis the pastoral economy of the Fulbe;
2) To analyse the socio-cultural and economic settings of the pastoral Fulbe;
3) To establish the different types of seasons which exist in the area of study and to examine how these influence the migratory habit of the Pastoral Fulbe;
4) To identify and evaluate the Authority's proposed irrigation activities and to examine how these may affect the pastoral economies;
5) To evolve or design a model for the integration of Pastoral Fulbe within the jurisdiction of the River Basin Development Authority;
6) To recommend Policies and strategies for the implementation of the model in item five(5).

1.4 Hypotheses

1.411 Central Hypothesis:

That a 'planning error' was committed while establishing River Basin Development Authorities because the interest of Pastoral Fulbe was not taken into consideration.

1.4.2 Related Hypotheses

1. Grazing lands have increasingly become inaccessible to pastoral Fulbe;
2. The socio-economic life of the pastoral Fulbe has worsened;
3. The traditional Symbiotic relationships between the pastoral Fulbe and farmers are increasingly being eroded;
4. There is a steady increase in the incidence of cattle diseases particularly around flooded areas of Dams impoundments.

1.5 Scope of Study

Upper Benue River Basin Development Authority covers the whole of Gongola State and the entire eastern part of Bauchi State. Therefore, for any meaningful and precise research to be carried out within such a vast territory, two major irrigation projects(Mayo-Ine and Lower Gongola) of the Authority were selected based on the fact that pre-feasibility and feasibility studies of these projects had been completed by Ward Ashcroft and Parkman (Nig) Limited and G. F. Appio and Associates Consulting Engineers (Nig) Limited respectively. The existence of pilot schemes as fore-runners of the major schemes was also considered. It was noted that both projects were at a takeoff level as opposed to other projects whose reconnaissance surveys are yet to be completed. Since these projects may be operating along Rivers Benue, Gongola and Mayo-Ine,

it is believed that pastoral Fulbe visit the fadama areas of these rivers during the dry season for pasture and water. The selected projects form 35% of the Authority's existing projects. This is so, since projects such as Tallum irrigation project, Barre pilot farm, Borrong irrigation project, Kiri Dam and irrigation project and Gammadio irrigation project fall within area of study and were studied along with the major irrigation projects.

1.6 Mayo-Ine Irrigation Project(Ngurore)

This project is located within the Benue Basin and in Yola Local Government Area. About 6,000 ha rainfed cultivation is being undertaken by the Upper Benue River Basin Development Authority. The project will be expanded to 30,000 ha being the identified potential when fully operational. Farming techniques of traditional farmers would be improved since they constitute the target group of the project. Already, participating farmers are engaged in the Authority's rainfed agricultural activities. On the other hand however, are the pastoral Fulbe whose interest is yet to be incorporated into the programmes of the Authority.

It may be noted that, Mayo-Ine Irrigation Project joins the Dasin Hausa Multi-Purpose Irrigation Project on River Benue with identified Potential of about 150,000 ha stretching from Dasin at the Cameroun border (along the banks of River Benue) through Numan down to Lau in Karim Lamido Local Government Area. This area is noted for high concentration of pastoral Fulbe.

It is suspected that, almost all the pastoral Fulbe in the area migrate to the fadama areas of River Mayo-Ine and River Benue in search of pasture and water during the dry seasons. But these are the same fadama areas where the River Basin Development Authority plans to irrigate and cultivate about 180,000 ha of land without any consideration about the other fadama users (pastoral Fulbe). Since the ultimate aim of the Authority is to distribute irrigation plots to participating farmers, this will no doubt escalate friction between farmers and Pastoral Fulbe.

1.7 Lower Gongola Irrigation Project

This is also one of the major irrigation projects within the River Basin Development Authority's schedule (Plan Proposals). The project is situated along the Gongola Basin in Guyuk Local Government Area. This project would be drawing its water from Dadin Kowa Dam when completed later this year. Closely sited are also the Tallum irrigation project, Kiri Dam and Irrigation Project and Borrong/Barre Irrigation Project. All these were studied along with the Lower Gongola Irrigation Project. A gross area of over 30,000 ha has been identified and planned for irrigated agriculture by the River Basin Development Authority and Savanna Sugar Company. The area is also densely populated with Pastoral Fulbe. The fadama areas of the Gongola river earmarked for

irrigation activities by the River Basin Development Authority also form dry season pasturing and watering areas for the Pastoral Fulbe.

1.8 Methodology

The following methods of Data collection were employed:

1.8.1 Primary Data Sources:

Questionnaire: Two separate sets of Questionnaires were administered in the study area. One set was administered to Pastoral Fulbe in the study area while the other set was administered to farmers in the same manner.

In all 200 copies of Questionnaires were administered to 200 respondents in the following manner:

(1) 50 copies of questionnaires were administered to farmers. One quarter (25%) of the 140 resident participating farmers were randomly sampled in Mayo-Ine Irrigation Project giving a total of 35 respondents while 15 respondents were also randomly sampled in Lower Gongola Irrigation Project representing 25% of the 60 participating farmers in the project.

(2) 150 copies of a separate set of questionnaire were also administered to Pastoral Fulbe. The distribution of the copies of questionnaires was proportionate to the population obtained

in each of the two irrigation projects. A total of 200 pastoral families were recorded in Mayo-Ine Irrigation Project and 275 pastoral families in Lower Gongola Irrigation Project with a cattle population of about 12,000 and 22,000 respectively. In the light of this, 32% (63 respondents) of the 200 pastoral families in Mayo-Ine Irrigation Project was randomly sampled and the heads of household interviewed. Similarly, 32% (87 respondents) of the 275 pastoral families in Lower Gongola Irrigation Project was randomly sampled and the head of the family in each sample interviewed. Therefore, it is now clear that, 32% of the 475 pastoral families in the study area was randomly sampled and household heads interviewed.

1.8.2 Interview:

Five members of the Authority's management staff (including the General Manager), two Project Supervisors and seven extension workers were orally interviewed during the study. Also interviewed were the Chief Veterinary Officer, Chief Agricultural Officer, and two Veterinary Field Officers all staff of the Gongola State government.

1.8.3 Secondary Data:

a) Records from Upper Benue River Basin Development Authority such as feasibility and Pre-feasibility

studies, periodic reports, plan documents and maps were duely consulted.

b) All relevant but available documents with Gongola State Government, Yola, Guyuk and Numan Local Governments, Federal Livestock Department and National Livestock Projects Department (NLPD) were consulted.

c) Relevant Publications and other materials mostly from Libraries were used.

1.9 Sampling Procedure

Two lists comprising 275 and 200 pastoral families were collected from Guyuk and Yola local governments respectively. These were further confirmed by Numan Zonal Veterimary Office and Livestock Unit Mayo-Ine Irrigation Project. On this basis, names for each project were listed and numbered. Through this process, a table of random numbers was acquired and the researcher then randomly picked one number at a time until 87 names were recorded for Lower Gongola Irrigation Project and 63 names for Mayo-Ine Irrigation Project. This gives the total number of pastoral Fulbe interviewed to be 150. Each Ardo in the study area was then consulted in order to identify people under him and subsequently either led the researcher or a guide led him to the various camps where head of households were interviewed.

Similarly, two separate lists of farmers were

collected from project supervisors of the two projects and same procedure as above was applied. For the 140 participating farmers in Mayo-Ine Project, 35 were randomly picked and interviewed. Fifteen numbers were also picked from a table of 60 participating farmers of the Lower Gongola Irrigation Project giving a total of 50 farmers. Some of the farmers were interviewed at their farm sites while others were traced to their homes.

Random sampling technique was preferredin selecting respondents so as to give each respondent equal opportunity in being selected thus avoiding any biases that might likely be introduced. However, no special technique was used in selecting extension workers, Authority's Management staff and officials of the state government. Relevance of those interviewed to the subject matter was given consideration rather than using a specific technique. For instance, the researcher considered interviewing Veterinary Officer from state ministry of Agriculture more important than interviewing a permanent secretary in the Ministry of Justice. On the other hand, extension workers were so few that, using a sampling technique would not make any meaning.

1.10 Data Analysis

Descriptive and inferential statistical methods were used in the data analysis.

Descriptive statistics is preferred because of

the range of data which spread over the study area and also for the responses recorded which actually called for the derivation of means or averages, modes, medians and Standard Deviations.

Since the entire population of the study area was not covered, and sampling method was adopted, inferential statistical method was used on the information (data) gathered from the field to infer on the whole population within the study area.

Time'series' to present analysis graphically was also used.

1.11 Limitations Of The Research Methodology

There is no doubt that no research work could claim perfection but rather a degree of accuracy is acceptable.

Among other limitations of the methodology of this research is in the area of sampling procedure. Although respondents were randomly selected, but in some cases the researcher could not trace them but instead substituted them with their neighbours who were not randomly picked for interview. The nature of the pastoral practice makes it difficult to locate respondents. The dispersed nature of Pastoral Fulbe camps was in itself a limitation in the sense that other than the difficulty involved in tracing the exact locations, it was also time consuming. Another important limitation is the time factor which was

really inadequate. Non availability of some important secondary data such as base maps and land-use maps is also a limitation to this study. There was the problem of lack of clear perception of issues by respondents despite repeatitive explanation by interviewers thereby resulting into inaccurate reporting by such respondents.

1.12 Background To The Study Area

1.12.1 The Physical Parameters

Location: Fig.I Shows the study area. Within the study area, Mayo-Ine Irrigation Project is situated 25 Km from Jimeta along Numan road. It covers about 30,000 hectares and lies between the Benue River in the North and extends beyond Wuro-Hausa and Kaljang where the Dulumi Dam would be sited in the South. It is bounded on the east by the Mayo-Ine River and on the West beyond Bobbore (see Fig.2).

On the other hand, the Lower Gongola irrigation Project (Guyuk Lot) is lying on the right of the Gongola River, after its confluence with River Hawal. The project consists in a stretch of land from 2 to 10 km wide, running parallel to the river. Its phase one boundaries are the river on the one side and on imaginany line joining the villages of Bobini, Guyuk, Lokoro and Gunda on the other. The southern boundary is another imaginany line passing between Gwalura and Gunda to the west and Kwadadai and Gugu on the east. Second phase of the project is on the other side

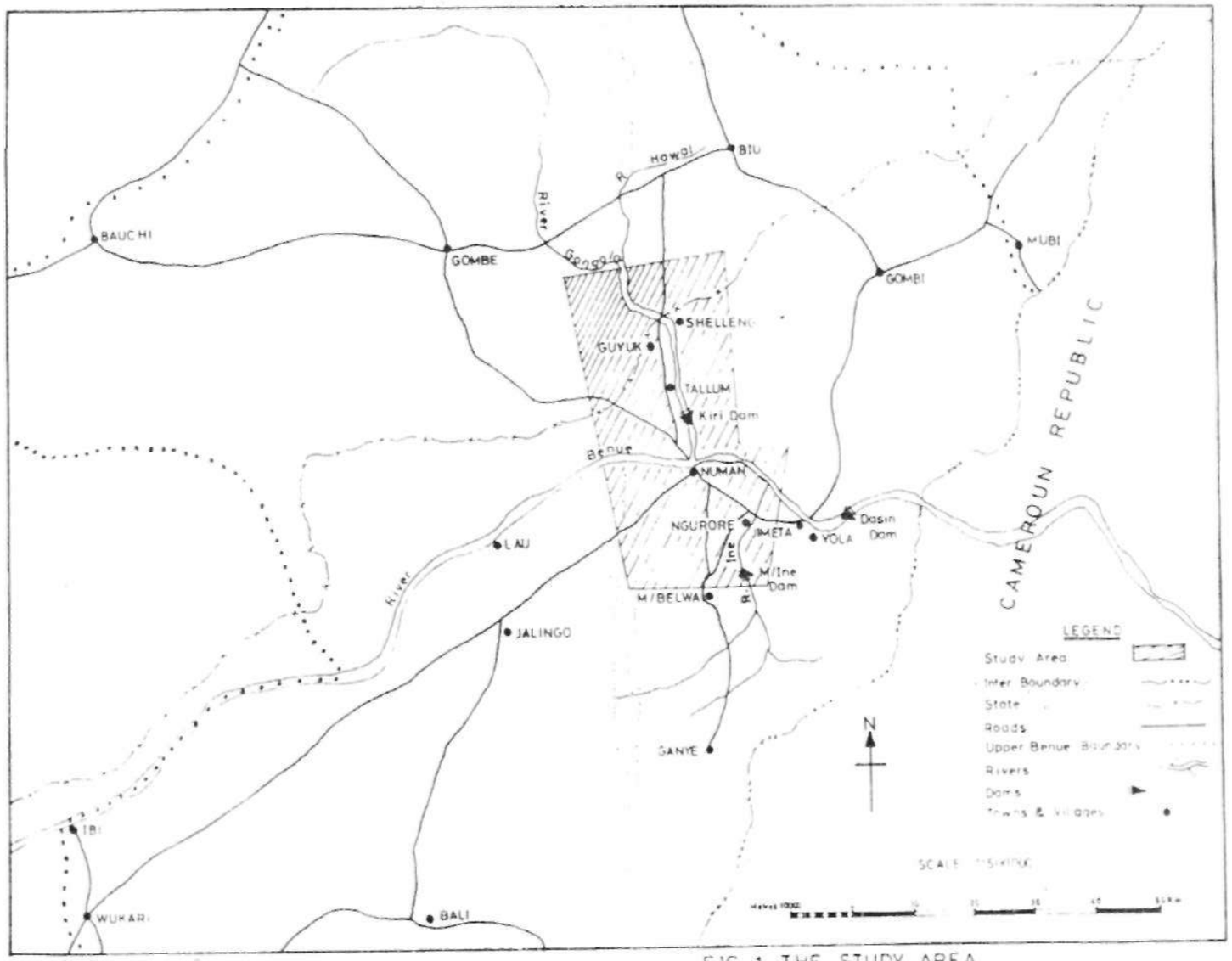


FIG. 1 THE STUDY AREA

SOURCE

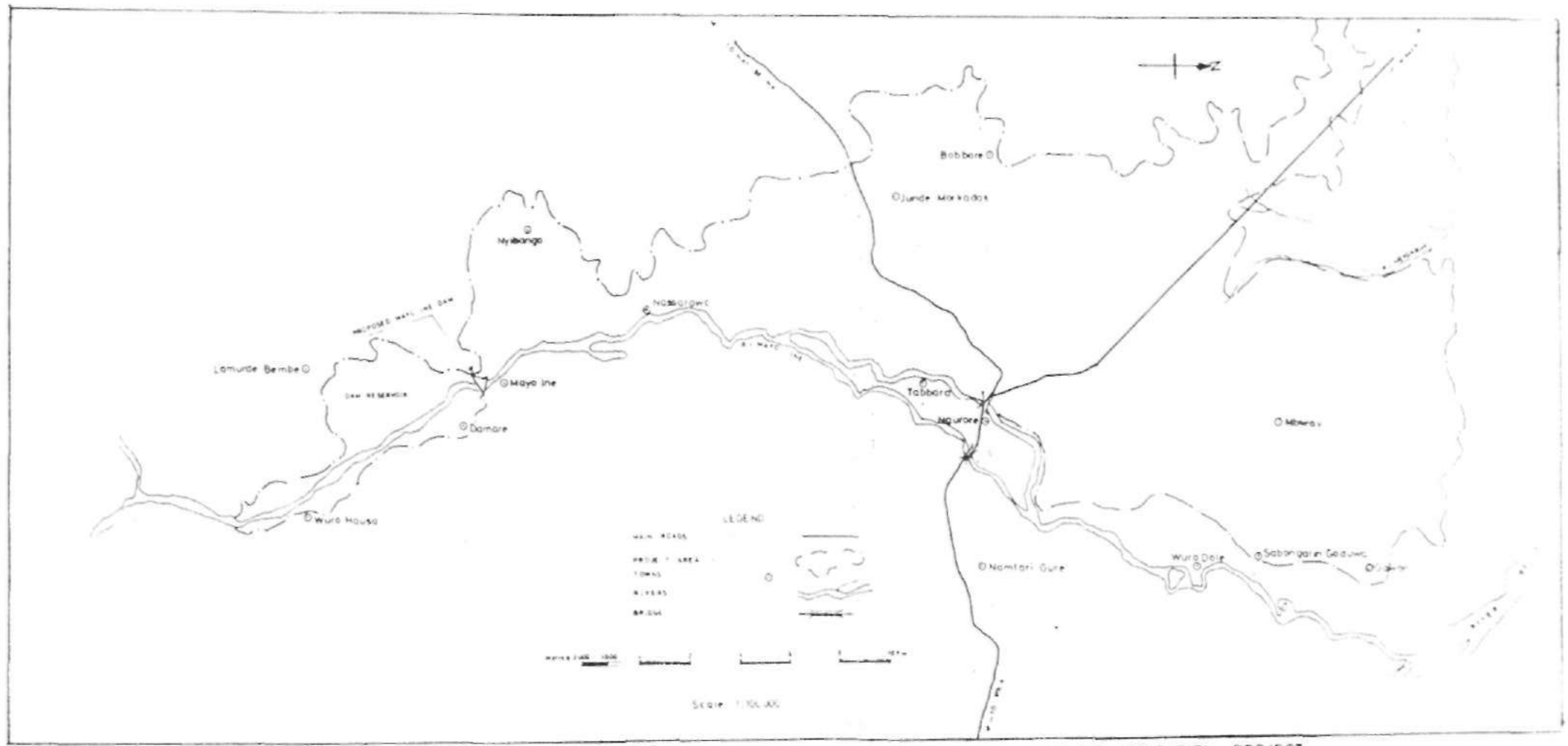


FIG. 2 LOCATION OF MAYO INE IRRIGATION PROJECT

SOURCE Ward, Ashcroft and Parkman (Nigeria) 1978

of the river bank. A new asphalted road crosses the project area from one end to the other providing easy access to the left bank or the Gongola River and to the towns to the north, up to Biu (see Fig. 3).

Geology: The major part of the project area is underlain by Bima sandstone which consists of thick beds of coarse felspathic sandstone which have been deposited under continental conditions. Bima sandstone is of cretaceous sediments in the north-east of Nigeria and rests on Basement complex rocks. The sandstone forms undulating land and small ridges with localised rock outcrops (Electrowatt Consulting Engineers and Planners (Nig), 1980).

Volcanic rocks of tertiary to recent age provide the present materialsfor substantial proportion of soils in the area. They form conical hills, which can be upto 70m high and basalt lavas which usually give rise to flat to gently sloping land. The basalt are fine-grained, dense and olivine-bearing and show little variation in appearance and composition (Ibid).

Geomorphology: The area is composed of upland plain and flood plain. The area can be described as a rolling or gently undulating plain and includes some units of flat and gentle connecting slopes. Marked differences in relative relief occur only on some sandstone formed ridges, basalt hills and flat topped cuestas. The general slope tends towards the Mayo-Ine, Benue and Gongola flood plains and is very

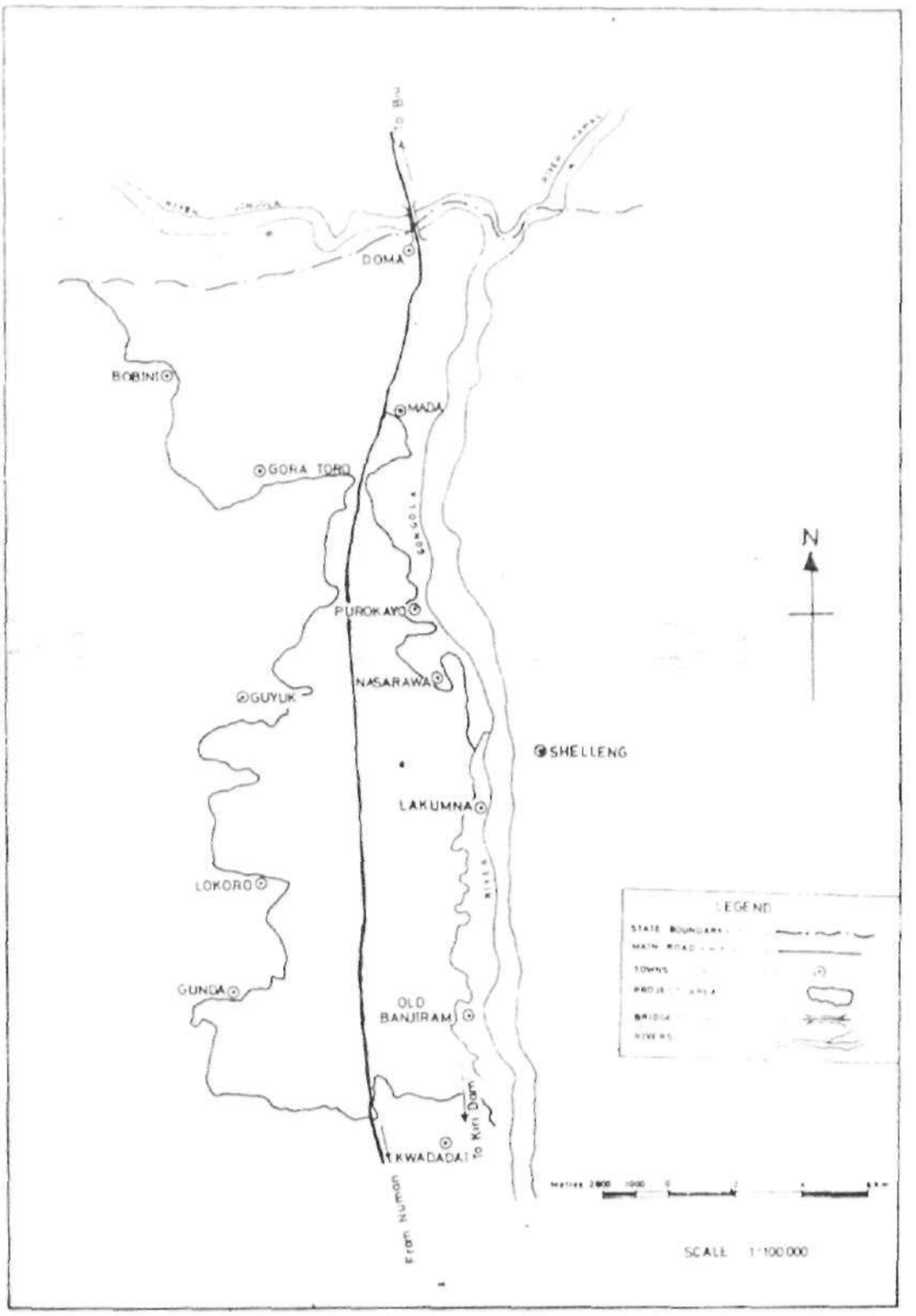


FIG. 3 LOCATION OF LOWER GONGOLA IRRIGATION PROJECT (GUYUK LOT)

SOURCE: Upper Benue, 1984

gradual ranging from 0.5 percent to 2.0 percent. Topographically, the lowest lying areas are the flood plains at about 150m and the highest part of the upland plain at about 200m (ASHCROFT & PARKMAN, 1978).

The upland plain is dissected by various incised streams. Two wider flat alluvial tracts forms low angle alluvial fans on entering the flood plains.

Climate: The climate of the study area can be classified as a tropical climate with three to four humid months and maximum temperatures above 33.5°C.

The consequential seasonal movement of the intertropical convergence zone forms two clearly divided seasons. The rainy season, which lasts in the area 160 to 170 days i.e. during the period May to October and the dry season, which occupies the rest of the year (G.F. Appio and Associates, 1982). The major rainfall peaks occur in July, August and September, where the frequency and the amount of precipitation become regular to the extent that there is surplus over evapotranspiration demands, which rapidly replenishes the soil water deficit.

The highest mean monthly temperatures occur in the period from February to April, ranging from about 27°C to 32.9°C (Ibid). This is interrupted in May by the onset of the first rains. During the rainy period the minimum temperatures are fairly steady reaching values of about 22°C, whereas the lowest

values are recorded in December and January during the Harmattan winds.

The value of the average relative humidity varies from 17% in February to 77% in August. The monthly minimum (at 15.00 hours) is about 13% and maximum monthly values may fall to below 10%, while the maximum may rise as high as 85% (Upper Benue, 1982).

The records of sunshine duration show the lowest values to be from 4.6 to 5.4 hours per day during the humid months, and the maximum . 8.3 to 9.3 hours per day in November, December, and January. This yearly variation depends largely on cloudiness and does not denote a variation of radiation which is minor during the year. The period of maximum radiation over the study area corresponds roughtly with the rainy season, ranging between 870 and 897 cal/cm^2 per day, while the minimum of 750 to 732 falls into the period from November to January(Ibid).

Available records on wind run in the study area show certain discrepancies which may be caused by differences in altitude and topography. For instance, in the north-south oriented Lower Gongola, Benue, and Mayo-Ine Valleys, the winds are more frequent than in other places within the same study area.

The average annual evapotranspiration over the area amounts to about 1500 mm (Ibid). There are two distinct maxima in the yearly distribution

occuring before and after the rains, and two minima in August and December.

Soil: The main types of soils have been identified in the area as shown in table 1.1

Table 1.1: Percentage Distribution of Soils

Soil Type	Percentage(%)
Lithosols	4.62
Regosol	25.82
Cambisol	9.35
Acrisol	10.43
Vertisol	30.80
Gleysol	3.98
Fluvisol	15.00
Total	100

Source: Electrowatt Consulting Engineer and Planners (Nig), 1980.

Vertisols and Regosols are generally the most common followed by flurisols, Acrisols and Cambrisols. The minor soil categories are Gleysols and Lithosols.

Most of the soils are slightly alkaline and tend to be deficient in phosphates, but overall the soils of the area are potentially fertile and irrigable.

Vegetation: The area belongs to the sub-sudan region as transitional belt between Northern Guinea savanna and sudan savanna. The present physiognomy of vegetation in the area is largely affected by

man's activities.

Savanna Woodland, with more or less dense conopy of trees and shrubs cover only 3.6% of uncultivated land. The encroachment of cultivation into areas with better soils has suppressed the woodland mainly into areas with heavy soils, formerly avoided by man. On such sites Acacia Seyal savanna woodland predominates.

On Bima hills and over permeable soils in cretaceous sediment region Afrosmosia and Combretum SPP. are very common in the woodlands. The deep, well drained soils in the alluvial region are usually dominated by Anogneissus/Acacia SPP. communities (Ibid).

In less protected areas where grazing and felling lead to considerable selection and reduction of vegetation, the savanna woodlands altered to dense tree savanna. Two types of dense tree savanna reflecting the impact of man and his livestock can be distinguished:

a) Dense tree savanna in traditional grazing areas on alluvium as an example around Jumbul;and
b) Dense tree savanna in areas with higher level of shifting cyclic cultivation, occupying mainly the uplands.

The composition of trees depends primarily upon the type of savanna woodland from which it originated. The most common variants are Acacia

seyal/Anogeissus leicocarpus on heavy soils and Afrormosia/Detarium, with marked increase of leguminous trees on well drain soils (Ibid).

Open tree savanna is defined here as a coherent complex of primary and secondary vegetation that is largely influenced by man, but presently uncultivated. It must not be confused with savanna parkland which indicates areas with a higher cultivation density.

Secondary schrub regrowth varying in height, and a variety of dry schrubs, mixed with trees upto 6 - 8 m tall, already dominates the physiognomy. The pioneer species dominating early fallows are piliostigma thoningii casia singueana and ziziphys SP.

Shrub savanna forms very diffuse boundaries to the open tree savanna on heavy soils. The density of schrubs is here very high in contrast to the dry shrub savanna over permeable soils. Higher growing trees occur only occasionally.

In the southern parts of the study area the Terminalia/Combretum SPP variant is still common, whereas in northern lying parts of sudanian species such as Guiera Senegalassis and combretum gentinosum indicate drier conditions (Ibid).

Periodically flooded areas or areas with compacted alluvial soils (e.g. swore series) are dominated by tall grasses, interspersed by herb

vegetation. Shrubs only occur on higher elevated or disturbed sites.

Back swamps, channels and ox-bow lakes are often covered with floating aquatic vegetation. The surrounding areas, with water logged soils, are covered with low grasses and marshy vegetation.

Areas of the main vegetation complexes are shown in Table 1.2.

Table 1.2: Areas of Main Vegetation Complexes

Vegetation	Hectares	% from uncultivated Area
Flood-Plain Grassland	13,443	18.6
Swamp Vegetation	3,664	5.1
Shrub Savanna	21,822	30.3
Open Tree Savanna	6,597	9.2
Dense Tree Savanna	23,857	33.1
Savanna Woodland	2,645	3.6
Total	72,028	100

Source: Electrowatt Consulting Engineers and Planners (Nig), 1980.

1.12.2 Socio-Economic Parameters:

Human Resources: Indeed, knowledge of the size and structure of the population of the study area is one of the basic parametres required in order to evaluate the project in both qualitative and quantitative terms. The resident population of the study area can be estimated at about 87,000 persons,

whereas a total of about 110,000 persons gravitate around the area. About 80% of the total resident population is concentrated in the villages with the remaining 20% living in scattered dwellings. (ASHCROFT & PARKMAN (Nig), (1978).

For the estimated 87,000 persons living within the area, 79,000 or about 90% are farmers and/or livestock raisers. The remaining 10% carry on other activities. Out of the 79,000 persons, 58,000 practice only farming while the other 21,000 carry on either mixed activity (farming and animal husbandry) or sole animal husbandry (Ibid).

Agriculture: The farmers in the study area commonly grow crops such as sorghum, rice and maize. Rice and maize are usually grown on the fadama and sorghum on the upland. Other crops grown are groundnut, cowpea, cotton, tobacco, sweet and bitter cassava, bambara nuts, millet, sugar cane, coco-yam and sweet potatoes. Some farmers also grow tomatoes, onions, peppers, sorrel, amaranthus and okra on small shadoof-irrigated plots on the Mayo-Ine, Benue and Gongola flood plains. Mango, guava, banana and citrus trees are also found on the edges of the flood plains.

The first crop planted is usually maize in the fadama land after the first or second rain. This is usually followed by sorghum on the upland after the second or third rain. Rice is usually planted in the fadama after weeding of maize, either as an intercrop or on those parts

that are more heavily inundated later in the season. Groundnuts and cowpeas are planted on the lighter upland soils at about the same time as sorghum, cowpea usually as an intercrop with sorghum and groundnut more as sole crop. Cotton and tobacco are not planted until the farmers are certain that their flood crops are safely established.

Livestock Keeping: Nearly all the seetled farmers in the area have livestock of one sort or another, though not in great numbers. Among small ruminants are goats, sheep and pigs. The livestock that dominates the whole area are the cattle herds of the Pastoral Fulbe. Their herds freely graze all over the area. Although, the lower upland areas nearer rivers Gongola, Benue, and Mayo-Ine are being heavily cultivated, the number of Pastoral Fulbe. in the area has, according to all accounts, increased greatly. In the dry season they graze the flood plains of these rivers and allegedly damage dry season crops of the settled farmers living just above the flood plains. Although, there is some grazing of the higher land but cattle must come to the flood plain daily for water.

Forestry: There are no forest reserves or afforestation programmes in the study area. The wood of savannah woodlands is therefore intensively used locally as firewood and timber.

CHAPTER TWO

LITERATURE REVIEW

2.1: Land Use and Pastoralism

Land-use competition between animal husbandry and arable agriculture is often intense in the sudan and sahel zones which also carry some of the highest densities of human population in Nigeria. At best, the cattle rearer and the sedentary agriculturist have established a symbiotic relation in which the pastoralist helps in providing manure to the farmers' fields (especially during the early dry season) as he grazes his animals on the crop residues.

Formerly, crop residue grazing after harvest formed an important feature of the symbiotic relationship between herders and the cultivators with mutual benefits of both parties. However, where access to crop residues is allowed, herders now commonly pay for the privilege of using the residue. In fact, through the centuries, a set of rules has evolved for "Pasturing cattle on stubble and fallow land and for guaranteeing cattle tracts and the use of water supplies" (Mortimore, 1978, and Awogbade Op. Cit). Since crop damage by cattle has often led to litigation triggered off by physical conflict in which dangerous weapons have been used, it is quite obvious that farmers in most

areas are beginning to see the pastoral Fulani as a serious threat to their livelihood.

Indeed, there is a basic problem with the present animal husbandry practices and the rights of nomadic Fulani who own most of the animals. While grazing rights tend to be communal, farming rights are becoming increasingly individualized. Moreover, there has been progressively extension of cultivation areas into the traditional grazing areas without concern for the preservation and development of grazing land, as depicted in Fig. 4, for the years 1951, 1976, and 1986. This has led to conflicts between pastoralists and crop producers, but while the courts could award farmers damages for the destruction of their crops by cattle, there seems to be no concern for the need to protect cattle routes from being converted to farms. This begs the important question of what access to land and pasture pastoralists will have in the future (Ega, 1984).

Awogbade (Op. Cit) has also noted that, land utilization in Nigeria is undergoing rapid and far reaching changes. If this situation is not arrested through government intervention, a gloomy future for the landless nomadic herders could be predicted. This will also result to a poor future for meat consumers of this nation. It is now quite clear that, uncultivated grazing lands which were once the preserve of nomadic herders have decreased from 67% in 1951 to 50% in 1976. A further decrease of 39% has been

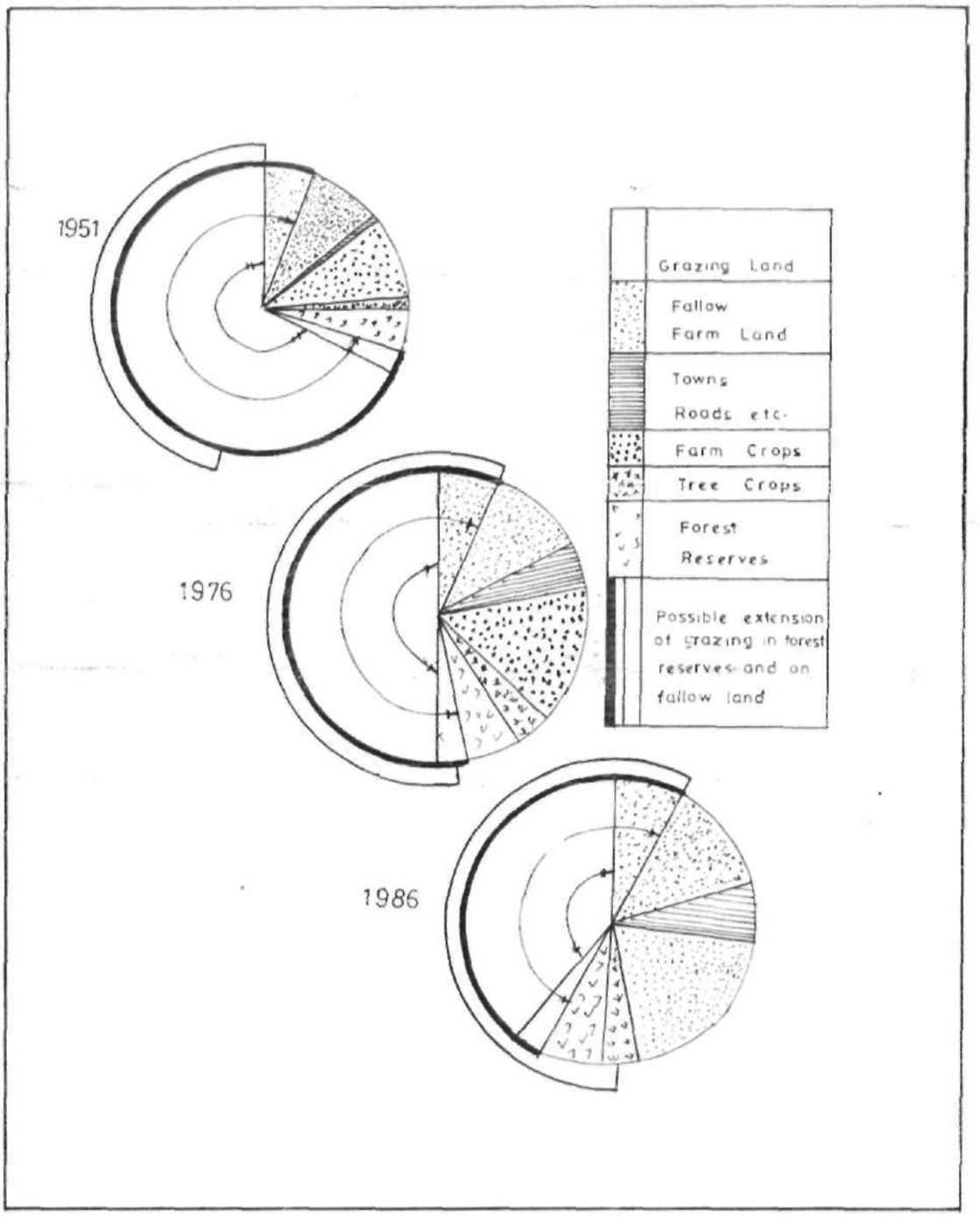


FIG. 4, LAND UTILIZATION IN NIGERIA

Adapted from L.A.EGA 1984 Estimate was based on Federal Department of Agriculture Statistical Series FDA/PLD/2. In calculating areas required by cattle for year round grazing, 6 hectares per head have been allowed as a reasonable average for the whole country. Estimated cattle population for 1951 is 7 million and for 1976 is 9 million with no increase up to 1985 The total land area is 92,377,271 hectares.

predicted for 1986 (see tables 2.1 & 2.2). From past experience, this type of situation may lead to loss of natural vegetation cover, the itensification of erosion and desert encroachment and over stocking of the existing grazable lands.

TABLE 2.1 LAND UTILIZATION IN NIGERIA FOR THE YEARS 1951, 1976 AND 1986

Category of Land	Cattle Population (7million) 1951	Cattle Population (9million) 1976	Cattle Population (9million) 1986
Uncultivated rangeland Primarily used for livestock	67.0%	50.0%	39.0%
Fallow farmland 40% of which is usable for grazing	13.8%	17.0%	20.0%
Non-agricultural land, including towns, roads and airports etc.	1.0%	5.0%	7.0%
Land under farm crops	9.4%	15.0%	20.0%
Land under forest reserves, 33% of which is usable for grazing Mainly in the North	7.6%	10.0%	10.0%
Land under tree crops	1.2%	3.0%	4.0%
Total	100%	100%	100%

Source: Adopted from M.O. Awogbade, 1980

TABLE 2.2 GRAZING LAND POTENTIALS FOR CATTLE IN NIGERIA: 1951, 1976 AND 1986

Category of Land	Cattle Population (7million) 1951	Cattle Population (9million) 1976	Cattle Population (9million) 1986
Percentage of the land area required to feed cattle population with 6 ha per head	45.0%	58.5%	58.5%
Percentage of the land area available, including entire area of uncultivated bush, 40% of forest reserve.	78.8%	60.1%	50.3%

Adopted from M.O. Awogbade, 1980, 1981

Baba (1986), noted that, conflict in Land-Use between arable farming and pastoral nomadism in Nigeria, as elsewhere on the continent, is basically a systemic one, arising from differences in the perception of land resources, the institutional tools for utilizing the land resource base, and the very processes of land utilization between the two economies.

Generally speaking, crop cultivation (arable farming) is largely undertaken by small farmers. For the fact that crop cultivation requires "close attachment of the producer to the land" this in effect results in the claim of the ownership of the piece of land being cultivated both at the level of individual and the community. Therefore, it is rightly pointed out that, crop cultivation is guided by a wide "array of tenural arrangements" which define rights of use and restrictions of access to the land(Ibid).

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On the other hand, Pastoralism which is concentrated in the hands of Fulbe in Nigeria, is a system characterised by extensive land-use. Under this system, there are no land rights what so ever. In view of the fact that, this system depends largely on natural fodder, the relation between the Fulbe and the land is that of exploitation since no imput is ever applied to the land for improvement. This situation is reflected in the constant movements of the pastoral Fulbe insearch of better pasture, and water. It is however, believed that, the existence of an ample land gives room for the co-existence of the two economies. That stage was conceptualized by Baba (Ibid) in Fig 5A as one in which the spatial separation of the two land-use systems is highly possible especially during the growing season. Pastoralists easily recognise and stay away from cropped land until harvest is completed and their presence may be welcomed by the cultivator for the need of manure to replenish the soil. As population from farmers and pastoralists expands, pressure on the land resources also increases. Arable farmers, in particular, would make it increasingly difficult to spatially separate the two land-use systems during the critical seasons and a stage of occasional clashes as depicted in Fig. 5B may develop into a stage of frequent clashes and generally social instability (see Fig. 5C), depending on the degree of presure (Ibid).

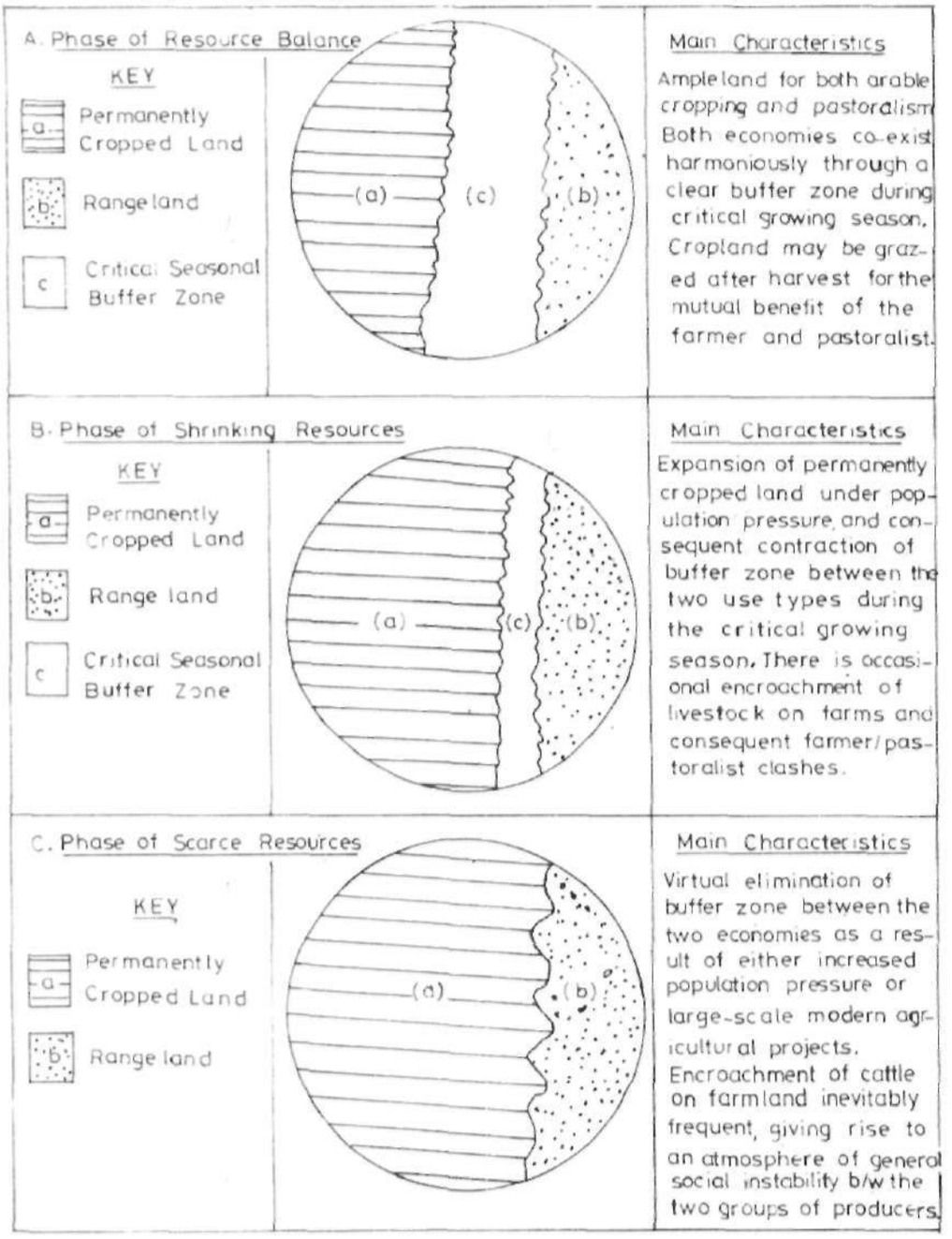


FIG. 5 IDEALIZED STAGES IN THE EVOLUTION OF CONFLICTS BETWEEN ARABLE FARMING AND PASTORAL NOMADISM

Adapted from J. M. Baba, 1986.

In the light of the foregoing, it is quite clear that relationship between farmers and pastoralists is worsening in several areas of this country. Many agricultural activities have been noted in the recent past to have reduced the "resource base" at the disposal of pastoral Fulbe thereby accelerating conflict between the two users of rural land (Ibid). These agricultural activities are worthy of note.

a) It has been observed that, rapid population growth, technological changes which include adoption of fertilizers and increasing tractorization of farm operations are responsible for fast expansion of cropped land.

b) Development of large-scale projects such as Agricultural Development Projects(ADPs) and River Basin Development Authorities(RBDAs) whose technological packages have led to the expansion of cultivated land are alienating land from pastoral use.

c) Closely related are the "new breed" within the agricultural sector such as urban based elites, retired military personnel, and retrenched or retired civil servants who have open large areas of land for agricultural purposes thereby tampering with grazing lands.

d) The introduction of modern irrigation system where traditional farmers practised the new form of cultivation during the dry season on fadama lands is posing further threat to the

souring relationship between farmers and pastoralists. This clearly reduces such lands from the normal dry season grazing by the pastoral 'Fulbe'.

Gefu (Op. Cit), observed that, pastoral activities rely heavily on pasture utilization and grazing land may not be readily available to pastoralists as they do not often have title to land. Both pastoral and agricultural producers compete for fertile land to support their agronomic and pastoral activities. According to him, if this competition is not mutually contained it could build a relationship of antagonism. However, a continued atmosphere of rift between pastoralists and agricultural peoples for access to and control of land and water resources especially in northern Nigeria may be an indication of potential setback of sedentarization especially in the absence of a well formulated and well administered land reform. Since pastoralists do not usually have rights of land ownership, they must depend on the hospitality and goodwill of the agricultural communities to gain access to the use of community resources. If government policy must aim at settling nomadic pastoralists it is imperative that land reforms be simultaneously embarked upon such that problems associated with land-use by both pastoral and agricultural peoples would be minimized. The magnitude of the land problems has been clearly stated in Frantz's comments about the pattern of land-use of pastoralists in Donga-Mantung and

Mambilla communities in Cameroun and Nigeria, respectively. Frantz (1980), observed that crucial problems concerning land-use and land tenure remain to be worked out in Nigeria and despite all efforts of government to step up production, livestock production is still inadequate to fulfil either the goals of governments or demands of consumers.

Although the Nigerian government seems to be aware of the bottleneck posed by the land tenure system which works more against nomadic pastoralists, not much has been done to effectively tackle the problem. The recent Land-Use Act which vested all land in the hands of state has hardly been enforced. Even though the government under the Act, is said to have the sole power and right of allocating land for various uses, this law has hardly been enforced to the extent that nomadic pastoralists in the country cannot have free access to and use of land for livestock production activities. The reality of the matter is that land ownership and the exercise of use right is still practically in the domain of local communities and individuals. Sendentarization (with or without adequate land reforms) is bound to greatly affect the future of pastoralists as well as the future of the livestock industry.

2.2 River Basin Development Strategy

Right from the dawn of history, civilisations have been known to exist and flourish around river

valleys. Typical examples are the Nile Valley in Egypt, the Tigries-Euphrates valley in Mesopotamia, the Indus valley in India, the Yangtse and Hwang-Ho valleys in China. During the Early and Middle Ages, rivers influenced the development and growth of settlements and location of towns. In England, this feature is illustrated in the siting and naming of towns at road-river crossings and spread outward away from banks. Towns such as Oxford, Cambridge, Bedford, etc. exemplify this feature. The development of many ancient and modern towns and settlements must be said to be synonymous with river valley and water resource colonization and improvement (Olayide, etal, 1979).

As a geographical entity to promote regional development, the first major river valley development scheme is the Tennesse Valley Authority (TVA). The scheme seeks to perform four important functions in the development process. First is river control achieved by the construction of twenty-seven dams of which nine are on the main river and these are designed to facilitate flood control, enhance navigation and supply electric power. Second is land improvement through fertilizer production for exhausted farmlands, reclamation of eroded lands, and demonstration of modern methods of plough - planting crop selection in established demonstration. Third is the provision of irrigation water as well as adequate water for domestic and non-domestic uses. Fourth is

overall economic progress of the basin through the establishment of employment-income generating enterprises, saving of huge sums of money by the avoidance of flood damage, and immense improvement in social conditions of occupants in the valley (Faniran, 1972).

The TVA experiment heralded the hope for regional development planning that cuts across county, state and national frontiers. Thus, during the 1950s, many similar river valley development authorities such as the Missouri Valley Authority (MVA in the United States), the Danube Valley Authority (DVA in Europe), the Jordan Valley Authority (JVA between the States of Israel and Jordan) were proposed but most of these suffered from major hindrances. Apart from the TVA, the MVA and the DVA which operates as Danube River Administration (DRA), the other regional schemes in operation include Rhone River Development (RRD in France comparable in size to TVA), the Damodar River Development (DRD in Bihar, India), the Murray Basins Development (MBD in Australia) and the Volga Valley Development (VVD in Russia) Olayide (Op-Cit). The greater number of these projects have similar features. Most of them are meant to regulate the flow of rivers for purposes of navigation, flood control, irrigation, etc. Objectives which are usually met by the building of dams that also store water to produce electricity as was observed with TVA.

From the above, it is clear that river basin development strategy consist of many interrelated schemes, each of which has to be considered both by it self and also in relation to the others. From the preceeding discussions, the most important projects usually associated with river basin development are the building of dams for purposes of irrigation, navigation, hydro-electricity, flood-plain development schemes to reclaim flood-prone areas; nature conservation schemes, and schemes concerned with urban and industrial development. These provide a background for the discussion of the Nigerian situation.

In Nigeria, water resources development received the first noticeable mention in International Bank for Reconstruction and Development(IBRD) report. It was noted that planning flood control, major irrigation, navigation and hydrological programmes/schemes was rendered almost impossible by the paucity of information which existed in scattered forms in several agencies. Therefore, it advocated the establishment of a small laboratory for salt and silt analysis of water as well as the study of simple models of water control projects. The importance of collecting data on Rivers Niger and Benue was stressed inview of the agricultural and navigational benefits that could be derived from using such data as a basis for planning. It was also indicated in the report that, cooperation with authorities in French territories in respect of work on the Niger and Benue was necessary. The establishment of a permanent Niger Basin

Advisory Committee composed of representatives of interested governments was recommended.

The first National Development Plan, 1962 - 68 looked at Nigeria's water resources interms of irrigation, urban and rural water supply programmes. Some amount of money was allocated to eleven major irrigation programmes which were Sokoto-Rima Valley, Yobe Scheme, South Chad Basin, Hadeija Scheme, Kano Emirate Scheme, Wurno Scheme, Kware Scheme, Bunza Fadama Scheme, Bukwium-Gomi Scheme, Duku Extension Scheme and Tunga Kawo Scheme, Four of these schemes (Wurno, Kware, Bunza and Bukwium-Gumi) were in Sokoto Emirate alone, No attempt was made, however, to take cognisance of comprehensive river basin approach to water resource development and utilization.

During the period, 1962 - 1968, however, Nigeria was involved in two river basin programmes. The first is the Lake Chad Basin Commission which was established in 1964 as an organ for the promotion and harmonization of the economic development and social welfare policies of the lake area. The participating countries bordering the lake are Niger, Cameroon, Chad and Nigeria.

The second is the Multi-national River Niger Commission which is composed of the nine riparian states: Cameroon, Chad, Republic of Benin, Guinea, Ivory Coast, Mali, Niger, Nigeria and Upper Volta. The commission is entrusted with the task of encouraging, promoting and co-ordinating studies

and programmes concerning the conditions of navigability and the agricultural and industrial exploitation of the River Niger Basin. It makes general regulations to ensure the safety and control of navigation of boats/ ships plying the whole river stretch without discrimination to and/or by any of the riparian countries. It also attempts to control and co-ordinate the use of the waters for navigation, irrigation and the generation of hydro-electric power.

In the second National Development Plan 1970-1974, brief reference was made to River Basin Development under "Town and Country Planning". This concept of development is therefore, regarded as the wide spectrum within which multi-purpose river basin schemes can offer great promise across political frontiers or boundaries between countries, states, and even countries. Realising that the Niger Dam Project falls within such a frame in terms of hydro-electricity, fishing, flood control, irrigation and improved navigability, a Kainji Lake Development Commission was established to exploit and develop the manpower aspects of the Dam Project. The Gongola River Scheme was also seriously considered as a multi-purpose river basin project with emphasis on irrigation, fishing and hydro-electricity.

Baba (1984), observed that, during the Third Plan period (1975 - 80) spatial Planning came to be emphasized for the first time as a means of achieving greater national economic integration and overall development in

Nigeria. The need for rapid internal acceleration in flood and industrial.raw materials production had also become very obvious in the face of rapidly growing population and the experience of a devastating drought for most of the early seventies. It was in this context that river basins came to be adopted as planning units during this plan period.

2.3 The 1976 River Basin Decree

Cognisant of the need for a comprehensive regional/area approach to integrated development within the framework of nineteen states, the river basin concept was resorted to. The Federal Military Government (FMG) called for a comprehensive review of the Third National Development Plan and also requested the newly created Federal Ministry of Water Resources (FMWR) to come up with comprehensive river basin recommendations. The set of proposals made from the review exercises culminated in the promulgation of the River Basins Development Authorities Decree of 15th June, 1976, followed in August 1976 by the Niger Delta Basin Development Authority Decree with the purpose of comprehensive and integrated physical development of the Delta area.

Therefore, by 1976, eleven River Basin Authorities (RBDAs) had been established by Nigeria, later expanded to eighteen and now trimed down to the original number eleven. These Development Authorities are charged with the responsibility of controlling and developing

water resources through dams construction and provision of irrigation infrastructure, exploration and development of underground water, hydrological investigations and water supply for human and livestock consumption. River Basin Development Authorities also engage in large-scale mechanized agriculture, crop processing, establishment of cattle ranches and fisheries activities.

River Basin Development Authorities such as the Upper and Lower Benue, Sokoto-Rima River Basin Authority, Kano-Hadejia, Chad Basin Authority and the Niger River Basin Authority are therefore of prime importance because their areas of jurisdiction include most of the dry season pasture and rangelands open to the pastoral Fulbe herds. An example of this situation is the concentration of cattle along the Sokoto Rima Valley where the Rima River Basin Development Authority too operates. This situation is so because pastoral herds rely mainly on free range grazing and seasonal transhumance for the bulk of their digestible crude protein intakes. This type of cattle management system implies in and out-migration of households and herds within the River Basin Development Authorities and could preclude the desire of maintaining titleship, on long term basis, on arable or good pasture land. Such a system as a matter of fact, reflects the stage of livestock development of the nation and points to the need for rational and optimum exploitation of resources by the pastorlists. Consequently, the onus

of long term optimum land utilization and development that would integrate the pastoral 'Fulbe system rests upon planners.

As it is now, planned cropping along river banks by Development Authorities is likely to bring about new rural farming settlements from 'adjoining' areas and very probably increase crop production. Its effects would be an intensified land use that, if not adequately planned would lead to the closing of existing grazing corridors, and utilization of dry-season grazing lands for crops cultivations. This would also lead to an entailing friction between the pastoral Fulbe and crop farmers and rendering any proposal for the settlement of the pastoralists completely unworkable. This signifies a non-inclusion or ommission of pastoral 'Fulbe in the original plan establishing River Basin Development Authorities.

Although mention was made on livestock production, it does not go beyond establishment of cattle ranches by the River Basin Development Authorities which as a matter of fact are marginalising grazing lands instead of benefiting the pastoral Fulbe . In effect, therefore, the desired integration of rural livestock and crop farmers would be made much more difficult. Since nomadic Fulbe do not have titles on lands, they stand to suffer from any over sight in planning (Okaiyeto, 1981).

2.4 Official Solutions Hitherto

It is indeed undisputable when Baba (Op Cit) pointed out that, it will be erroneous to assume that the conflicting demands for land between arable farming and pastoralism have gone without official (Government) notice. Available records show that right from colonial times concern had been raised about the shrinking range land and the attendant social and economic repercussions. In past colonial times too, reference has been made to this problem in various plan documents. The thrust of official policy towards finding a solution has however been mainly in the direction of establishing grazing reserves. Thus, as early as 1949 grazing reserves had been identified in a report by the International Bank for Reconstruction and Development (IBRD) as a necessary strategy for guaranteeing the continued access of pastoral nomads to adequate rangeland in various parts of the Savanna environment (Okaiyeto, Op. Cit).

By early 1960s it became apparent that the pastoralists of the Northern Savannah zone of Nigeria were gradually being pushed out of the more densely populated areas. Moreover, most of the traditional grazing areas (dry season grazing, wet season grazing grounds and cattle routes to water points) were coming under increasing competitions from both of the traditional users (herders and farmers) - a situation which eventually caused some significant proportion of

the herds to migrate to other areas. It is on this note that the former Government of Northern Nigeria drew up legislation, reserving areas permanently and solely for grazing activities.

Apart from the threat which agricultural and industrial expansion in the rural areas posed to the economic existence of nomadic herders, the programme was meant to bring about a gradual settlement of the nomads. It was suggested that if the programme was successful, it would be possible for their children to be educated, and for all of them to obtain regular health services. Furthermore, economic benefits would acrue through the regular marketing of their milk and milk products. The legislation to this effect was eventually passed in 1965. But since that time, only small areas have actually been established.

It is now being recognised in official circles that Nigerian resources endowments dictate that livestock rearing remain an adjunct to, and part of, arable farming as is contained in the 1975/80 National Development Plan. If the objective as stated in this plan is any thing to go by, our nomadic herders will be encouraged to take to mixed farming, change their traditional production outlook and thereby efficiently improve their use of grazable rangelands.

For Nigeria to carry out this objective about 20 million hectares of grazable land would be required. However, as it stands today, only 2 million hectares have been acquired. Details of the acquisition to date

and the percentage of cattle required to utilize the areas acquired are given in Table 2.3 for ten(10) Northern States where the bulk of the cattle in the country is obtained.

TABLE 2.3: Development of Grazing Reserves: Areas Acquired For Development (In Hectares) Per State And Cattle Population In % 1978 - 1985

States	Target (in ha)	Area Acquired (in Ha)	Balance (in Ha)	Cattle Population (in %)
Bauchi	2,185,440	57,051.5	2,128,388.5	9
Benue	874,130	339,900	534,230	3.6
Borno	6,556,320	213,725.87	6,342,594.3	2.7
Gongola	2,185,440	207,825	1,977,615	9
Kaduna	1,669,040	256,425	1,412,615	7
Kano	1,214,710	25,989.9	1,188,723.1	5
Kwara	2,670,300	181,899.7	2,488,400.3	11
Niger	1,942,500	50,140	1,892,360	8
Plateau	2,039,620	159,288	1,880,332	8.4
Sokoto	2,913,750	465,570	2,448,180	12
Total	24,251,250	1,957,811.4	22,293,438.6	100%

Adopted from M. O. Awogbade (Op. Cit)

* Ha - Hectares.

Of the total areas already acquired in the states listed above, (Table 2.3). 872,296.67 hectares, have been gazetted, while the remaining 1,085,518.7 hectares is yet to be gazetted, as grazing reserves (Awogbade, Op-Cit).

It is now quite clear that, for the past 21 years,

Nigerian government policy has been centred on the establishment of grazing reserves in the cattle producing areas. The broad objective is to provide livestock owners with legal grazing rights and title to land, as a response to the increased pressure on traditional grazing lands by arable farmers and government agricultural projects such as the River Basin Development Authorities (RBDAs) and the World Bank assisted Agricultural Development Projects (ADPs). By encouraging livestock owners to settle within the grazing reserves, it was hoped they would enjoy access to veterinary and extension services. Among the early parcel of land set aside for this purpose was at Ruma-Kukar Jangarai in Kaduna state. It covers an area of 121,762 hectares and has received substantial investment on demarcation, fire protection and water development.

So far, little progress has been made in the direction of grazing reserves concept, except perhaps in the Kachia reserve where 31 agro-pastoralists have begun growing crops and making use of leguminous fodder plots developed with assistance from the International Livestock Centre for Africa (ILCA). These "fodder banks" provide high quality dry season feed to cattle, thus reducing the severe nutritional stress they normally experienced during the dry season. After a few years the soil fertility should increase and the plot can then be used for cropping, forming a permanent

rotation system.

Baba (Op. Cit), also observed that, although the grazing reserves have carried large population of cattle, they are far from adequately fulfilling the goals for which they have been established. The quality and quantity of herbage have declined resulting from increasing pressure. This in turn has necessitated migrations to areas outside the reserves for supplementary pastures. That the problem with the reserves may be clearly understood within the context of three categories of facts, which collectively raise valid doubts about their future prospects.

First, he said, the reserves are at best only a stop-gap measure. When successful (which they seldom are) reserves may enable some spatial separation of cropland and pastoral land during critical seasons. But, on the other hand, the forces which have created the need for reserves are primarily demographic i.e. the rising population of both farmers and livestock. These forces are not abated by reserves. Indeed, on the contrary, the reserves can only encourage the rise of cattle population in an area, which would ultimately lead to further land pressure, land degradation, out migration and open clashes with cultivators.

Secondly, grazing reserves have hitherto been developed as enclave economies. The strategy conceptually attempts to preserve the territorial and socio-cultural dichotomies which have existed between pastoralism and arable farming. It thus merely entrenches the forces

which would foster, rather than mitigate, conflicts between the two systems of production.

Finally, grazing reserves assume the existence of a favourable cultural melieu among the nomads for purposes of facilitating settled or semi settled life. This has however proved largely erroneous, as transhumance is more or less a way of life among 'Mbororo'en' or 'Fulbe Nai'.

Nevertheless, despite limited progress in actual settlement, the idea of having grazing reserves and giving pastoralists more secure tenure has caught on in several states. In Gongola State, there are 74 proposed grazing reserves; 52 under the state government, and 22 under local governments. Four of these have reached the point where they are to be gazetted, but only two (at Sorau and Guyaku) have attracted some physical development and settlement. In Bauchi State, there are 105 proposed reserves, four are proposed to be gazetted and one (at Wawada Zange) has been identified as a pilot settlement scheme under UNDP assistance. In Plateau State, the Wase reserve is also involved through spontaneous sedentarization of pastoralists, (Awogbade, Op. Cit).

Gefu (1986) observed government intervention on pastoral production thus:

> Noting the negative effects of government intervention in Pastoral Production Bourgeat (1981) observed that it is evident that this whole state of affairs, (development of capital accumulation) founded on the imperatives of capital production, is destructive of an already precarious equilibrium which has always existed

> despite periodic difficulties, within traditional pastoral production. The implementation of vertical stratification, together with more wide spread commercialization not under the direct control of immediate producers, lays the foundation for an industrialized form of pastoral production, to the detriment of its subsistence form.

It may be re-emphasized here that the effort of government at capitalist pastoral development and the accompanying technological changes in pastoral societies create a situation whereby accumulation and technical change reproduce inequalities in the distribution of wealth and income as well as generate poverty. Attempts at sedentarizing nomadic pastoralists will not only lead to the concentration of livestock in the hands of a few, but it will force many pastoralists to abandon pastoral activities, such displaced pastoralist are often forced to enter the labour market or are pushed to marginal lands. Others migrate to metropolitan areas thereby compounding the unemployment problem. This could be traced in Funtua Agricultural Development Project where many of the participating pastoralists have ceased keeping cattle completely (Awogbade, Op.Cit).

Reviewing some important programmes of pastoral development in sub-saharan Africa, Goldschmidt (1981), draws the conclusion that, the scheme seldomly succeeded because of an attempt to impose a foreign mode of production. Similar observation has beed made regarding such schemes and programmes in Nigeria. For instance, Awogbade (1985) noted that programs that are aimed at improving the quality of pastoral practices almost

invariably fail.

Gefu (1986) noted that, where sedentarization (usually spontaneous) has occured, nomadic pastoralists are converted into agro-pastoralists with marginal output of both livestock and crop production. That, they produce neither quality nor quantity crops or livestock, as they attempt to drive the best they possibly can from the little resources that are available to them (land, water and so on), which are usually devoted to both animals and crop raising by the pastoralists. Hence, it is believed that, more often, agriculturalists may likely be turned into pastoral producers thereby increasing the capitalization of pastoral production.

Recently, Suleiman (1986) opined that inspite of land and infrastructure having been made available, it must be admitted that success in terms of numbers of pastoralists voluntarily settling is very limited and there are few signs of improved production. He however, attributed this to the facts that:

1. The pastoralists were not given the chance to obtain individual rights to land;
2. Inadequate attention was paid to confirming that proposed reserves were ecologically suitable for livestock and acceptable to pastoralists;
3. That pastoralists were not adequately consulted on their perceived needs and wants,

including their desire to settle, their wish for access to social services, and their need to grow limited area of crops, which is contrary to previous thinking;

4. Inadequate areas set aside for graziers, in conjunction with lack of stock control, has resulted in overgrazing thus making settlement difficult.

It is therefore imperative that, future development must take account of these short comings.

CHAPTER THREE

ANALYSIS OF THE DEMOGRAPHIC CHARACTERISTICS AND TRADITIONAL SOCIO-ECONOMIC SYSTEM

The data analysis is being carried out in two chapters. Chapter three being first of the two, concentrates on the existing traditional economy and social organization of the pastoral Fulbe. Precisely, the data analysis dwels on age structure, family composition, work roles of men and women, roles of cattle on the social structure, clan composition, livestock ownership structure and marketing of livestock, and dairy products among the pastoral Fulbe and the influence of existing seasons on the pastoral economy.

3.1 Age Structure

All but one of the 150 heads of household sampled and interviewed, were males. The only woman in the sample stood for her sick-husband. Occasionally too, eldest children in a bousehold stood for either aged or absent fathers during my call at the pastoral Fulbe camps. The male dominance reflects that, as is obtained among many communities in Nigeria, they are the heads of household and therefore spoke men of the family.

Ages of those interviewed range from 20 to over 60 years as shown in table 3.1.

Table 3.1: Age Structure of the Pastoral Fulbe

Characteristic	(N = 150)		
	Category	No. of Respondents	%fof total Respondents
Age (Years)	20 - 25Yrs	17	11.33
	26 - 30Yrs	23	15.33
	31 - 35Yrs	17	11.33
	36 - 40Yrs	26	17.33
	41 - 45Yrs	17	11.33
	46 - 50Yrs	14	9.33
	51 - 55Yrs	10	6.70
	56 - 60Yrs	12	8.00
	60 and Above Years	14	9.33
Total		150	100

Source: Author's Field Survey, 1987

About 98% of the pastoral Fulbe interviewed are married, 1% single and 1% divorced. This could be seen in table 3.2

Table 3.2: Marital Status of the Pastoral Fulbe

Characteristic	(N = 150)		
	Category	No. of Respondents	% of Total Respondents
Marital Status	Married	147	98
	Single	2	1
	Divorced	1	1
	Widow/er	-	-
Total		150	100

Source: Author's Field Survey, 1987

3.2 The Family Composition

The family is the most important economic and socio-political unit of organization among the pastoral Fulbe in the study area. Production and consumption decisions are made within the family structure. It also forms the most important source of labour, moral support and protection. The extended family type predominates in the study area and makes for wide and common sharing of fortune, both good and bad.

Number of wives in the study area averaged two, that of children six and mean for number of dependants three. Tables 3.3, 3.4 and 3.5 illustrate the composition of number of wives, children and dependants (mostly nephew and/or niece) respectively.

Table 3.3: Number of Wives Among the Pastoral Fulbe

Characteristic	Category	No. of Respondents (N = 150)	% of Total Respondents
Number of Wives	1	69	46.00
	2	45	30.00
	3	23	15.33
	4	10	6.67
	None	3	2.00
Total		150	100

Source: Author's Field Survey, 1987

Table 3.4: Number of Children

Characteristics	(N = 150)		
	Category	No of Respondents	% of Total Respondents
Number of Children	1 - 5	71	47.33
	6 - 10	48	32.00
	11 - 15	11	7.33
	16 - 20	8	5.33
	None	12	8.00
Total		150	100

Source: Author's Field Survey, 1987

Table 3.5: Number of Dependants

Characteristics	(N = 150)		
	Category	No. of Respondents	% of total Respondents
Number of Dependants	1 - 4	61	40.67
	5 - 8	14	9.33
	9 - 12	4	2.67
	None	71	47.33
Total		150	100

Source: Author's Field Survey, 1987

Based on the above tables, the mean family size of the pastoral Fulbe is 12 (See Appendices 1 - 3)

3.3 Work Roles of The Pastoral Fulbe

As is obtained among many pastoral Fulbe in Nigeria the pastoral Fulbe in the study area have unique ways of dividing responsibilities along male/female and age lines. These responsibilities span through social, economic and political aspects and influence socialization of the members of the pastoral Fulbe.

It is therefore, important to note that, pastoral production is not a unitary function performed by men alone. In this case, the pastoral production must not just be considered in terms of animal husbandry per se. That is to say, it must be understood to include not only livestock management but also, the control and distribution of products, the provisions of support services and all the means whereby the domestic unit meets with subsistence needs. Thus, it is against this background that work roles of pastoral men and women are considered and their effects on development.

3.4 Work Roles of the Pastoral Fulbe Men

Pastoral men, both old and young, perform various tasks specific to them towards the survival of their families. Some of their duties include herding of cattle and animal management in its various forms.

Observation and discussions with pastoral Fulbe showed that, herding of cattle is the sole responsibility of men. That, within family system, men have more to do with the cattle, their breeding and watering as well as seeking out for veterinary health care. Because the survival, stability and happiness of the family depends on the cattle, the head of the household must ensure a herdsize commensurate with the size and requirement of the family. Along with this responsibility the head of the household must provide leadership(advisory and authoritative) within the family, attend market for information seeking and take decisions on when to move camp. He teaches his children (sons) to become good herdsmen and provides their food and shelter. He arranges the marriages of his children and enforces discipline within the family.

Children (sons) start herding between the age of

six to seven years. The degree of herding responsibilities given to children of these ages varies. For example, I was informed that, at the age of six children are given the task of keeping the calves away from the domestic supply of grains and when they are about seven years of age, they are allowed to tie up the calves in the evenings. Sometimes they are allowed to help in driving the cattle from the camps in the morning to places of pastures and return home leaving them with older relations. Between the ages of eight to nine, boys are considered old enough to spend the entire day with the cattle together with their older relations. The involvement of children of ages between six to nine years in cattle herding explains why the pastoral Fulbe hardly send their children to school even where they are semi-settled and schools are close to their camps. This could be substantiated by the fact that, 97% of the pastoral Fulbe have not send any of their children to school for according to them, the children are taking care of cattle. Even among those interviewed, 76% have had no education while 22% had Quranic education, 1% adult education and 1% attempted primary school but could not complete (see table 3.6).

Table 3.6: Literacy Level Among The Pastoral Fulbe

Characteristic	Category	(N = 150) No. of Respondents	% of total Respondents
Level of Education	Adult Education	1	0.67
	Not completed Pimary School	2	1.33
	Quranic Education	33	22.00
	None at all	114	76.00
Total		150	100

Source: Author's Field Survey, 1987.

3.5 Work Roles of Women

Pastoral Fulbe women are also engage in a number of work roles meant to aid the sustenance of the family unit. Some of the work roles and support services engaged in by the pastoral Fulbe women include animal herding, maintenance of animal health, domestic chores and their co-ordination.

Girls are trained to herd animals from early childhood to early adolescent years. The training of the girls to participate in animal herding starts from the age of five years and continues to the age of 13 years. However, the actual age at which girls start herding and stop varies from family to family. For those families with fewer boys or no boys at all the burden of herding falls on the girls and their fathers. In such cases the age at which the girls stop herding may extend beyond 13 years. Pastoral Fulbe women also play important role in maintaining the health of the herd. They remove ticks and observe the general appearance and disposition of the cattle during milking. This helps them to diagnose some diseases. They play very important role in traditional herbal treatment of animals by preparing medication from leaves, barks stems and roots of plants gathered by herders.

In some families women milk cows and thus determine the amount of milk to leave for the calves and the amount for domestic use. The processing and sale of milk and its products are the sole responsibility

of the women. As girls grow older, from the age of nine to ten years, they are taken along by their mothers to sell milk and butter. They spend the same amount of time as their mothers spend in selling the dairy products.

Cooking and related activities such as grinding, pounding and sifting of grains, fetching of wood and water, building huts and children care are the main roles of women and girls. When ranking of women work roles was attempted during the survey, children care is found to be the most important with about 19%, followed closely by cooking 18% and fetching water and fire wood as illustrated in table 3.7

Table 3.7: Women Work Roles

(N - 150)

Work Roles	No. of Responses	% of Total Responses
Children Care	150	19
Cooking	141	18
Fetching Water and Fire Wood	137	17
Milk Processing and Marketing	133	17
Building huts	128	16
Milking Cows	64	8
Herds Management	41	5
Total	794*	100

* Respondents who numbered 150 gave more than one alternative in view of nature of questions.

Source: Author's Field Survey, 1987.

Table 3.7 evidently shows that, women perform various major roles and support services aimed at ensuring the survival of the family. It is therefore important that, planning programmes geared towards Pastoral Fulbe to take note of these roles with a view to incorporating them.

3.6 Roles of Cattle on the Social Structure of the Pastoral Fulbe

Interviews conducted with the pastoral Fulbe indicated that, they value cattle as symbol of status, as coinage in business transactions and for the supply of food (milk, cheese and meat). Cattle are also used directly or sold to pay for fines for infringment of local laws e.g. cattle grazing farmlands or damaging crops of sedentary farmers along migration routes. All measurements of value are relative to cattle. Cattle also form the nuclei of common interest that holds a kin group together and their exchange re-inforces the highest esteem of personal ties. Cattle provide the symbol and pathway of a man's approach to deity. They are a source of rich elaboration of speech and songs in the pastoral Fulbe orthography. To a great extent, their possession determines social status, and few aspirations do not depend or cannot be expressed interms of cattle ownership.

The slaughter and/or sale of cattle is very restricted for this reason. Cattle are only slaughtered

when ill or for ceremonial purposes. For regular consumption of meat, goat and sheep are usually prefered since the Pastoral Fulbe also keep these ruminants which are not held in a high esteem as the cattle.

The above has remained a major factor in cattle hoarding and herd build up. Pastoral Fulbe prefer seeing their cattle alive and large in number, even where they are not as well fed, than few and they having liquid cash in their pockets. In relation to their simple traditional mode of life, their need for money and material assets are easily satiable. Their love for the cattle is high and there is convincing evidence that the survival of the pastoral Fulbe during the dry season, depend on the herd size. In fact, the pastoral Fulbe are found to have an emotional bond of respect and affection for cattle which he cannot verbalize. They know the character of each animal intimately and that only unproductive cattle are offered for sale.

The analysis of data in this section suggests that the Pastoral Fulbe of the study area is a function of a way of life developed over several years, anchored by a harsh environment and sustained by a family socialization process and emotional attachment to cattle. Any effort to extract them (Pastoral Fulbe) from this way of life must therefore provide adequate and acceptable alternative to them.

3.7 Clan Composition of the Pastoral Fulbe

Two distinct groups of pastoralists were identified during the field survey. On the one hand are the semi-settled or transhumance pastoralists who usually split their herds for grazing purposes during the dry season. On the other hand are the pure nomadic pastoralists who rarely spend three months within a settlement even during the mid-rainy season when pasture and water are in surplus.

The transhumance pastoralists usually leave some members of their families behind with few lactating cows when going for dry season pasturing mostly along fadama areas. At the beginning of the rains, they normally join the rest of the family members uplands. Even this group of pastoralists has been noted for occasional shifts around their rainy season settlements. The nomadic pastoralists it was gathered, moved with the entire members of their families without splitting their herds for any reason. It is also rare and unusual to find this group of pastoralists returning to their previous wet season camps.

About 45% of the pastoralists interviewed in the field are nomads while 55% formed the bulk of the semi-settled or transhumance pastoralists. These groups belong to various clans within the study area as shown in table 3.8. These groupings would be considered in any settlement plan for the pastoral Fulbe.

It may be noted that, the family organization and social structure discussed in preceeding pages apply

to all the clans with minor and negligible variations. The major significance of the clan is that it serves as a symbol of unity to all the clan members.

Table 3.8: Clan Composition Among the Pastoral Fulbe

Clan	No. of Respondents	% of Total Respondents
Udaen	5	3.33
Kitakuen	11	7.33
Kirien	12	8.00
Rahaji	7	4.67
Wewedbe	7	4.67
Woda'abe	29	19.33
Jaankoen	9	6.00
Wagudaen	5	3.33
Baaen	2	1.33
Jafunen	2	1.33
Goreuji	6	4.00
Wuitien	18	12.00
Ringimaji	14	9.33
Daneji	7	4.67
Wodien	4	2.67
Gorkankoen	4	2.67
Dindimaen	2	1.33
Kesuen	4	2.67
No Respond	2	1.33
Total	150	99.99

Source: Author's Field Survey, 1987.

About 78% of the respondents signify 'Ardo' as their leader while 22% said other than 'Ardo' they also have 'Sarkin Fulani' as a new political title of a leader among them. Both 'Ardo' and 'Sarkin Fulani' play major roles in settling disputes among the pastoralists and at times between pastoralists and farmers. Other than these two political ranks, elders among the pastoral Fulbe are held in high esteem and therefore well respected. Their opinions are highly honoured and are therefore close associates and advisers to the 'Ardo' and 'Sarkin Fulani' on issues affecting the welfare of the pastoral Fulbe.

3.8 Pattern of Livestock Ownership Structure

Research finding shows that, other than cattle, (which is the major livestock) pastoral Fulbe also keep small ruminants like sheep and goats and load animals like horses and donkeys as shown in Fig. 6.

It is important to note that, where these animals are in large numbers, they tend to affect government programmes which in many cases tend to ignore their existence when planning. Thus, an integration and settlement programme for the pastoral Fulbe should not only take cattle into consideration but rather these animals should also be considered since they together with cattle form the livestock industry of the pastoral economy.

On the other hand, table 3.9 illustrates cattle ownership structure among the pastoral Fulbe while Fig.7

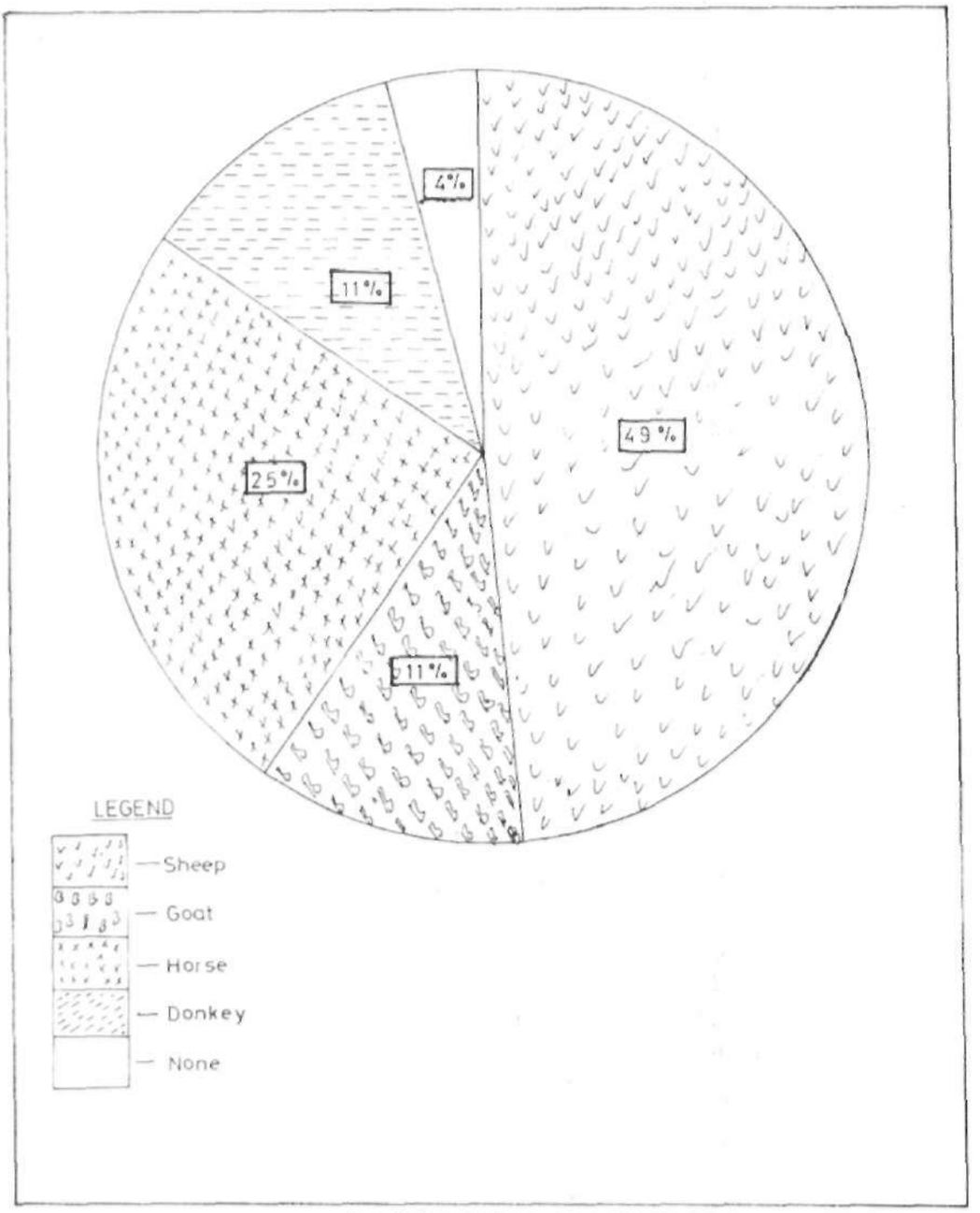


FIG.6 OWNERSHIP STRUCTURE OF SMALL RUMINANTS/ LOAD ANIMALS AMONG THE PASTORAL FULBE

SOURCE: Author's Field Survey, 1987

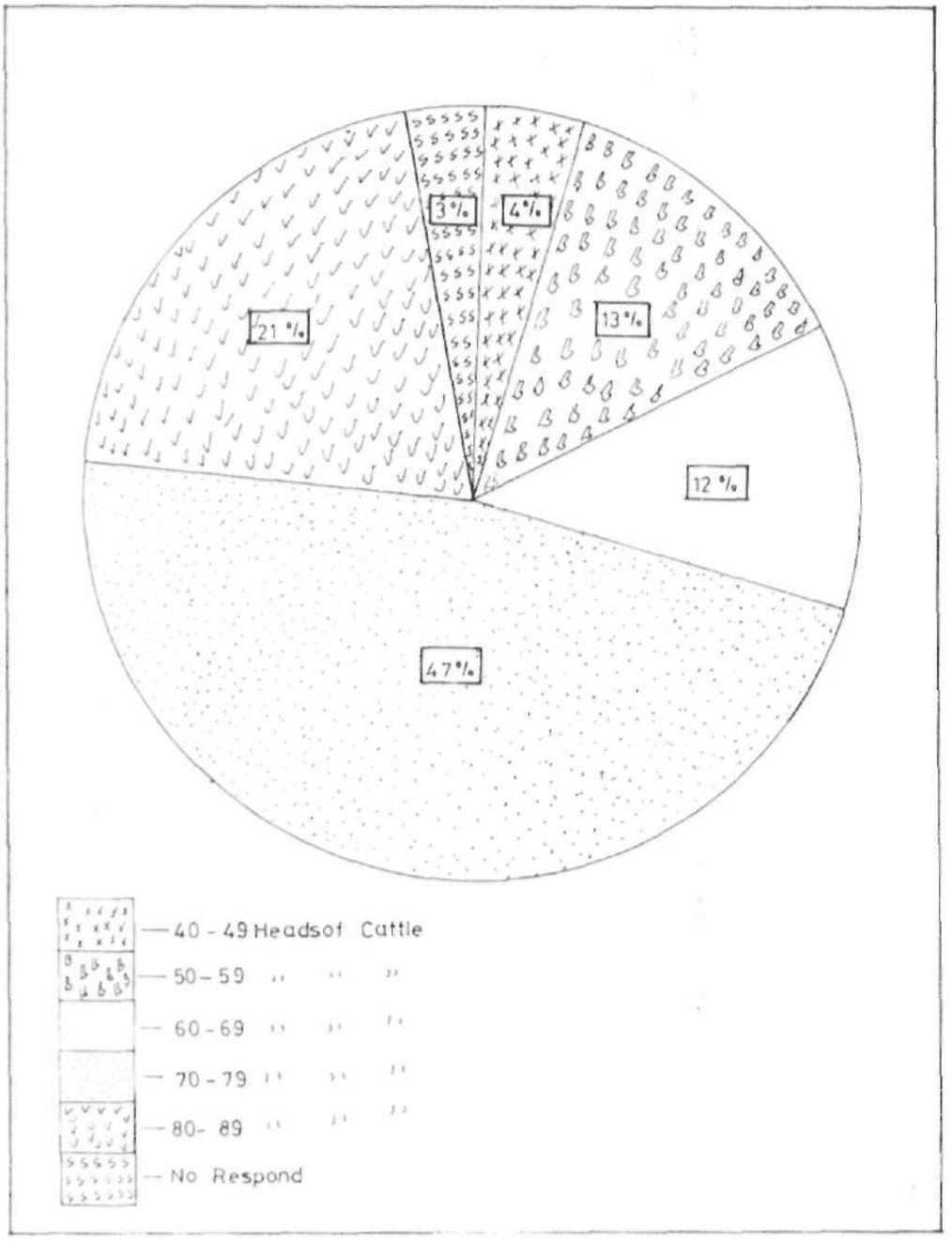


FIG. 7 HERD SIZE STRUCTURE AMONG THE PASTORAL 'FULBE'

SOURCE: Author's Field Survey, 1987

depicts the herd size structure as was obtained from the field survey. A mean of 71.4 heads of cattle was obtained per herd with standard deviation of 10.8 which gave a range of 61 - 82 heads of cattle with about 96% accuracy (see appendices 4 - 5). Therefore, it can now be inferred from table 3.9 that, about 77% of the pastoral Fulbe in the study area have heads of cattle ranging from 61 - 82.

Table 3.9: Herd Ownership Structure

(N = 150)

Herd Structure	No. of Respondents	% of Total Respondents
1 - 2 Herds	115	76.67
3 - 4 Herds	13	8.67
5 - 6 Herds	4	2.67
7 & Above Herds	3	2.00
No Respond	15	10.00
Total	150	100

Source: Author's Field Survey, 1987.

3.9 Marketing of Livestock And Dairy Products

It was gathered from interview with respondents that pastoral Fulbe under normal circumstances do not sell cattle but for the pressure of home up keep, payment of 'jangali' and poll taxes, settling fines from court cases due to crop damage and purchase of drugs for both human, cattle and other domestic animals. Diseased cattle are at times salvaged and sold to butchers. For the low prices of cattle recorded during the survey, pastoral Fulbe reported that they now sell cattle more often than before since there are so many issues to be

settled but cattle are fetching lower prices. Table 3.10 gives the rough estimate of prices for cattle as at the time of field survey. These prices vary from season to season thereby making it difficult to predict cattle prices at one point in time. Moreover, the pastoral Fulbe are faced with other market forces which are beyond their control.

Table 3.10: Cost of a Cow/Bull as at Oct, 86-Jan, 87

(N = 150)

Cost of Cattle (₦)	No. of Respondents	% of Total Respondents
500 - 600	44	29.33
700 - 800	63	42.00
800 - 900	19	12.67
Over 900	7	4.67
No. Respond	17	11.33
Total	150	100

Source: Author's Field Survey, 1987

About 97% of the pastoral Fulbe interviewed revealed that, sale of milk and its products is usually very relevant to the family. However, 3% said it has little or no relevance to the family. According to those pastoral Fulbe who attach importance to the sale of the milk and its products, the money acquired supplement daily family needs. These include, the purchase of soup condiments, grains, children's wear and so on. On many occasions, poll taxes are also settled from the money acquired from these products. Sometimes women

exchange milk with grains - guinea corn and millet in particular. A measure of guinea-corn or millet would fetch two of equivalent measure of milk during rainy season when milk is in surplus. However, during the dry season when milk is scarce, the exchange rate is one measure of either of the crops to one measure of milk. About 87% of the pastoral Fulbe women just sell their milk and its products in settlements next to their camps irrespective of whether other markets can fetch more money than their nearer villages. About 13% however, usually endeavour to travel longer distances to dispose of the milk and the products although the heads of the household expressed concern over the distances being treked by their wives/daughters for the sale of these products.

Research finding showed that, demand for dairy products is highest during dry season and lowest during wet season. This was confirmed by 64% and 63% of the pastoral Fulbe interviewed respectively. About 34% are of the view that, demand for these products is all the year round.

Pastoral Fulbe reported that, getting these dairy products is usually hampered whenever there is a change in camp particularly if it involves long distant treks. About 54% of them reported shortage of milk during movements for they cannot tether calves before getting to the new camps and 46% indicated that, they find it difficult to trace new and reliable markets not only for dairy products but even the livestock when

they get to new camps particularly during the dry season. This period according to them is characterised by severe hardship.

In the light of the above, it is important that, any livestock development programme aimed at improving the livestock industry must take note of marketing dairy products by the pastoral Fulbe as a component of the livestock industry and not a separate and unimportant activity among the pastoral Fulbe as taken by many planners.

3.10: Influence of Existing Seasons Within The Study Area on Pastoral Economy

3.10.1 The Existing Seasons

Since pastoral economic life cycle is tied to existing seasons within any given environment, efforts was therefore made to determine existing seasons within the study area and how each of the seasons influence the pastoral economy.

Four different seasons were identified within the study area commonly named by pastoral Fulbe as 'seeto' (early wet season),'Ndungu' (mid-wet season),'Yamnde' (early dry season) and 'seedu' (mid-dry season). At times 'Ndungu' and 'Dabbunde' are used by pastoral Fulbe meaning wet and dry seasons respectively. Table 3.11 illustrates it more explicitly. Similar seasons were reported by Awogbade (1982).

Table 3.11: The Existing Seasons

Fulfulde	English	Months
'Seeto'	Early wet season	May - June
'Ndungu'	Mid-wet season	July - September
'Yamnde'	Early dry season	October-November
'Dabbunde'	Mid-dry season	December - April

Source: Author's Field Survey, 1987.

From the above table, it appears the dry season has more months than the wet season. This implies for most part of the year, the pastoral Fulbe are inevitably engage in intensive pasturing since according to them pasture and water are scarce during this period.

3.11: The Seasons and The Pastoral Economy

Each of the above seasons has different influence on the pastoral activities.

'Seeto' (May-June) - During this season, pastoral Fulbe usually leave fadama areas for uplands after spending many months along the fadama areas during the dry season. Pastoral Fulbe reported that, this is one of the seasons when cattle are easily lost particularly the older lactating cows which might have lost lots of weight during the previous dry season. Despite the death of cattle, it is a period of hope for the pastoral Fulbe since water and pasture are likely to surface uplands. However, it is also a period when

those who might have left part of their family members uplands join them. Dairy products are however still scarce during this season.

'Ndungu' (July - September) - This is the mid-wet season which is charasterised by less movements by the pastoral Fulbe because water and pasture are available. Pastoral Fulbe reported that, this is the season when they are happiest because there could be more births from their herds to compensate them from some of the loses incured during critical periods. Dairy products are also in abundance both for consumption and marketing. However, this is the period when ticks have to be removed after every two days or else one could loose a whole herd. It can therefore be inferred from the above that, this is the season when pastoral economy is fairly stable.

'Yamnde' (October - November) - This is the early dry season and this period usually marks the beginning of the destabilization of the pastoral economy. Pasture and water begin to deteriorate uplands and pastoral Fulbe normally begin to move towards fadama areas for greener pasture and water. However, pastoralists cannot move right down to the fadama areas for this is the same period when harvesting crops by farmers will be starting. The sale of cattle will begin to rise while quantity of dairy products will be falling.

'Dabbunde' (December - April) - Pastoral Fulbe reported during the field survey that, this is the

worst period on their pastoral life cycle. Inevitably, they have to travel long distances insearch of pasture and water for their cattle. Pastoral Fulbe reported that, more cattle are lost either through theft, falling into ditches or dying of hunger. About 78% of the respondents said they only get milk for consumption, 15% are able to get a little bit over consumption level which they sell for extra earnings for the family and 7% hardly get even what to give to their children.

Understanding the influence of existing seasons on the production cycle of the pastoral Fulbe will no doubt guide any Planning Programme aimed at improving the condition of the pastoralists. It is also important to note that, having clear perception of the production cycle of pastoral Fulbe will enhance any settlement programme if the data are properly utilized by planners and policy makers.

Attempt was made to determine whether pastoral Fulbe at times alter their dry season grazing routes and the results showed that, 43% have been altering the routes while 57% have maintained a single route. Tables 3.12 and 3.13 illustrate reasons for changing and/or not changing dry season grazing routes respectively.

From the tables, one finds that other than pasture and water which are considered paramount to the survival of the livestock industry, other factors like farms, diseases, cattle raids, congestion of cattle in a particular

Table 3.12: Reasons for Changing dry Season Grazing Routes

(N = 150)

Reasons for Changing Routes	No. of Responses	% of Total Responses
Clan Decision	6	3
Shortage of Pasture	43	20
Shortage of Water	47	22
Many Farms along the Route	44	21
Cattle diseases rampant in the area	42	20
Due to cattle raids	28	13
Due to congestion of cattle	2	1
Total	212*	100

* Due to nature of questions, respondents gave more than one alternative.

Source: Author's Field Survey, 1987

Table 3.13: Reasons for not Changing the Grazing Routes

(N = 150)

Reasons for remaining on same routes	No. of Responses	% of Total Responses
Due to fewer farms	32	10
Area free of cattle diseases	54	16
No cattle raids	34	10
Due to water availability	87	26
Due to pasture availability	82	25
Due to clan decision	15	5
Due to occasional vet. services	10	3
Farmers are friendly	18	5
Total	332*	100

* For the nature of questions, respondents gave more than one alternative.

Source: Author's Field Survey, 1987

grazing area, clan decision and attitude of farmers to the pastoral Fulbe all determine where and how pastoral activities take place. All these factors must be taken into consideration when a settlement and integrative model is being considered within the programmes of the River Basin Development Authority.

To obtain relevant information on new or old areas of grazing during dry seasons, scouts are sent out for survey before movements are made. The scouts gather information on the nature of grazing and watering facilities, the presence or lack of animal diseases, the attitude of the sedentary land cultivators towards the pastoral Fulbe, the safety of movement routes and so on. Other sources of information include friends or relatives mostly in market places.

Contrary to the thinking of many, the pastoral Fulbe have proved to have their own prudent method of communication. It is also important, to note that, the meeting of the 'Ardube' (Fulbe Leaders) and their elders at the market places or shades of trees is very important for the survival of the various clans staying in any given location. During the meetings, ideas such as births, marriages, deaths and economic matters involving animal health, the presence of diseases and how to obtain treatment, the sales of animals and so on are discussed. On political matters, they discuss their relationships with other ethnic groups, government decisions regarding

taxation is also discussed. In essence these meetings are used by the pastoral Fulbe adults to make far reaching decisions that affect their entire existence. Therefore, it is important to note here that, though the pastoral Fulbe are yet to be fully integrated in management of national affairs, an efficient pattern of organization exists amongst them. The structure could well be utilized in any meaningful settlement and integrative programme that River Basin Authority could opt for as may be proposed in chapter five of this research work.

From research findings, pastoral Fulbe are found to have been covering long distances insearch of dry season pasture and water. About 54% said they usually cover over 100 km every dry season. Fig. 8 gives a clearer picture of distances covered by the pastoral Fulbe every dry season insearch of grazing areas and water. This actually potrays the true nature of pastoral activities in the study area. While sedentary farmers hardly travel 10 km to their farms, the pastoral Fulbe cover over 100 km in-search of means of survival.

Seasonal movements of the pastoral Fulbe have been motivated by many factors some of which are their desire for independence and freedom from sedentary authorities, cattle raids, and the avoidance of disease infested areas. Equally important, are the seasonal shortages of grazing lands and water as shown in table 3.14.

It is the belief of academicians and some

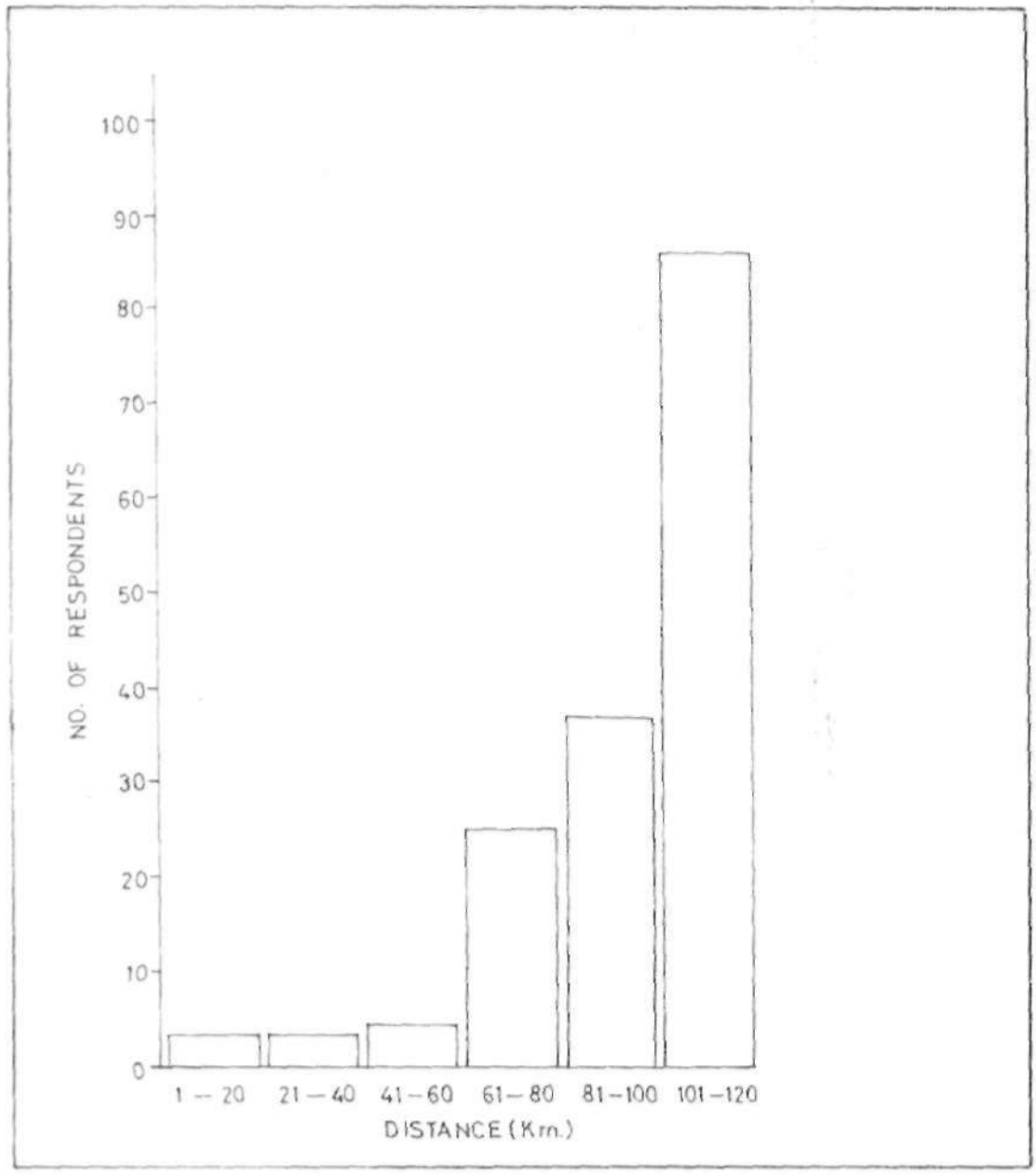


FIG. 8 DISTANCE COVERED BY PASTORAL FULBE DURING DRY SEASON INSEARCH OF WATER AND PASTURE.

SOURCE : Author's Field Survey, 1987

3.14: Reasons behind Constant Movements by Pastoral Fulbe

(N = 150)

Reasons for Migration	No. of Responses	% of Total Responses
Lack of title to land	148	25
Insearch of Pasture	146	25
Insearch of Water	137	23
Due to congestion of Farms nearer Camps	110	19
Due to Cattle diseases	18	3
Due to Cultural Heritage	26	4
Due to Cattle raids	8	1
Total	593*	100

* There was double counting due to nature of questions.

Source: Author's Field Survey, 1987.

researchers that pastoral Fulbe find it difficult to settle because migration or nomadic life is an 'inherent' phenomenon. However, table 3.14 proves the situation to the contrary for only 4% of the responses attach some importance to the factor. Instead, pastoral Fulbe indicated lack of title to land, pasture and water as major factors responsible for their constant movement. They opined that, if these factors could be provided adequately, nomadic life would be a thing of the past. In the light of this, any plan on the settlement of Pastoral Fulbe must take this into consideration.

CHAPTER FOUR

ANALYSIS OF THE PROCESSES OF CHANGE UNDER THE RIVER BASIN DEVELOPMENT AUTHORITY

This chapter continues with the data analysis started in chapter three. The dynamics of the pastoral economy are being examined under the River Basin Authority. Major areas of concentration include the Authority's existing land policies, Livestock programme, provision of social and veterinary services to the pastoral Fulbe, identified irrigable areas, and dry season grazing routes. Impact of the Authority's programmes on pastoral economy will be critically examined. Relationship between pastoral Fulbe and farmers and their perceptions on the integration and settlement programme will be examined too. It is important to mention that, hypotheses set in chapter one would be tested in this chapter.

4.1 The Authority's Existing Land Policies

Interview with some Authority's management staff had it that, land acquisition for operations is channelled through the state governments (Gongola and Bauchi) concerned. On the state governments' approval, local government authorities are directed to release such selected areas to the River Basin Authority. It is on record that, the Authority is always given the opportunity to select areas of operation. This is so because every local government strives to get a project

located within its area. The inplication of this act is that, the Authority is likely to select areas which are already occupied with some activities. An example of this is the selection of the Yelwa-Cattle Ranch (Sardauna Local Government Area) where several pastoral Fulbe were displaced with their thousands head of cattle with no alternative areas (Upper Benue, 1982).

On instances where the Authority decides to choose unoccupied lands, the most fertile areas are taken. It is quite obvious as was observed by one field officer interviewed that, the pastoral Fulbe depend so much on such unoccupied but fertile lands for their pasturing but Authority took no congnisance to such important cases.

Other than direct cultivation of lands acquired by the Authority, farmers are invited to participate in the programme. As in the case of Mayo-Ine irrigation project, plots of up to 2.5 hectares are prepared and handed over to participating farmers for cultivation. Table 4.1 illustrates the pattern of plots (land) distribution to the participating farmers in Mayo-Ine irrigation project.

Table 4.1: Land Distribution to Participating Farmers of Mayo-Ine Irrigation Project

(N = 50)

Size of Plots(ha)	No. of Respondents	% of Total Respondents
Less than 0.5 ha	9	18
0.6 - 1 ha	3	6
1.1 - 1.5 ha	2	4
1.6 - 2 ha	15	30
Over 2 ha	20	40
No. Respond	1	2
Total	50	100

Source: Author's Field Survey, 1987.

It is clear from table 4.1 that, about 40% of the participating farmers held plots of over two hectares. Interview with project supervisor and available data in the Authority's 1985 annual report showed that civil servants and smaller business men are being allocated with plots of about 10 hectares and above. Also, Agro-Allied companies such as Agro-feeds (Nig) Limited, Gese Daddo (Nig) Limited, AFCOTT (Nig) Limited (Cotton Company) and Savanna Sugar Company all engage in joint venture farming with the Authority with ranging land of between 1,000 - 6,000 hectares.

These being traditional grazing areas for pastoral Fulbe with a mean of 71 heads of cattle per herd as was observed in chapter three, has far reaching consequences on the pastoral economy. For the fact that these companies are producing raw materials for

their industries in urban areas would certainly have the tendency of expanding areas of raw materials production as investment in the industries generate more revenue. Already both Agro-feeds (Nig) Limited and [illegible] (Nig) Limited whose processing industries are based in Calabar and Lagos respectively have expanded from 500 hectares each to about 2000 hectares each between 1983 and 1986 (Upper Benue, 1985). Savanna Sugar Company is striving to meet the target of 12,000 hectares from 4,000 hectares in 1985 (interview with General Manager of the Company) under the out-grower scheme of the Kiri Dam Irrigation Project (Lower Gongola Irrigation Project). This is an area again characterised by the pastoral Fulbe (see chapter three) all year round.

A situation of this nature is indeed marginalizing pastoral Fulbe since large expanses of land are being acquired by the River Basin Development Authority and distributed among commercial ventures and individuals. No trace of any effort or intention of any of the companies to give room for the release of crop residues to the pastoral Fulbe. All the companies grow crops (raw materials) both wet and dry seasons thereby not allowing room for the grazing of crop residues.

However, it would be unfair to hold the companies responsible for non of the companies participated in the planning of the Authority's programmes. It would

be more appropriate to hold the River Basin Development Authority responsible for the doom plight of the pastoralists since the Authority plan its land policies and programmes.

Even top management staff of the Authority interviewed acknowledged that, such activities are indeed encroaching into grazing lands with no alternative areas provided to the pastoral Fulbe. The management staff are also aware that present land policies have not given room for the integration of crop and the livestock sectors. For an effective harmonisation of the two economies therefore, new land policies have to be evolve with a view to giving room for free interaction of the two land users and thus ultimate integration. That is to say giving rise to a situation where pastoral Fulbe can settle and take to farming too. On the other hand farmers would also be encouraged to take to keeping some cattle. About 76% of the various government officials interviewed are of the opinion that the River Basin Development Authority should introduce land-use policies that will cater for the pastoral Fulbe and farmers or else both groups will soon be replaced by large scale farmers as was discussed above.

4.2 The Authority's Livestock Programme

4.2.1 Mayo-Ine Project Fattening Scheme Programme

From interviews with some of the Authority's staff and some report documents of the authority, it was

gathered during the survey that, the Authority is attempting some form of livestock development in Mayo-Ine Irrigation Project. Some fattening scheme programme was embarked upon in 1982 with a view to training farmers on ox-plough cultivation. The programme is however yet to have any impact even among the Authority's participating farmers, not to talk of those outside the project area.

Although 86% of the pastoral Fulbe interviewed during the survey acknowledged the existence of the River Basin Development Authority ('Hukuma Nadde Benue') none of them indicated knowing about the fattening scheme programme. In fact, ten percent of the pastoral Fulbe claimed ignorance about the existence of the Authority while four percent did not respond to the interviewer. Similarly, 79% of the Authority's participating farmers in Mayo-Ine Irrigation Project expressed satisfaction as far as extension services on their farm plots are concerned but on the other hand expressed dissatisfaction regarding livestock activities. According to them, it is becoming increasingly difficult to secure tractors. Therefore, it would have been a good idea if emphasis was shifted to animal traction technology which they believe would be more feasible and useful than tractors. It is worth noting here that, if this technology could be step up, integrating livestock and crop sectors would be much more easier.

The Lower Gongola Irrigation Project on the other hand is yet to witness any form of livestock development. This was confirmed by not only the Authority's staff interviewed but also participating farmers within the project and the Pastoral Fulbe interviewed during the survey.

Although, outside the scope of this study, it may be worth noting that, the Authority had established cattle Ranches at Yelwa (Mambilla Plateau), Cham and Jama'are. These ranches are further marginalising the pastoral Fulbe instead of improving their livestock productivity. For instance, the Yelwa cattle ranch occupies about 1,200 ha with about 1,184 heads of cattle. Although, the ranch seems overstocked, interview with Authority's Veterinary Officer incharge of the ranch shows that effort is being made to acquire 2,000 additional hectares. He also informed me that, pasture is well developed in the ranch thereby enhancing the carrying capacity of the ranch. Supplementary feeds in the form of hay, silage, concentrates and mineral licks are also being provided. Rotational form of grazing is gradually adopted in the ranch with effective control.

It has been reported that, the displaced pastoral families were not resettled thereby leading to loss of several heads of cattle.

4.2.2 Provision of Other Services To The Pastoral Fulbe

Although the River Basin Development Authority claimed

to have been offering services to Pastoral Fulbe particularly those around the Mayo-Ine Irrigation Project, about 71% of the pastoral Fulbe interviewed have not benefited from any of the Authority's services while 29% said they have had one thing or the other from the Authority (see table 4.2).

Table 4.2: Services Rendered to Pastoral Fulbe

(N = 150)

Services	No. of Responses	% of Total Responses
Veterinary Services	18	11
Farm Residues	6	4
Earth Dam Water	16	10
Access Roads	6	4
None at All	112	71
Total	158*	100

* There was double counting due to nature of questions.

Source: Author's Field Survey, 1987

From table 4.2, it could be inferred that, only skeletal services are actually rendered to pastoral Fulbe if after ten years of the inception of the Authority only 11%, 4% and 10% are enjoying veterinary services, farm residues and water respectively. It appears there is no arrangement by the Authority to allow pastoral Fulbe access to crop residues despite bumper harvests recorded by both the Authority and its participating farmers during the previous years. It can equally be inferred that, no integration of the

two sectors was made by the Authority since crop residue is an important component regarding the integration of the two economies. This is further justified by the high figure (71%) recorded as those who are not enjoying any service from the Authority.

About 43% of the pastoral Fulbe interviewed go for traditional medicine for the treatment of their cattle while 36%, 17% and 1% got their veterinary services from state government, local government and private sources respectively.

4.3 The Authority's Irrigation Activities

4.3.1 Identified Irrigable Areas

Field investigation revealed that, the construction of the multi-purpose Dadin Kowa Dam across the Gongola River is intended to cater for the water requirements of the areas to be irrigated downstream the river. Suitable irrigation districts totalling 25,000 hectares have been identified, studied and consequently designed and planned for execution as the first phase of the Dadin Kowa irrigation scheme. The Lower Gongola irrigation project, usually referred to as the Guyuk Lot, is the major portion of this scheme covering about 19,000 hectares gross (see Fig. 9).

Field investigation further revealed that, in addition to food and cash crop production, this project is intended to facilitate an out grower scheme for the production of sugar cane to feed the sugar processing

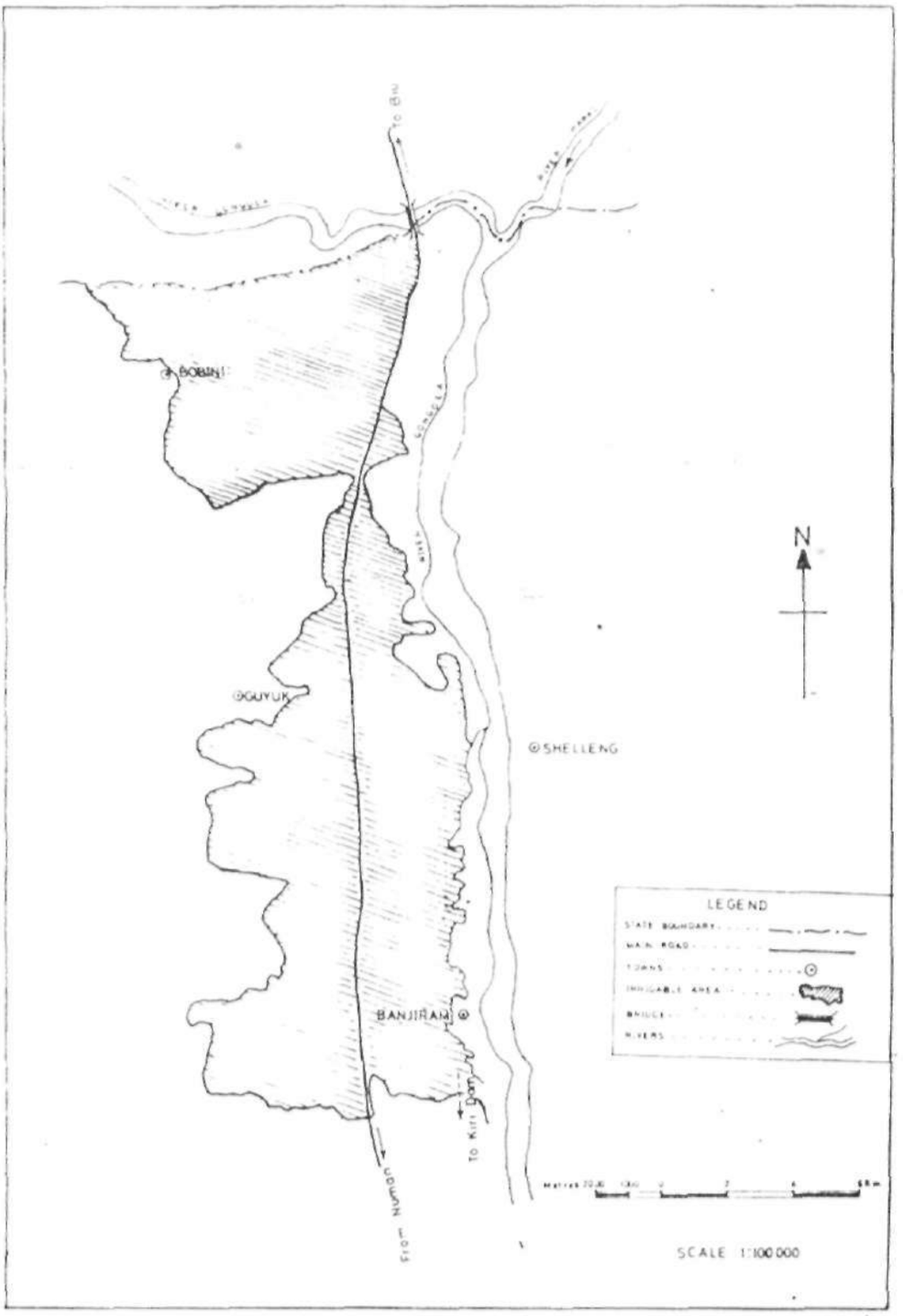


FIG. 9 PROPOSED LOWER GONGOLA IRRIGATION PROJECT (GUYUK LOT)-PHASE 1

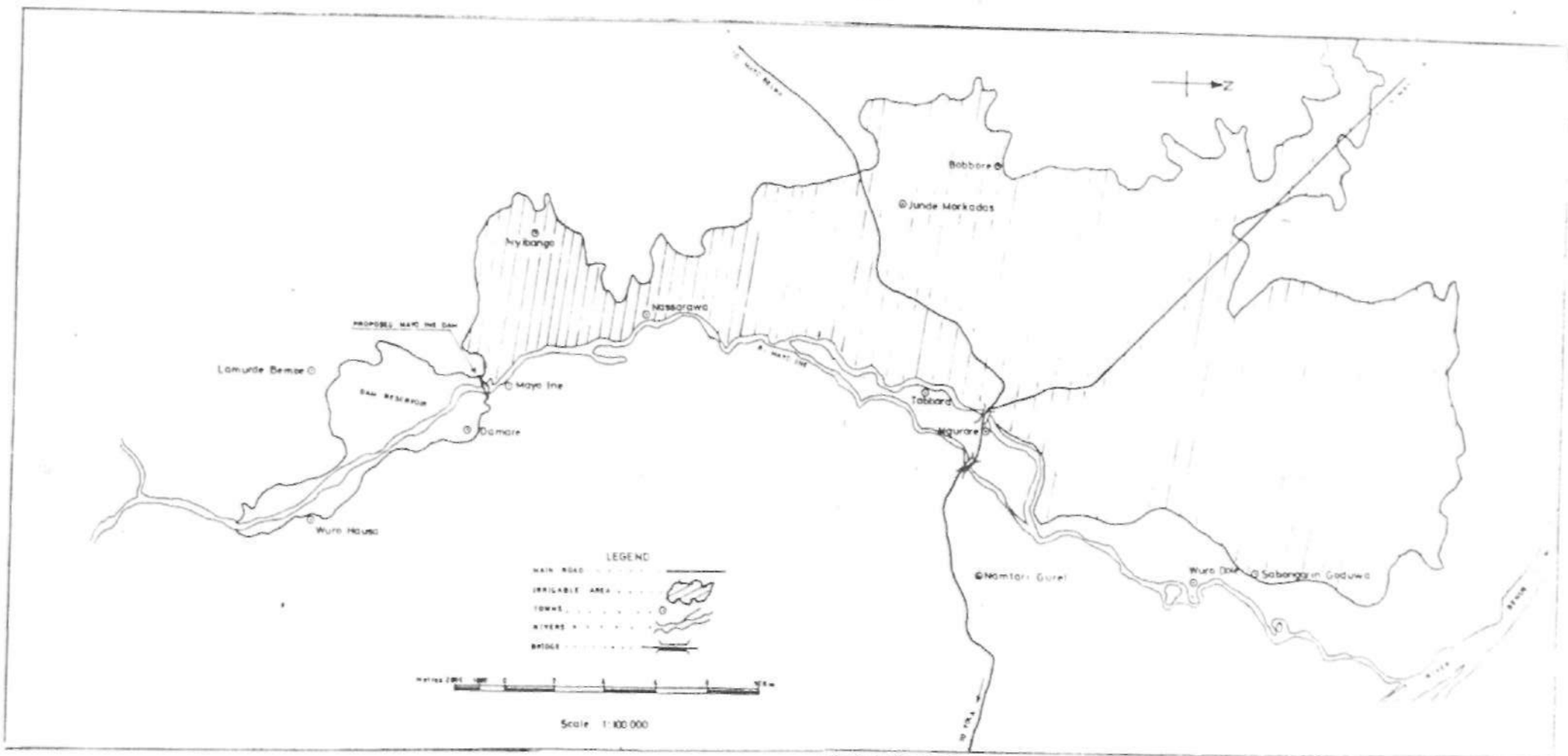
SOURCE: Upper Benue, 1984

factory of the Savannah Sugar Company, Numan.

The River Basin Development Authority also proposed to complete the remaining works of the Kiri Dam and irrigation project during the 5th Plan period so that the entire 12,000 hectares sugar Estate will come under full irrigation. Other than the sugar estate development, Upper Benue River Basin Development Authority has in addition planned to undertake irrigation development in area of about 8000 hectares available on both banks of the Gongola River downstream of Kiri Dam. Tallum irrigation project will also be expanded to 600 hectares from its existing 160 hectares.

Pre-feasibility studies of Mayo-Ine Irrigation Project were completed in 1978, revealing that an earth rockfill Dam 18.5 m high and 3,000 m long across the Mayo-Ine River is essential to bring under cultivation about 30,000 hectares of suitable Fadama lands between Dam site and Dulumi and the Mayo-Ine/Benue confluence as shown in Fig. 10. Production of crops such as rice, maize, cotton and sugar cane are all expected to be achieved by the project.

As is contained in the 5th Plan document of the Authority, detailed study, design, and construction of the Dulumi Dam and Irrigation Project in the entire area of 30,000 hectares will be undertaken during the Fifth five year plan period (1987 - 1991). While work is going on the dam structure, it is proposed to bring under irrigation (by pumping water from the Benue River)



IG.10 PROPOSED MAYO INE IRRIGATION PROJECT–PHASE I

SOURCE: Ward, Ashcroft Parkman (Nigeria) 1978

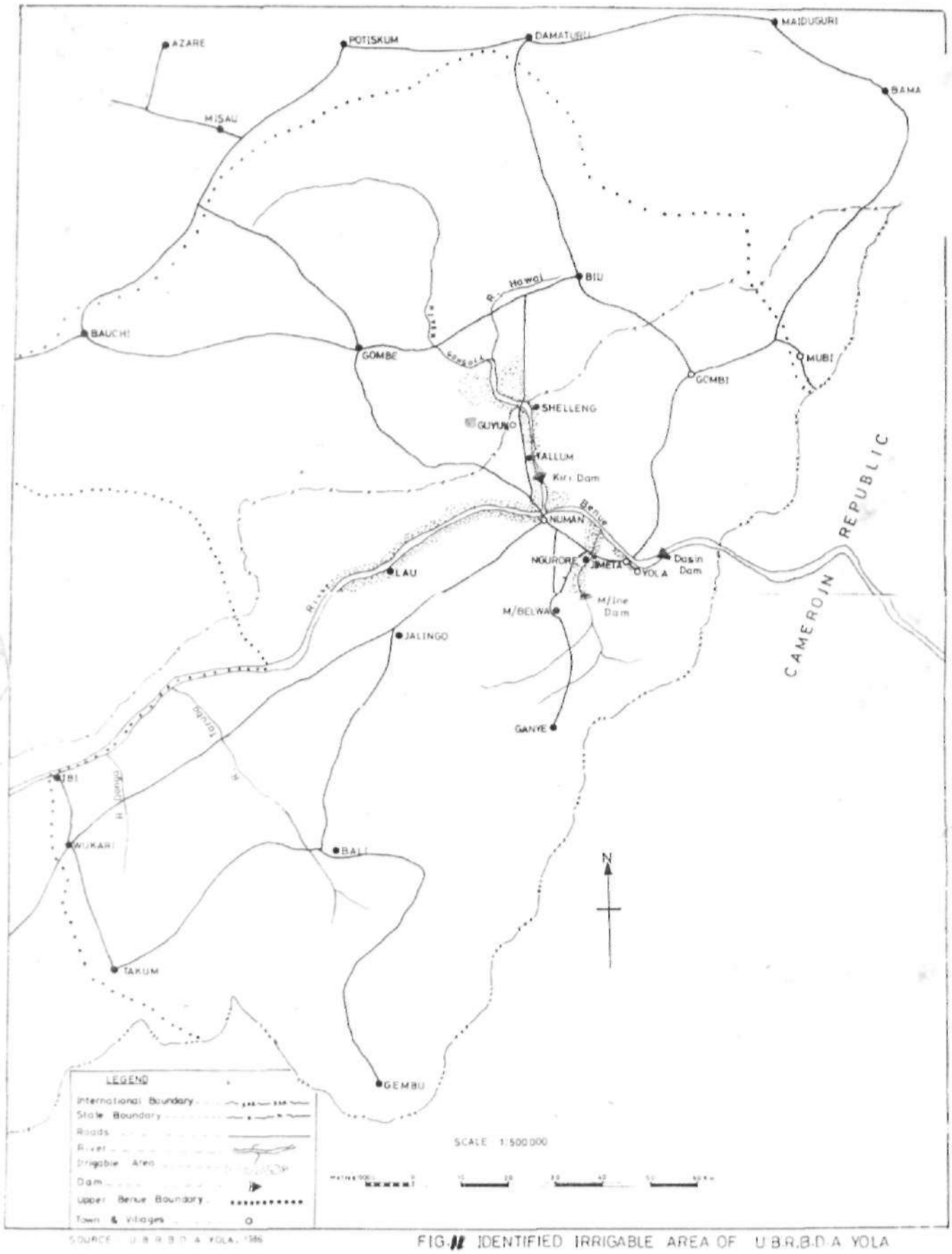
some 2,000 hectares of the lower areas where upto 6,000 hectares have already been fully developed for rainfed cultivation.

Further more, recent studies at pre-feasibility level conducted within Upper Benue (Gammadio) irrigation Project have identified a net area of over 150,000 hectares of irrigable lands available in the upper reaches of the Benue River and that these potentials are proposed to be tapped on the construction of a suitable storage dam across the river upstream of Yola. However, the dry season flow presently available in the Benue is found sufficient to command, out of the 150,000 hectares, some 20,000 hectares around Gammadio (see Fig.11 identified irrigable areas of the Authority).

4.3.2 Dry Season Grazing Routes of The Pastoral Fulbe

During the field survey, effort was made to determine dry season grazing routes of the Pastoral Fulbe so as to examine and ascertain the alleged land use conflict between the Pastoral Fulbe and the River Basin Development Authority. Fig. 12 clearly shows movements of the pastoral Fulbe along Rivers Gongola, Benue and Mayo-Ine.

Examining figures 11 and 12 it is clear that, there exist a direct clash of interest on land-use between the River Basin Development Authority and the pastoral Fulbe. One finds in the detailed designs of Mayo-Ine Irrigation Project and Lower Gongola Irrigation Project,



SOURCE U.B.R.B.D.A YOLA, 1986

FIG. II IDENTIFIED IRRIGABLE AREA OF U.B.R.B.D.A YOLA

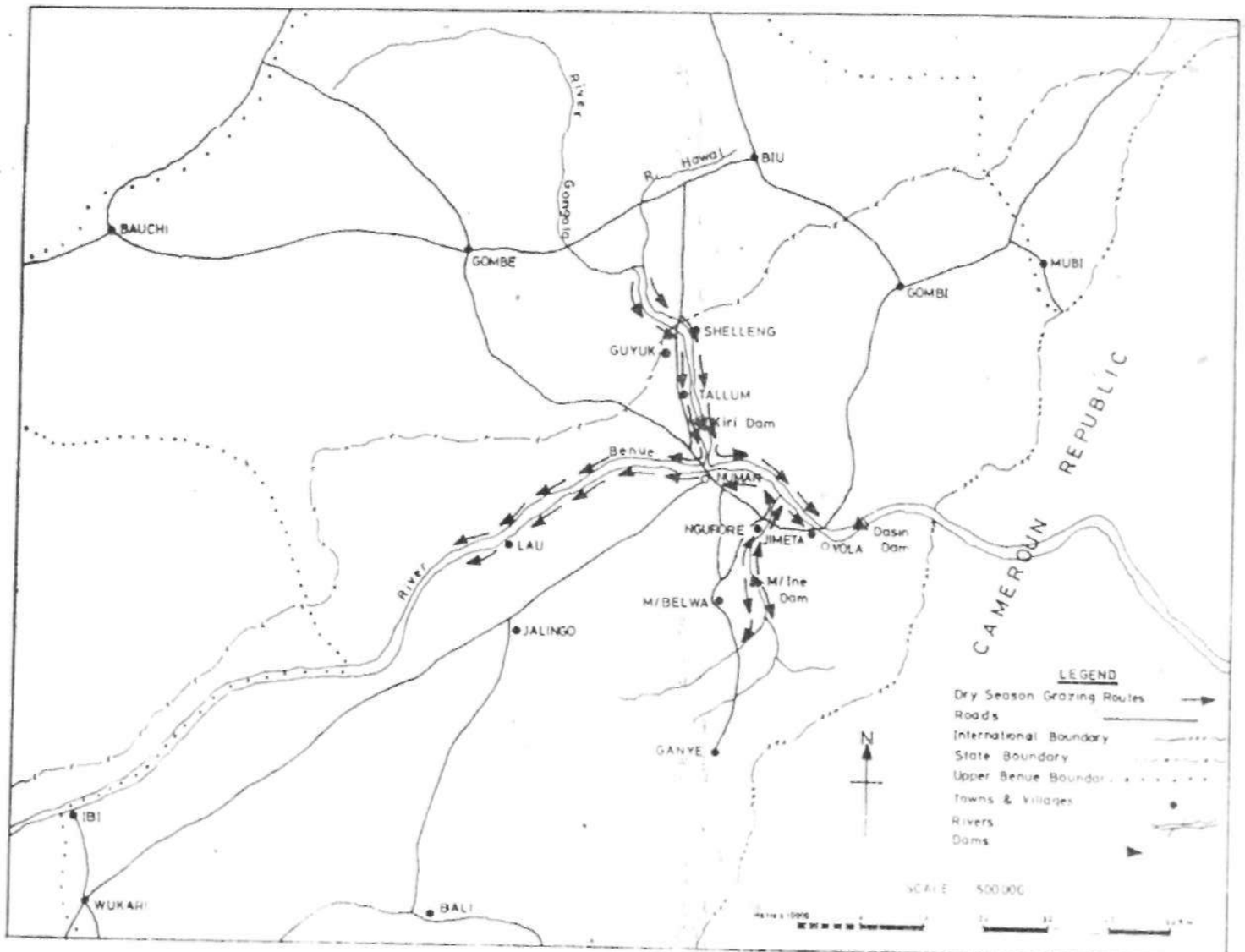


FIG.12 PASTORAL FULBE DRY SEASON GRAZING ROUTES

Source: Field survey, 1981

(Figures 9 and 10) no mention has been made as regards the fate of the pastoral Fulbe. Though the land-use conflict seem to be very apparent and glaring, yet the River Basin Development Authority tends to be ignorant of the consequences. One tends to wonder what becomes of the pastoral Fulbe when all the earmarked irrigation activities proposed by the Authority become fully operational.

The implication of such land use conflict is that, grazing lands and water would increasingly become inaccessible to pastoral Fulbe, Therefore it could be inferred that, this finding tests hypothesis number one in chapter one which states that, " Grazing lands have increasingly become inaccessible to pastoral Fulbe". This now calls for urgent land-use planning geared towards integrating the pastoral Fulbe within the River Basin Development Authority's programmes.

4.4 Impact of River Basin Development Authority On Pastoral Fulbe.

4.4.1 Problems of Grazing Land, Water and Conflict with Farmers

About 89% of the pastoral Fulbe interviewed during the survey said the establishment of Upper Benue River Basin Development Authority has caused problems to them. They complained that, grazing lands are increasingly being encroached upon by the Authority. According to them, the Authority is taking over more and more fadama lands which are previously available as grazing lands.

They are unhappy that, the cattle grazing orbit is being broken by the River Basin Development Authority which is converting more and more land to non-grazing uses. This conforms with what is obtained in Figures 11 and 12 thus further concretising the test of hypothesis number one referred to earlier. Actual measurement, of the changing land-use types could have been undertaken using sample areas for further testing of this hypothesis but unfortunately, the land-use maps were not available to the researcher despite several attempts made. Therefore, this makes it necessary to relly on questionnaire results (see table 4.3).

Field investigation also showed that, conflict between farmers and pastoral Fulbe has been on the increase since land is increasingly becoming scarce and particularly since grazing lands are deliberately being encroached upon. Pastoral Fulbe also complained of disease in the area. Table 4.3 illustrates the points being made above. Effort was also made to concretise some of these allegations (particularly on diseases and pastoral Fulbe/Farmer conflicts) from official veterinary service units, courts and police stations as would be seen as discussions proceed in this chapter.

Table.4.3 Problems Posed to Pastoral Fulbe by the River Basin Authority.

Problems	No. of Responses	% of Total Responses
Less access to grazing land	138	25
Less access to water	142	26
Increase in animal diseases	127	23
Increase in conflict with farmers	134	25
No Respond	5	1
Total	546*	100

* There was double counting due to nature of questions.

Source: Author's Field Survey, 1987

Pastoral Fulbe opined that, as a result of the problems in table 4.3, they have been experiencing lower cattle fertility, higher cattle mortality, lesser dairy products and they now migrate more often than usual (see table 4.4). In order to validate these claims, the zonal veterinary officers of Numan and Yola Local Governments were interviewed. Although records were scanty in both zones, but both officers agreed that from 1979 upto the time of this survey, the areas in question have experienced lower cattle fertility and higher cattle mortality compared to previous years (1974 - 1978). The data available was sort of aggregate type (typical of secondary data) which gave general increase and decrease over a period of 12 years (1974 - 1985) as shown in tables 4.5 and 4.6. Time series graphs are plotted (Fig. 13 and 14) so as to give analysis clarity.

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Table 4.4 Consequences of the Problems pose to Pastoral Fulbe

(N = 150)

Consequences	No. of Responses	% of Total Responses
Lower Cattle Fertility	144	25
Higher Cattle Mortality	145	26
Migrate More often	139	24
Lesser Dairy Products	137	24
No Respond	5	1
Total	570*	100

* There was double counting due to nature of questions.

Source: Author's Field Survey, 1987

Table 4.5: Cattle Population From 1974 - 1985 within Mayo-Ine Irrigation Project(Ngurore)

Year	Cattle Population Under Separate 'Ardos'			Total
	A*	B*	C*	
1974	5177	6128	7413	18718
1975	5230	6235	7495	18960
1976	5353	6374	7559	19286
1977	5402	6460	7653	19515
1978	5473	6559	7739	19771
1979	5492	6567	7749	19808
1980	5480	6552	7736	19768
1981	5407	6507	7673	19587
1982	5236	6307	7471	19016
1983	4056	5062	6189	15307
1984	3619	4546	5692	13857
1985	3385	4327	5531	13243

*. Zones under Ardos who preferred to be Anonymous.
Source: Yola Local Government, 1985.

Table 4.6: Cattle Population within Lower Gongola Irrigation Project (1974 - 1985)

Year	Cattle Population Under 'Ardos'							Total
	A*	B*	C*	D*	E*	F*	G*	
1974	5891	4021	3690	4054	4025	3318	4568	29567
1975	5921	4054	3791	4105	4065	3380	4603	29919
1976	5969	4110	3848	4177	4104	3426	4709	30343
1977	6046	4178	3934	4244	4167	3486	4761	30816
1978	6061	4199	3951	4266	4185	3497	4770	30929
1979	6035	4161	3924	4247	4149	3462	4743	30721
1980	5997	4113	3874	4208	4098	3418	4705	30413
1981	5974	4080	3856	4187	4067	3389	4672	30225
1982	5943	4037	3823	4161	4016	3348	4655	29980
1983	5230	3409	3226	3547	3570	2618	4068	25668
1984	4723	2990	2914	3328	3272	2317	3674	23218
1985	4596	2883	2829	3237	3163	2214	3593	22515

* Zones under Ardos who preferred their names to be with-held.

Source: Guyuk Local Government, 1985.

Although the Veterinary Officers were not very categorical as to whether the River Basin Development Authority is responsible for these problems, but they opined that lower cattle fertility and higher cattle mortality could have been caused by some diseases which to some extent increased as a result of some activities of the River Basin Development Authority. However, there was no laboratory tests as regards to the causes of diseases which are responsible for lower fertility and higher mortality.

Examining figures 13 and 14, it is clear that prior to the establishment of the Authority, there was a steady increase in the herds of the pastoral Fulbe but with the establishment of the Authority, a decrease is also recorded steadily. This fact supplemented with field interviews and questionnaire results confirm hypothesis

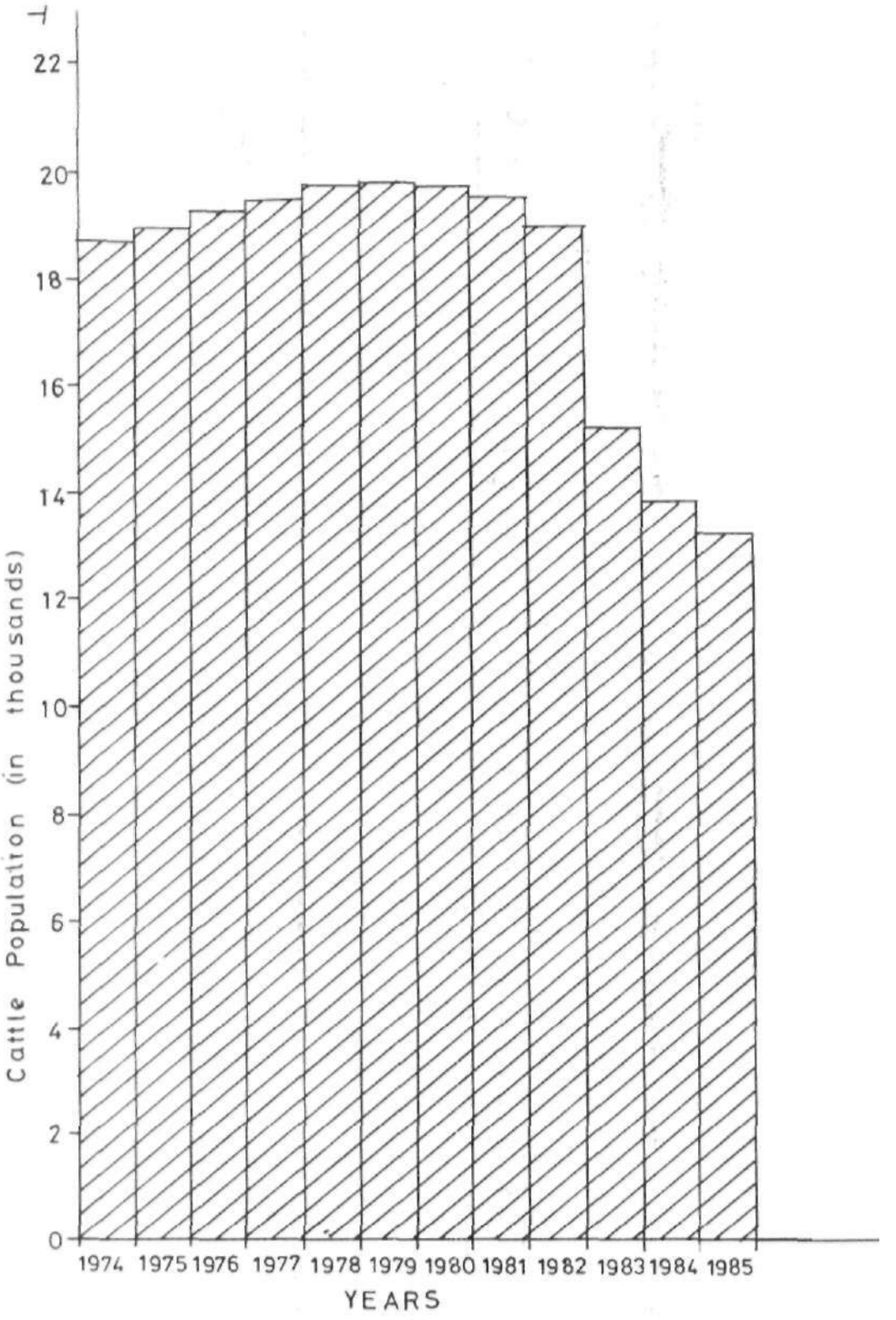


FIG. 13 CATTLE POPULATION WITHIN MAYO-INE IRRIGATION PROJECT (1974-1985)

Source: Author's Field Survey, 1987

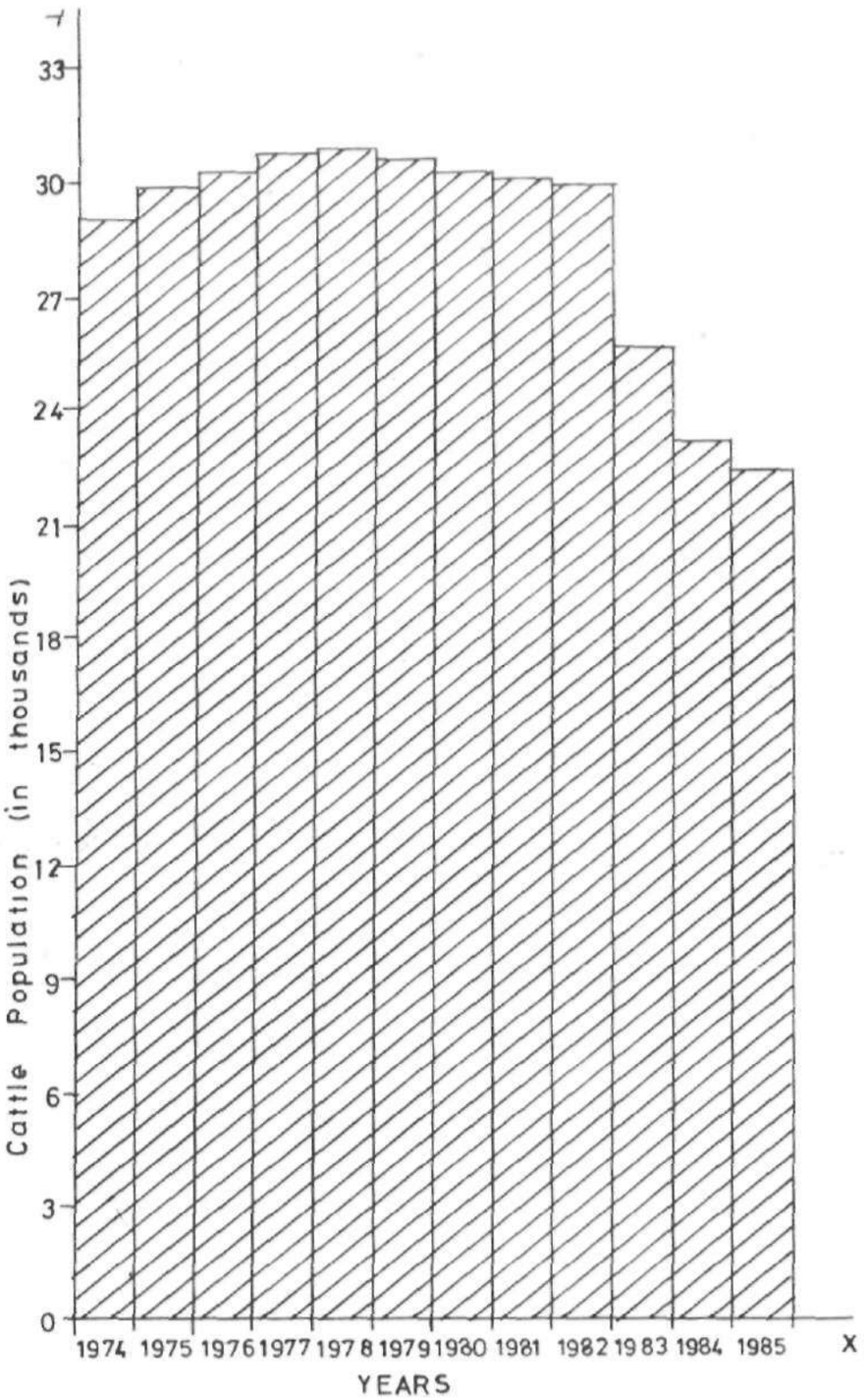


FIG. 14 CATTLE POPULATION IN LOWER GONGOLA IRRIGATION PROJECT (1974—1985)

Source: Author's Field Survey, 1987

number two in chapter one which states that "the socio-economic life of the pastoral Fulbe has worsened". With lower cattle fertility, higher cattle mortality and lesser dairy products, no doubt pastoral Fulbe are placed in a difficult situation.

4.4.2 Incidence of Diseases

About 43% of the pastoral Fulbe interviewed have experienced new diseases since the inception of the River Basin Development Authority, 20% have not experience any new diseases and 37% reported that, some diseases which were in existence have increased.

A disease pastoral Fulbe referred to as 'Balki' (Liver fluke - Fasciliasis) was being experienced around the Kiri Dam reservoir and the poorly maintained earth dams in Mayo-Ine Irrigation Project. This confirms Awogbade's (1984) contention on the effect of dams on cattle. Pastoral Fulbe opined that, the main cause must have been the reservoir and earthdams and other stagnant bodies of water. According to them, there was no such disease before the coming into being of these structures. The veterinary officers incharge of the zones and the River Basin Development Authority's Livestock extension officer (Mayo-Ine) confirmed that stagnant bodies of water are usually characterised by Liver fluke. The researcher also had the opportunity to see a vector of the disease in one of the abandon earthdams of the Authority in the company of the Authority's livestock extension officer and a final year veterinary student

A.B.U. Zaria. Other cattle diseases reported to have increased with the existence of the Authority include, Mycobacterium Bovis (TB) and worms. In addition to the effect of the diseases was the case of cattle poisoning which pastoral Fulbe said sometimes emerges from water or pasture. This is suspected to be the side effect of chemicals. Tables 4.7 and 4.8 further confirmed the reportings of the pastoral Fulbe and interviews with veterinary officers. Time series graphs on Figure 15 clearly illustrates the steady increase in the incidence of diseases.

The various diseases are responsible for the death of over 3,000 heads of cattle in the study area from 1978 to 1985 excluding death toll figures due to rinderpest (1982-85). This figure compares unfavourably with what was obtained two years before the establishment of the Authority and two years after it's creation (1974 - 1977) with a death toll of 79 heads of cattle. However, a high figure (3,000) of mortality recorded has no independent verification, it is correct to regard it with some scepticism as being high. For instance, herd-owners may count as 'dead' sick animals that were sold to traders, or those which died without identifying the actual cause could be counted under these diseases. Also, the lingering belief that, compensation will be forthcoming may have encouraged some herd-owners to inflate figures. Nevertheless, this may only be considered as part of the limitations of this study but not of any significant effect on the data.

Table 4.7 Disease Outbreaks And Treated Cases Within Mayo-Ine Irrigation Project(Ngurore)

Disease	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
A. Liver Fluke (Fascioliasis)												
No. of Cattle:												
1. Involved	-	-	-	-	22	39	78	115	313	364	410	725
2. Vaccinated	-	-	-	-	14	18	32	47	112	200	230	375
3. Dead	-	-	-	-	7	27	64	102	290	311	385	458
B. Round Worm (Ascaris)												
No. of Cattle:												
1. Involved	3	3	7	12	18	27	48	59	72	88	117	133
2. Vaccinated	3	3	7	9	15	18	27	38	50	65	92	106
3. Dead	-	-	-	2	2	8	14	21	32	37	41	43
C. Flat Worm (Tape Worm)												
No. of Cattle:												
1. Involved	15	18	28	35	43	47	69	87	112	135	167	198
2. Vaccinated	12	15	22	30	37	35	48	49	64	78	92	90
3. Dead	N.A	N.A	13	18	17	20	18	23	28	39	57	78

Disease	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
D. Mycobacterium (Bovis TB)												
No. of Cattle:												
1. Involved	3	7	15	24	39	57	75	93	119	162	200	227
2. Vaccinated	3	7	15	18	18	28	45	62	66	79	101	142
3. Dead	1	1	3	7	5	14	23	41	37	46	83	81
E. Rinderpest												
No. of Cattle:												
1. Involved	-	-	-	-	-	-	-	-	2316	8623	6567	3015
2. Vaccinated	-	-	-	-	-	-	-	-	2060	7588	5719	2087
3. Dead	-	-	-	-	-	-	-	-	367	3096	1018	533
F. Unidentified Poison *												
No. of Cattle:												
1. Involved	-	-	-	-	-	-	-	43	25	67	201	257
2. Treated	-	-	-	-	-	-	-	27	16	43	137	215
3. Dead	-	-	-	-	-	-	-	13	2	20	38	62

Source: Kofare Veterinary Zonal Office Yola, 1986 & Mayo-Ine Irrigation Project, Ngurore Office, 1987.

N.A: Not Available

*Suspected to have been caused by chemicals.

Table 4.8:
Disease Outbreaks And Treated Cases Within Lower Gongola Irrigation Project(Guyuk Lot)

Disease	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
A. Liver Fluke (Facioliasis)												
No. of Cattle:												
1. Involved	-	-	-	16	33	54	83	167	351	499	628	773
2. Treated	-	-	-	-	7	18	27	44	89	121	234	374
3. Dead	-	-	-	-	-	-	3	12	39	63	93	123
B. RoundWorm (Ascaris)												
No. of Cattle:												
1. Involved	5	13	17	28	42	41	54	73	80	98	146	221
2. Treated	3	9	17	22	31	39	43	55	62	81	85	110
3. Dead	1	3	9	11	16	19	25	33	37	44	40	49
C. Flatworm (Tapeworm)												
No. of Cattle:												
1. Involved	17	26	29	46	51	77	79	96	142	165	203	238
2. Treated	13	19	22	27	33	42	40	56	70	92	115	130
3. Dead	-	-	-	2	9	13	19	N.A	N.A.	37	48	63

Disease	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
D. Mycobacterium (Bovis T.B)												
No. of Cattle:												
1. Involved	-	-	5	14	24	27	35	62	89	107	131	169
2. Treated	-	-	5	14	18	21	27	45	68	86	94	116
3. Dead	-	-	-	8	N.A	N.A	17*	23	4*	54	68	89
E. Rinderpest												
No. of Cattle:												
1. Involved	-	-	-	-	-	-	-	-	12817	18159	16548	N.A
2. Treated	-	-	-	-	-	-	-	-	11985	16875	12338	N.A
3. Dead	-	-	-	-	-	-	-	-	178	3494	2152	383
F. Unidentified Poison*												
No. of Cattle:												
1. Involved	-	-	-	-	4	15	34	53	64	90	104	168
2. Treated	-	-	-	-	1	15	23	49	61	76	87	142
3. Dead	-	-	-	-	-	-	6	19	35	52	78	112

Source: Zonal Veterinary Office Numan, 1987 N.A. = Not Available

* Suspected to have been caused by Chemicals

Examining figure 15 and responses from respondents as analysed, it is now clear that, hypothesis number four in chapter one which states that "there is a steady increase in the incidence of cattle diseases particularly around flooded areas of Dams impoundments" have been confirmed.

4.5 Relationship Between Pastoral Fuble And Farmers

4.5.1 Relationship Before The Advent of Authority

About 76% of the farmers interviewed during the survey indicated that they have lived with pastoral Fulbe even before the creation of the River Basin Development Authority. About 24% on the other hand said they had little or no contact with pastoral Fulbe before the creation of the Authority. In an attempt made to establish how the relationship of farmers and pastoral Fulbe looked like before the establishment of the River Basin Authority, 30% of the farmers' responses showed that, there had not been any form of conflict between them and pastoral Fulbe, 30% indicated that there use to exist minor conflict due to occasional crop damage by cattle and usually settled between them. However, 16% said the conflict use to be severe between them usually characterised by clashes due to crop damage by cattle and usually settled in courts or police stations.

About 28% of the responses showed pastoral Fulbe

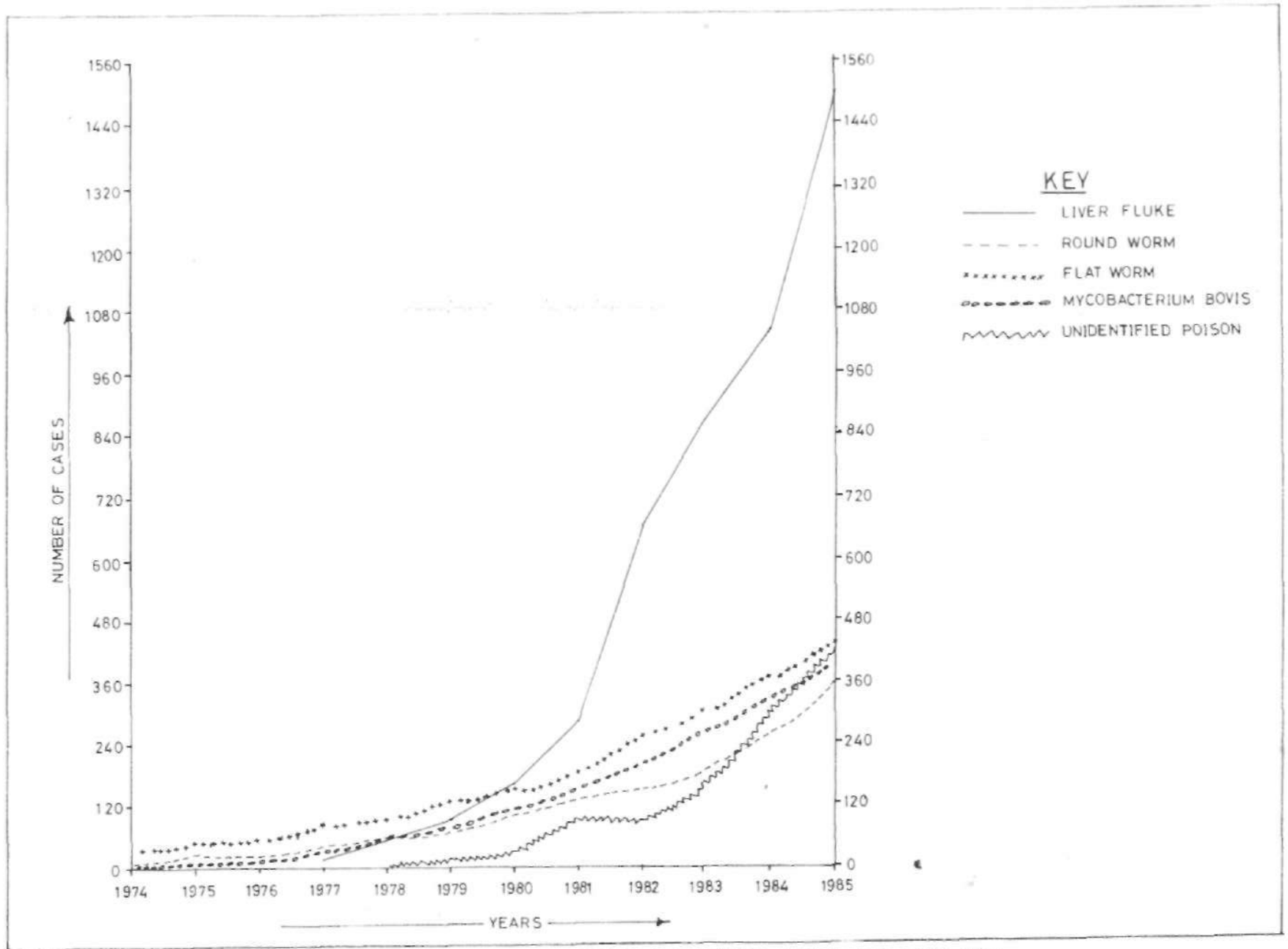


FIG.15 INCIDENCE OF DISEASES WITHIN THE STUDY AREA

SOURCE: Author's Field Survey, 1987

had benefited from farm residues, 7% security, 25% food stuff(grains) and 27% market for sale of dairy products as shown in table 4.9

Table 4.9: Benefits derived from farmers by Pastoral Fulbe Pre-River Basin Authority

(N = 150)

Benefits	No. of Responses	% of total Responses
Farm Residue	46	28
Provision of Security	12	7
Assist in building huts	22	13
Provision of grains	42	25
Market for dairy products	44	27
Total	166*	100

* There was double counting due to nature of questions.

Source: Author's Field Survey, 1987.

Examining table 4.9, it is undoubtful that symbiotic relationship had existed between these two groups. On the other hand, table 4.10 shows benefits derived by farmers from pastoral Fulbe.

Table 4.10: Benefits derived by farmers from Pastoral Fulbe Pre-River Basin Authority

(N = 50)

Benefits	No. of Responses	% of total Responses
Manure	36	40
Dairy Products	25	27
Market for grains	30	33
Total	91*	100

* There was double counting due to nature of questions.

Source: Author's Field Survey, 1987

Table 4.10 further confirms the symbiotic relationship which existed between the farmers and the pastoral Fulbe. Except on trade basis, particularly grains and dairy products, no charges were posed on either of the two groups on all the benefits i.e. to say benefits were acrued free of charge.

4.5.2: Relationship After The Creation Of River Basin Development Authority

About 66% of the farmers interviewed are of the view that, establishment of the River Basin Development Authority has eroded the symbiotic relationship that existed between them and pastoral Fulbe. They think as Authority encroaches into grazing lands, the conflict cannot be avoided. However, 34% of the farmers interviewed did not think Upper Benue is responsible for the worsening relationship between them and pastoral Fulbe. They blamed the situation on pastoral Fulbe whom they claimed have been carelessly allowing cattle to damage their crops. On why pastoral Fulbe are now being charged for grazing crop residues, they said this is because pastoral Fulbe have developed the attitude of grazing the crop residues without obtaining permission from them.

The reality of the situation is that, as the River Basin is acquiring more land for cropping, grazing lands are being marginalised and competition is increasing between the two land users thus, conflicts are bound to occur.

During the survey, effort was also made to establish

main causes of conflict between the farmers and pastoral Fulbe. About 49% of the sampled farmers said the conflict is due to crop damage by cattle and 21% said due to grazing of crop residues. On the other hand pastoral Fulbe are unanimous on the fact that, their conflict with farmers is due to the fact that, farmers in conjunction with the River Basin Development Authority are encroaching into grazing lands, cultivating along cattle routes, blocking water points and cropping right into settlement camps of the pastoral Fulbe. Also, the pastoral Fulbe complained about bush burning and refusal of crop residues to the pastoral Fulbe. They said where farmers sell crop residues to them, they never wait until for them to exhaust the residues before setting fire on the residues. Table 4.11 illustrates what pastoral Fulbe consider as the main sources of conflict between them and farmers.

Table 4.11: What Pastoral Fulbe Consider sources of conflict between them and farmers

(N = 150)

Causes of Conflict	No. of Responses	% of total Responses
Encroachment into grazing lands	130	26
Cropping on grazing routes	132	26
Blocking water points	129	25
Location of farms near camps	115	23
Total	506*	100

* There was double counting due to nature of questions.

Source: Author's Field Survey, 1987.

About 89% of the pastoral Fulbe interviewed said their conflicts with farmers have been resulting into severe clashes. Attimes the conflict could be resolved between the parties involved or through leaders/elders from the two groups, sometimes through the intervention of government (state and local) officials and largely through police and courts. Although obtaining data from courts and police stations was the most difficult, but records of 1975 and 1985 were made available after several attempts. In Ngurore Police station (closest to Mayo-Ine Project), 17 cases were recorded in 1975 and 57 cases recorded in 1985. In Guyuk (closest to Lower Gongola Irrigation Project) only six cases were recorded in 1975 as oposed to 49 cases in 1985. In both areas, I was informed cases between the two groups progressively increased from 1975 upto 1985 but all efforts to obtain the records for the remaining years failed. Examining the data from court and police station, responses from farmers and pastoral Fulbe, hypothesis number three in chapter one which states that, "the traditional symbiotic relationships between the pastoral Fulbe and farmers are increasingly being eroded" is equally confirmed.

In the light of the fact that, all the four hypotheses have been tested and found to be true, it is now obvious that, the central hypothesis which says that, "A planning error was committed while establishing River Basin Development Authorities because the interest of pastoral

Fulbe was not taken into consideration" is also true.

4.6 Opinion of Pastoral Fulbe On Settlement Programme

About 84% of the sampled pastoral Fulbe have at one time or the other thought of taking to settled life. According to them, lack of title to land will one day exterminate them completely from their means of survival. That, movement from place to place is quite hectic and that settled life will minimize their sufferings thereby raising their standard of living to an appreciable level. About 16% however, said they have not thought of taking to settled life at any time for they fear that would mean giving up pastoral activities and taking to farming. They cited examples of some settled and sedentarized pastoralists who now own few or no cattle at all in villages closer to their camps.

About 79% of the sampled pastoral Fulbe have heard about government intention to settle them while 21% have not heard of such government intention at all. About 74% felt that is quite a good and acceptable intention, while 23% felt is not an acceptable intention and 3% did not respond. For those who think it is not a good idea, said on several occasions government had promised doing one thing or the other to pastoral Fulbe but could not.

About 59% of the pastoral Fulbe think the River Basin Development Authority can contribute towards their

settlement 33% think otherwise while 8% said they have no idea regarding this issue. For those who feel the Authority is in a position to contribute towards their settlement, are of the view that since the Authority presently controls large traces of land, it can provide settlement areas. That the Authority in addition is in a position of providing facilities such as water and veterinary services and can also assist in arranging for farm residues both from the Authority's plots and farmers' plots. Table 4.12 illustrates these facts.

Table 4.12 River Basin Authority's Contribution to the settlement of Pastoral Fulbe.

(N = 150)

Contribution	No.of Responses	% of total Responses
Provide Settlement Areas	58	26
Can provide Water	45	20
Can provide veterinary services	29	13
Can arrange for farm residues	57	26
Can provide Extension Services	33	15
Total	222*	100

* There was double counting due to nature of questions.

Source: Author's Field Survey, 1987

However, those who feel the River Basin Authority cannot contribute towards the settlement of pastoral Fulbe said the Authority has not shown any interest in them and that the Authority was established many years back but upto the time of interview nothing had beer

offered to them to improve their livestock. Further more, the survey showed that, this group sees the Authority as another new land-use competitor more dangerous than the ordinary farmers. They are pessimistic that, if at all the Authority would attempt settling them, only bad (non-fertile) areas would be given to them (see table 4.13).

Table 4.13 Why River Basin Authority cannot contribute towards settlement of Pastoral Fulbe

(N = 150)

Why the Authority cannot Contribute	No.of Responses	% of Total Responses
Show no interest in pastoral Fulbe	42	26
Though established for long but not done anyting	39	24
Seen as new Competitor	47	29
Can only offer unsuitable(non-fertile) areas .	33	21
Total	161*	100

* There was double counting due to nature of questions.

Source: Author's Field Survey, 1987

Certainly, serious effort has to be re-inforced so as to repose confidence in the minds of the pastoral Fulbe or else settling and integrating this group of pastoralists will be difficult for they are already sceptical about the River Basin Development Authority.

Pastoral Fulbe preferred other than the Authority, the inclusion of their opinion leaders along with representatives from state governments, local governments and farmers in planning, implementing and managing of

any integration and settlement programme.

On what would be the main contribution of pastoral Fulbe towards their settlement and integration into the crop sector, 35% said they will participate actively in communal activities that may likely come up when the programme is on. About 20% of the respondents among the pastoral Fulbe will assist in identifying suitable areas for settlement within the Authority's jurisdiction, 17% said they will help enlighten others to accept the programme, 16% will give their maximum co-operation towards successful implementation of the programme and 10% have no idea on what would be their role towards the success of the programme.

Although pastoral Fulbe had expressed the fear of settling in the same place with farmers due to inevitable crop damage by cattle, but they are quite willing to be amicably integrated with the farmers so as to enable them take to farming too. Already about 31% of the semi-settled pastoral Fulbe are growing crops such as millet, Guinea Corn, Maize and beans while 69% indicated that they buy all their food requirements from the market. It is therefore clear that, crop cultivation per se is not entirely a new phenomenon among the pastoral Fulbe particularly those identified as semi-settled or transhumance. For the fact that, integration and settlement programme would be geared towards encouragir pastoral Fulbe to persue pastoralism and cropping together, the above could be an advantage. Indeed,

pastoral Fulbe must not settle and practice only their traditional system of production.

Table 4.14 presents opinion of pastoral Fulbe regarding necessary tools for integration and settlement programme. About 22% think provision of adequate pasture, water and veterinary services will enhance the programme. About 18% and 15% feel provision of security and involvement of the pastoral Fulbe respectively is necessary.

Table 4.14: Necessary Requirements for a Meaningful integration and settlement Programme

(N = 150)

Necessary Services and Processes	No.of Responses	% of total Responses
Provision of Pasture & Water	86	22
Demarcate Cattle Routes	50	13
Provision of Veterinary Services	86	22
Involvement of Pastoral Fulbe	60	15
Provision of Security	70	18
Curtailing bush fires	21	5
Market for Dairy Products	19	5
Total	392*	100

* There was double counting due to nature of questions.

Source: Author's Field Survey, 1987

About 85% of the sampled pastoral Fulbe are willing to settle if necessary amenities can be provided. About 8% were undecided while 7% could not respond. This clearly indicates the desirability of pastoral Fulbe to secure title to land and ultimately taking to settled life.

4.7 Farmers' Opinion On The Settlement Of Pastoral Fulbe

About 64% of the farmers surveyed during the study have heard of government intention wanting to settle pastoral Fulbe. About 36% however, said they have not heard about it, Upto 94% of them said that is a welcome idea while 6% tend to be undecided. For those who upheld the idea, they urged that, government should expedite action for according to them, if successful, crop damage by cattle would be minimised since the programme is aimed at integrating the two economies. They also opined that, with crop residues, meant more forage for their cattle which will be more useful during critical periods. It is hoped that, this and other amenities will, if well implemented and managed keep pastoral Fulbe within their proposed settlements throughout critical periods when movements are more likely to occur.

About 84% of the sampled farmers are willing to rear cattle along with their main occupation (farming). Although not all the farmers seem to know the implications adequately, it appears some of them are keeping few heads of cattle (mostly bulls). This is one of the motivating factors as observed. About 68% of the surveyed farmers are also keeping some other livestock such as goats and sheep. They feel that will be an opportunity for them to maintain some bulls for traction and free access to manure. For the 16% who are not interested see cattle rearing as hectic and can only be handled by pastoral

Fulbe who have already specialised in that aspect of production.

On settlement pattern to be adopted, 49% of the respondents tend to favour allocation of plots for farming and settling near them but to isolate cattle, 24% are of the opinion that both pastoral Fulbe and their cattle be settled in areas isolated from both farmers' settlements and their farms. About 27% of the respondents however opined that both pastoral Fulbe, their cattle and farmers could be amicably integrated for the benefit of both parties.

Like the pastoral Fulbe, farmers also feel that, the involvement of both farmers and pastoral Fulbe in the integration and settlement programme is necessary so as to create a conducive admosphere for a harmonious existence between the two groups. Farmers perceive involvement interms of seeking their opinions about their needs and preferences.

Based on findings and analysis in this chapter and the preceeding one, (Chapter Three) an integration and settlement plan is being proposed in the next chapter.

CHAPTER FIVE

A PROPOSED DEVELOPMENT MODEL FOR THE SETTLEMENT AND INTEGRATION OF THE PASTORAL FULBE WITHIN THE RIVER BASIN DEVELOPMENT AUTHORITY'S PROGRAMMES

This chapter highlights some suggestions on how pastoral Fulbe could be settled and integrated into the programmes of the River Basin Development Authority based on the findings in the preceeding chapters. As was observed in chapter four, the River Basin Authority has not performed much towards integrating pastoral Fulbe within its programmes. The Authority's areas of operation vis-a-vis cattle movements make it important that special efforts be made by the River Basin Authority to provide facilities for the pastoral Fulbe and minimise the areas of conflict between them and the farming communities. For the location of the Authority's projects along the major rivers that provide luxurious pasture for dry season grazing and watering, the Authority will always have a seasonal influx of pastoral Fulbe. The more amenities are provided, the higher the influx is likely to be.

Indeed, with the general scarcity of renewable resources in Nigeria and the present trend towards a reduction in the rate of use of these resources, it would appear logical for the River Basin Development Authority to maximise the utilization of the natural advantages it possesses by integrating crop and livestock production to the benefit of both the pastoral Fulbe and crop farmers. Therefore, to improve and

increase livestock production, the River Basin Development Authority should look into the possibilities of encouraging pastoral Fulbe to transfer their home base (camps) and associated cropping activity tendencies to areas where easy linkages with the Authority are located. It is hoped that, through the gradual achievement of a greater integration of crops and livestock, Nigeria will achieve an increased production in both sectors, thus taking the nation closer to the ultimate goal of self-sufficiency.

5.1 Socio-Cultural Dynamics And Integration Of Pastoral Fulbe

The proposal to integrate pastoral Fulbe within the River Basin Development Authority's programmes can be described as a renewed effort to develop cattle producing areas by assigning definite land rights to forestall the consequences of land misuse. It is anticipated that, pastoral Fulbe will then conserve pasture resources by gradually limiting the number of stock to be managed within the Authority's projects. This is aimed at consolidating the rights of cattle rearers in the face of gradually diminishing grazing lands brought about by increased demands for farming land.

In order to realize the above, a type of settlement programme which suits the pastoral Fulbe socio-cultural dynamics has to be evolved. Two options are being considered here. The first would be to use the pastoral

Fulbe territorial groupings, and the second option is to use their domestic grouping. The problem associated with using territorial groupings as the basis for settlement and integration is that these groupings are 'amorphous and fluid' (Awogbade, 1986). Political, social, and economic controls are very difficult to maintain, making it unlikely that such groups can meet the economic and management requirements of the settlement and integration programme. On the other hand, if the domestic unit is used, there is the advantage that the household head already holds socio-economic and political authority. The household's organization structure makes it easier to secure tenure.

It is important to note that, a settlement programme of pastoral Fulbe must come to grips with the problems of interpersonal and inter ethnic group formation and identification, Fulbe assimilation, aculturation and ethnic-identity and land ownership and use rights. The River Basin Development Authority should therefore settle pastoral Fulbe based on family units at the sametime taking cognisance of the various clan groups and lineages existing among the pastoral Fulbe.

5.2 Pattern Of Settlement

Since the pastoral Fulbe prefer settling with their cattle as opined in chapter four, there must be deliberate and systematic plans by the River Basin Development Authority to settle the pastoral Fulbe within the Authority's

projects. This calls for the provision of secure titles to land so that, it should not be possible for any local chief or landlord to eject them a few years after they have settled.

The River Basin Development Authority should allocate between 210 to 280 hectares(ha) of land (depending on the herdsize holding) to between 50 to 100 families during the first phase of the programme. This gives approximately between 3 - 4 ha per animal unit. Given the mean herd size in the study area as 71 heads of cattle (see appendix 4), the 210 to 280 hectares are considered adequate and should in addition cover residential areas, cultivation plots, and pasture development plots. Herd plots should be demarcated into paddocks commensurate to number and sizes of herds. Paddocks for fattening scheme should also be provided within the earmarked areas. The paddocks would mostly be stocked by weight animals while the rest of the cattle would be grazed in common grazing areas. Destocking should gradually be introduced among the settling pastoral Fulbe.

For the nature of pastoral economy and socio-cultural settings of pastoral Fulbe, disperse pattern of settlement is more ideal than the nucleated settlement pattern. Therefore, each family should have its compound located separately from other families but located within the 210 to 280hectares recommended for each family unit.

It is also important to mention here that, families should be given freedom of chosing their neighbours if they so wish to. The pattern should be in such a way that all residential areas are located on the same side, farm plots on the same side, cattle plots on the same side and pasture plots also located on the same side. What is being said here is that, the pattern should be in such a way that like activities should share the same environment. Residential areas should be located on suitable sites for easy development and should be linked with community facilities such as water, health centre and schools. They should also be properly linked with work areas.

In addition to allocation of pockets of land for settling pastoral Fulbe within the Authority's projects, communal grazing areas should be developed and reserved in the upland and fadama areas of the projects. Since field survey had it that, the Authority has planned for irrigation cultivation on the right bank of River Gongola and left bank of River Mayo-Ine (Figures 9 and 10 in Chapter four) as phase one, the banks of the rivers which are reserved for phase two crop cultivation should now be planned for livestock development. Larger areas should be planned for communal grazing while the rest of the areas should be demarcated and shared between pastoral Fulbe and farmers for pasture development (Fodder Banks).

5.3 Pasture Development(Fodder Bank)

To minimise and ultimately eliminate migration of pastoral Fulbe particularly the nomadic group, which among other reasons is caused by lack of pasture during dry season; the River Basin Development Authority should encourage both the pastoral Fulbe and the Authority's participating farmers to engage in pasture development through the cultivation of improved species of grasses and legumes that can carry cattle throughout the year. Through the River Basin Development Authority's extension workers, the pastoral Fulbe and farmers should be able to manage their pasture development plots either individually or in group. Farmers who may produce more than their requirements could sell to the pastoral Fulbe at a price that might be determined by the two groups with the River Basin Development Authority acting as the mediating body. It is important to note that, fodder plots must be protected from cattle and other animals. In the light of high cost of imported fencing materials, the Authority with pastoral Fulbe and farmers should identify local trees suitable for live fencing. This would no doubt solve the problem of cost of fencing. The provision of fodder in the dry season will prevent major weight loss and consequently animal deaths and to avoid the necessity for transhumance. Fodder also improves the survival of pregnant cows and suckling calves.

Since fodder bank increases soil fertility and thus crop yields, a method would be deviced in such a way that,

instead of leaving lands fallow, fodder plots would be alternated with crop plots so as to fertilize the soil. In fact, not only will the fodder bank increase soil fertility but the manure from the livestock which graze the fodder bank, will further increase soil fertility. Therefore, this substitution of the fodder bank in place of fallow, will optimise production, by increasing and improving the forage available for livestock. Therefore, it can safely be said that fodder other than its traditional role, it is also recommended as part of the cropping system both for farmers and pastoral Fulbe.

5.4 Establishment Of Grazing Corridors

As more pastoral Fulbe settle down to improve conditions for their herds, more Fulbe are expected to enter into the River Basin Development Authority's areas of operation and increase the population. Unless grazing corridors are established and maintained, free of crop farms, movements will become more difficult and create serious conflicts. The grazing corridors should be wide enough (40 - 50 metres) to allow free movement of the pastoral herds. The grazing corridors other than leading to watering points should also lead to the projects' communal grazing areas (reserves) and the Authority to allow the building of temporary tents along their length. Where necessary, the Authority should appeal to government and communities to provide additional land for the extension of the grazing

corridors. Here, inter-local government and interstate co-operation will be needed in order to plan the most efficient routes for the pre-settlement movements of the pastoral Fulbe. Such movements allow interaction between the settled and the settling pastoral Fulbe who can compare notes and can receive encouragement to settle.

The exact details of where and how the grazing corridors should be set up require precise information on the population and distribution of villages lying between the adjacent project grazing areas of the Authority. The Authority's communal grazing areas already set aside through which the corridors should pass. However, where there are unreserved pieces between these communal grazing areas, such pieces have to be acquired.

At strategic points along each corridor, some market outlets and businesses should be established, manned by private groups including the pastoral Fulbe, to cut, bale and store hay and make silage, salt licks and drugs available to moving herds. At the same points, there should be milk collecting facilities and abbatoirs.

5.5 Water Development

Water is an essential element of life. Field findings showed that, pastoral Fulbe trek over 100 km in search of water for their cattle in particular. In the light of this, any settlment programme for pastoral Fulbe devoid

of water component would render the exercise unworkable. Therefore, the River Basin Development Authority should provide adequate water to the settlement areas. This could be done through the construction of simple earth dams for the pastoral herds and the drilling of hand pump boreholes for the pastoral Fulbe and other communities.

Group of pastoral Fulbe should be assigned to a certain number of dams to be purely dictated by their herd size holding. The pastoral Fulbe and farmers should be involved in the maintenance of these dams. It is important to re-iterate that, maintenance of these simple earthdams is very important for in chapter four, it was clearly established that the unmaintained earthdams in Mayo-Ine Project are responsible for some cattle diseases (Liver-fluke in particular). Therefore, this situation should be avoided.

5.6 Other Important Infrastructural Support Services For The Programme

5.6.1 Provision Of Functional education to the pastoral fulbe children and adults.

As was analysed in chapter three (table 3.6) about 76% pastoral Fulbe had no education and 22% had Quranic education it is therefore necessary to direct education to adult Fulbe men and women so as to enhance the success of this programme. The type of education recommended here is one in which issues affecting their pastoral life, home economics and management are taught.

schools should also be established simultaneously with other activities so that the children of the pastoral Fulbe could improve on their animal husbandry knowledge. As far as possible, these schools should be provided in strategic locations for the children. However, the children of the pastoral Fulbe should be encouraged to attend school with the children of the farmers so as to build understanding and cooperation from tender age provided the curriculum for the pastoral Fulbe will remain intact.

The pastoral Fulbe generally wanted teachers who can understand their language and know how to handle their children. Over time, more Fulbe children should be encouraged to take up veterinary training so as to link the traditional practices. Training should cover subjects like breeding, feeding, marketing, range management, economics, animal disease control and of course general agriculture.

For the Fulbe adults and women, people with basic understanding of their culture and language must be employed and trained in extension methods to carry through the initial phase. Visual aid materials such as mobile cinema, the Radio and group demonstrations should be used to introduce the advantages of modern improved livestock production practices to them. The enthusiastic responses of the pastoral Fulbe herdsmen to some pastoral Fulbe students who helped to administer my research questionnaires for this study demonstrate

the trust and willingness to cooperate. This will be enhanced when Fulbe kinsmen are themselves employed to extend new techniques to them.

The education of women should include how to improve the processing and preserving of dairy products, child care and other important home economic activities. It is therefore, strongly recommended that the River Basin Authority should recruit the right calibre personnel to implement the educational aspect of this programme.

5.6.2 *Information and Advisory Services*

During the field survey, discussions with respondents made it clear that 10% (chapter four) are not aware of the existence of the River Basin Authority. For those who are aware (86%), they are unaware that few earthdams and some extension services exist.

Therefore an information service centre is necessary to assist coordinate this programme. Such a service centre, if successful, could eventually be extended to cover not only the dissemination of information in relation to more general aspects of livestock production but also the collection and transfer of data concerning local issues affecting the pastoral economy.

A public enlightenment programme should also be identified by the Authority on the need for mutual co-existence between pastoral Fulbe, farmers, the

Authority, law-enforcement agencies and local leadership.

5.6.3 Establishment Of Agro-Allied, And Dairy Processing Plants

For the expected increase in agricultural and livestock products, establishment of processing plants by the River Basin Authority is necessary. Since the raw materials will largely come from the pastoral Fulbe and farmers, they should be fully involved in the planning, implementing and management of the industries. They should be encouraged to have shares in the industries. This will boost their morale and encourage them to participate actively.

The agro-allied industries should have the capabilities for using offals, crop-residues and other by-products that could be blended and compounded into rations for cattle nutrition. These would then come from both the outgrowers within the River Basin Authority and those outside it. The processed cattle feeds should be sold to the pastoral Fulbe and farmers at a subsidy content not exceeding 10% in order to reduce the possibilities of hoarding and black-marketeering.

Meat and Dairy processing plants should be established by the Authority to cater for fattened bulls by farmers and pastoral Fulbe and for the expected rise in milk production, a processing factory would encourage pastoral Fulbe to sell in large quantities thereby raising their income. Collection vans should be readily available so as to facilitate supply to the factories and that will

further encourage pastoral Fulbe to supply more of the raw materials.

The River Basin Authority should plan a network of milk collection centres to span the areas where the herdsmen are concentrated. With the expected power generation from dams, it should be possible for the Authority to install refrigerated tanks so that milk could be collected and stored for a day or two until an economic load is available for refrigerated tructs to pick up in a well worked-out milk route. Therefore, processing freshmilk into homogenised milk and other products in a number of locations in the Authority's projects should be possible.

The Authority should be able to establish reliable markets for these products. Other than the expected local markets, it is expected that, these products will be sold to other parts of this country since milk and meat are still imported in large quantities from the industrial countries of the World. However, markets for cattle, unprocessed dairy products from pastoral Fulbe, Grains and other necessities of life are expected to be developed by the Authority and handed to farmers and pastoral Fulbe for maintenance.

5.6.4 Livestock service centre

The need for a livestock service centre in a rural development programme of this nature may not be over emphasized. All interviews with pastoral Fulbe indicated

that a livestock service centre selling drugs, feeds, mineral supplements and traction equipment would find a ready market. Pastoral Fulbe everywhere expressed willingness to pay for imputs if they were readily available. Such a centre can go a long way in keeping pastoral Fulbe within their settlement areas.

It was clear from the data analysis in chapter four that, the River Basin Authority could not provide supplementary feed, salt licks, and only negligible provision of water to the pastoral Fulbe. Therefore, it is necessary that these services should be made more regular and in large quantities. Diagnostic laboratories and treatment clinics should be established and be properly equiped to provide the expected increase in services demanded by settling herdsmen. Usually, sedentary herds are prone to disease build up and the pastoral Fulbe, being attached to their cattle as main source of wealth and pride would not like to risk complete destruction of the herd. For centuries, his 'fool proof' approach was to move out to disease free areas. To stop this perpetual movement, the Authority must continuously assure them of top level health care for their cattle.

Officials of the veterinary services regularly stated that problems of communication and lack of transport, fridges and drugs prevented them from offering adequate services to livestock owners. Therefore, the River Basin Authority should provide adequate drugs

storage facilities and also improve the compiling and keeping of inoculation records. The availability of vaccines and drugs and their effective administration by veterinary extension staff, would have a significant effect in reducing cattle mortality and thus increasing production. Therefore, the direct sale of proprietary medicines to land-owners through the livestock centre might act to prevent supply bottlenecks from causing unnecessary stock losses.

The livestock centre is also expected to ensure that, stagnant water (earth dams, reservoirs etc) are free of liver fluke, chemical poison, worms, etc. which were identified as common diseases causing deaths of cattle. From time to time, cupper sulphate ($Cu\ SO_4$) could be used to serve as a control measure, Alternatively pastoral Fulbe could be taught simpler control systems like picking of the snails which are vectors carrying the disease and Bats or Ducks could be brought near such areas to pick the snails. The centre should ensure regular de-warming of the cattle atleast twice a year but most preferable four times a year (interview with one of the Authority's Veterinary Officers).

The Authority should also construct adequate cattle Dips within the settlements of pastoral Fulbe so as to eliminate external parasites such as ticks, mites, fleas, lice etc. pastoral Fulbe should be trained so that dipping of cattle could be done regularly. The livestock centre in conjunction with pastoral Fulbe will ensure

proper maintenance of the dips.

Human health centre should also be constructed at a strategic place where pastoral Fulbe and other rural communities could have access to it easily.

5.6.5 Livestock Extension Programmes

The recommendations made so far, will require much education and transformation to change pastoral Fulbe and finally integrate them into the Authority's programmes. They must be convinced that the gains from settling exceed those of non-settled life. The farming communities must also be educated to see the need for good neighbourliness with the cattle rearers. In the light of this, the River Basin Authority should have a well-organized livestock extension programme with well trained and competent fleet of extension workers.

The development of the extension staff should have some biases on cattle management system of the pastoral Fulbe. Such livestock extension kits should be suitable to the knowledge, skills and attitudes of the pastoral Fulbe. The kits or packages should include types of feeds, how to make and preserve silage, cultivation of some crops solely for their crop residues or for silage purposes, range-land and pasture management, marketing information, channels of inputs procurement and how to utilize and preserve the proceed inputs, symptoms of various diseases, performances of exotic, upgraded and crossbreeds, home management, modern cattle husbandry

system, advantages of forming cooperatives, uses of high-yielding varieties and the utilization of some working bulls. The Authority should also develop suitable packages for the pastoral Fulbe women in their dairy processing, marketing and home management activities.

It is also important that, farmers be educated on the costs and returns of growing crops solely for its residues or silage preparation purposes, pasture development for fodder sales to the pastoral Fulbe, processing of some crop residues, offals and other by-products from their harvested crops for sale to the pastoral Fulbe and the need for modern crop husbandry.

It may be important to note that, in inducing extension staff to remain in close contact with the herdsmen, a key element is the provision of an acceptable level of welfare services and transport for staff and their families.

5.6.6 Security System, Banking And Credit Schemes

Field investigation showed that, cattle theft is a common phenomenon usually organised and executed by bandits. The pastoral Fulbe are helpless about this situation. With more pastoral Fulbe settling, it is expected that, the banditary situation would be on the increase. Like the problems of water, pasture and diseases, the problem of cattle theft also makes pastoral Fulbe migrate to areas free from such raids. Therefore, it is recommended that a police post with sub-stations

be located at strategic places to counter the menace of bandits not only for the pastoral Fulbe but for the other communities too. This will also enhance law and order in the settlement areas.

Rural Banks should be introduced to the settlement areas of the pastoral Fulbe. It is hoped that, improved banking services would provide a degree of security and might encourage pastoral Fulbe to diversify their spending and stimulate other sections of the economy rather than investing all their capital in livestock. Effective extension and educational services on banking activities would encourage them to participate.

The Authority should arrange and act as guarantor for bank loans to pastoral Fulbe for fattening and in maintenance of fodder banks. This should be extended to the Authority's participating farmers. The loan package should include feed and veterinary imputs. Such loans should be repaid fully in three years beginning from the second year after beneficiaries might have consolidated pasture development. The Authority being a service organization or agency, should subsidize the interest to beneficiaries until they are fully established and can therefore stand on their own.

5.7 Farmer/Pastoral Fulbe Participation In Decision Making And Plan Implementation

Several government projects have failed in this country because they lack public participation. Therefore,

for successful settling and integrating pastoral Fulbe into the Authority's programmes, the target group (pastoral Fulbe and the farmers)should be involved in the selection, design, and implementation processes of the programme.

It was observed during the field survey that, the pastoral fulbe groups spoke with common voice through their group head (Ardo) except on Questionnaire interviews where heads of household spoke for the family. It would therefore be possible to reach them effectively through involvement of their leaders (representatives) in decision-making at various levels. It is important to obtain the pastoral Fulbe and farmers point of view in order to avoid the tendency of planning outside their needs and preferences. Not only should the Authority be genuinely helping the pastoral Fulbe but they should see the Authority as honestly helping.

A common exhortation as observed by Awogbade(1986) is that pastoral Fulbe should have a greater say in planning their own development. This can be achieved by arrangements whereby the maximum tasks and functions are carried out by the pastoral Fulbe themselves. Although, some relevant facts of modern management, particularly in the veterinary field, are increasingly being accepted by the pastoral Fulbe, the rate of adoption of modern productive techniques and its concomitant commercialization of cattle-keeping can only be gradually achieved (Ibid).

With the involvement of farmers and pastoral Fulbe in this programme, it is hoped that, the eroded symbiotic relationship between them would gradually be regained thereby improving productive levels of the groups.

5.8 Animal Traction Technology

With the introduction of second Tier Foreign Exchange Market (SFEM), tractors which previously cost in the region of ₦19,000.00 have risen in price to ₦98,000.00 (416% rise) and there has been a corresponding rise in the price of all implements and trailers (Leach, 1987). This has led to a situation where it is extremely difficult to justify, financially, the use of such expensive equipment for crop production.

The annual charge per hectare for cultivation above is estimated at about ₦390.00 (Ibid). This excludes cost of implements.

The total cost per annum, writing off equipment over four years is estimated at ₦650.00. On the other hand, a pair of work oxen, can carry out all cultivations on 4 hectares at the cost of ₦160.00 (or at ₦40.00 per ha) (Ibid). In addition to this, there is the value of manure produced.

Based on the above analysis, it becomes clear that, it is much more attractive financially and is to the target groups' (farmers and pastoral Fulbe) economic benefit to use draught oxen.

The River Basin Authority should therefore persue the animal traction technology very vigorously. Extension efforts to encourage the use of draught oxen should include training unit since it appears that knowledge of animal traction methods does not cut across ethnic boundaries and the funding of a small trade school teaching artisans to convert disused chasis into ox-carts. Certainly, more readily available local stocks of ploughs and simple demonstrations to livestock owners would suffice to make pastoral Fulbe and farmers familiar with the concept.

Figure 16 illustrates the necessary linkages of the settlement and integration model recommended in this chapter.

5.9 Strategy For The Implementation Of The Plan Proposal

Experience has shown in this country that, several well planned projects never saw the 'light of day' simply because they are either never implemented at all or are poorly implemented thereby yielding no good results. Others are done half way and abandoned. Our national development plans could surely serve as clear testimony to these allegations. It is in the light of the above that it becomes necessary to recommend policy implementation to the River Basin Authority on the proposed settlement and integration model of the pastoral Fulbe.

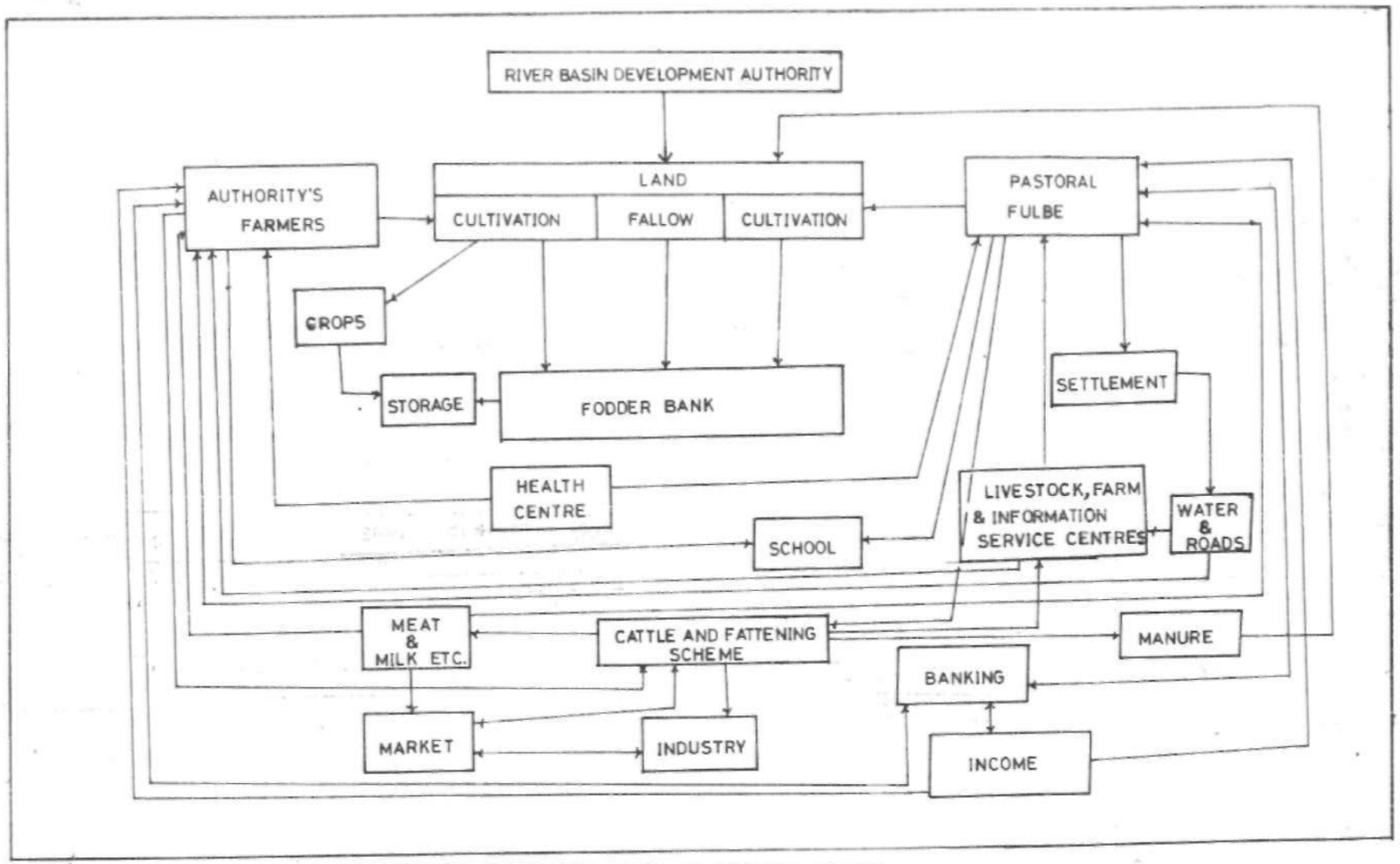


FIG. 16 THE SETTLEMENT AND INTEGRATION MODEL OF PASTORAL FULBE
SOURCE: Author's Formulation, 1987

5.9.1 Schedule For Execution Of The Proposed Model

The River Basin Development Authority should implement the model in four phases spread over a period of five years.

Phase One: Phase one which is the preparatory phase should be carried out in the first two years of the five year plan comprising the following activities: Conducting and completing all relevant studies associated with the programme; identifying and demarcating suitable areas for the settlement of the pastoral Fulbe; water development both for livestock and human consumption; establishing grazing corridors and the provision of veterinary health services. Also, the training of pioneer extension workers, recruitment of the required technical staff and the establishment of schools for the pastoral Fulbe children should be undertaken. These are considered pre-requisites for the take off of the programme. Construction of the livestock and information service centre should also commence during this phase but may not be completed. Selection and allocation of plots to the first batch of pastoral Fulbe should be carried out towards the end of this phase hoping that the pre-requisites for moving in are ready by then.

Phase Two: The second phase which should commence in the third year of the five year plan should continue with the following activities: Movement of the first batch of the pastoral Fulbe into settlement areas;

completion of the livestock and information service centres and commissioning them; Commencing of the fattening, pasture development and crop cultivation schemes by both pastoral Fulbe and farmers and the completion of markets and police posts. Training of the pastoral Fulbe and farmers on the animal traction technology and the construction of milk collection centres should also commence during this phase.

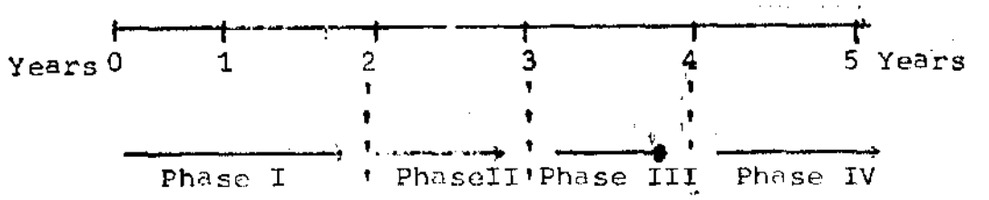
Phase Three: In phase three (fourth year) cultivation by Draught oxen (animal traction) should take off fully, construction of milk collection centres should be completed and more pastoral Fulbe are expected to move into the settlement areas. Rural Banks and credit scheme activities should be introduced during this phase. Also to commence during this phase are the agro-allied and dairy processing plants.

Phase Four: The processing plants are expected to be completed and commissioned during this phase which is in the last (fifth) year of the targeted period. Therefore, it is expected that by the end of this phase, the model is fully operational.

The Authority's monitoring and evaluation team in which pastoral Fulbe and farmers are participating will be assessing and reporting progress made and problems encountered in each of the four phases discussed above.

on page 149

The diagram illustrates the time schedule discussed above:



5.9.2 Institutional Management Of The Model

Implementation of the model should be undertaken by three main committees and four other specialised committees as shown in figure 17.

The three main committees are policy committee (PC), Grazing Management Committee (GMC) and Community Management Committee(CMC) with the following compositions and functions:

5.9.3 Policy Committee(PC)

Compositon: The committee should comprise the following:

1.	General Manager, Upper Benue	-	Chairman
2.	Emir or his representative	-	Member
3.	Chief Veterinary Officer	-	Member
4.	Chief Agricultural Officer	-	Member
5.	Chief Range Management Officer	-	Member
6.	Chief Irrigation Engineer	-	Member
7.	Permanent Secretary, Ministry of Agriculture	-	Member
8.	Chairmen, Local Governments where Projects are located	-	Member
9.	Two senior 'Ardos' and Representative of Farmers	-	Member
10.	Chief Livestock Officer	-	Secretary.

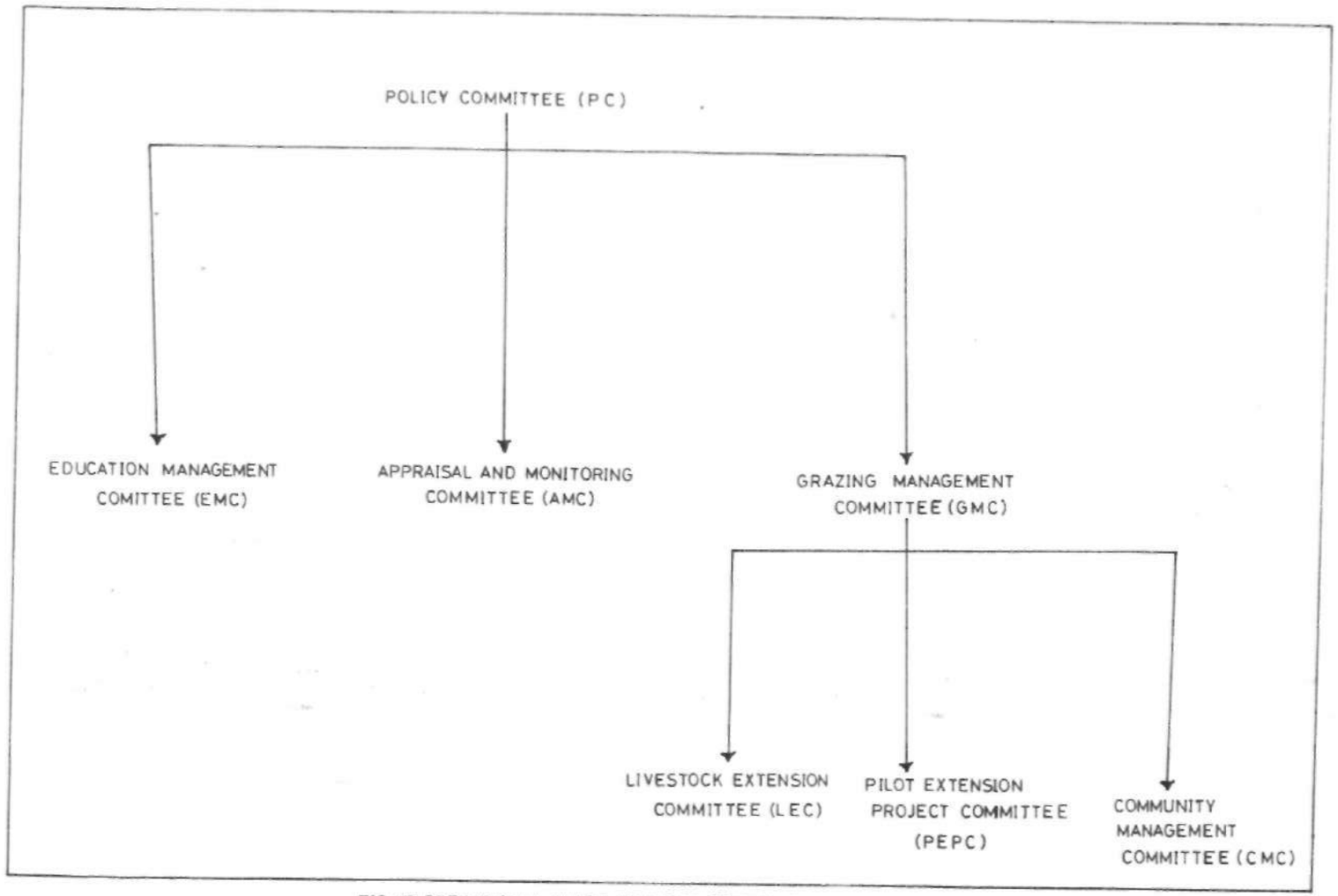


FIG. 17 OPERATIONAL CHART FOR THE SETTLEMENT AND INTEGRATION PROGRAMME

SOURCE: Author's Formulation 1987

Function: The primary function of this committee is to formulate and define development policy ensuring that the management committee has the means to execute such policy. The committee will also be responsible for:

1. Working out land tenure system and the form and conditions of settlement and integration of the pastoral Fulbe;
2. Drawing up and approving a management plan for the programme;
3. Drawing up and approving a farm plan for the pastoral Fulbe and farmers;
4. Approving infrastructural development;
5. Monitoring livestock numbers, health, watering points, human population and range condition;
6. Establishing a management committee and determining its composition and function;
7. Based on reports from the management committee (MC), investigate breaches of regulations and undertake disciplinary measures as appropriate; and
8. Determining project's carrying capacity, setting and controlling stocking rates.

5.9.4 Grazing Management Committee

Composition:

1.	Project Supervisor	-	Chairman
2.	Village head(s) in the project Area	-	Member

3. District Head(s) in the project Area - Member
4. Representatives of Pastoral Fulbe(Ardo(s)) - Member
5. Representatives of Authority's participating farmers - Member
6. Veterinary/Livestock Officer - Member
7. Range Management Officer - Member
8. Head of National Resources Department(Local Government) - Secretary.

Function: The committee among other things is to advise and assist on matters affecting the pastoral Fulbe and would be the overall management body of the project particularly the implementation of decisions taken by the Policy Committee. Other functions include:

1. Monitoring use of grazing resources and water supply;
2. Receive day-to-day implementation problems from community management committee either for prompt actions or upward transmission to policy committee as the case may be; and
3. Make recommendations on policy and management to the policy committee.

5.9.5: Community Management Committee

A community management committee should be formed in each project area under the chairmanship of one of the 'Ardos'.

Composition:

1. All 'Ardos' among whom one of them shall be the Chairman
2. Selected heads of domestic unit.
3. Selected Fulbe elders
4. Representatives of the River Basin Authority, State and local governments.
5. Representatives of Authority's Farmers.

The committee's operation would be restricted to-day-day management of each project, ensure equitable distribution of imputs and reporting all constraints to the Management Committee (MC).

Other Committees: In addition to the main committees, the River Basin Authority should form some specialised committees to support the main committees. These committees should include Livestock Extension Committee (LEC), Pilot Extension Project Committee(PEPC), Appraisal and Monitoring Committee (AMC), and Education Committee (EC).

5.9.6 Livestock Extension Committee (LEC)

The livestock extension committee which is intended to maximise contact with pastoral Fulbe and farmers, should be organized on a modular basis, each module consisting of a veterinary or livestock assistant, inoculators and a labourer with equipment and supplies. A group of modules being supervised by a veterinary

officer and having representatives of pastoral Fulbe and farmers as members. The committee will be responsible for supervising a predetermined number of technical models and giving extension advice and could for example administer either 75 settled pastoral Fulbe schemes, or 75 mixed farming loans or 100 cattle fattening loans. The number of modules would be determined by local needs and resources and the size of the target population. This committee will to a large extent be responsible for disease control and record keeping. It will be accountable to the head of the livestock Extension Centre.

5.9.7: Pilot Extension Project Committee

The Authority should form and charge this committee with the responsibility of investigating options such as information services, land right issues, credit supervision, marketing and areas of further research. It would compose of information officer, Rural Development Officer, Marketing Officer, Loan Officer and representatives of pastoral Fulbe and farmers. The information officer with some assistants could from time to time organise relevant film shows and assist in the organization of field days as part of the committee's activities.

5.9.8 Appraisal And Monitoring Committee

This committee should comprise of:

1. Chief Monitoring & Evaluation Officer - Chairman

2. Two Planning Officers one of whom should be the secretary of the committee.
3. Two Monitoring Officers - Member
4. One Rural Development Administrator - Member
5. Representatives of Fulbe and Farmers - Member

The main function of the committee is the evaluation of the impact of the programme on the target group and the environment. There should be quarterly, half-yearly and annual assessment of the programme and reporting should be done directly to the Policy Committee (PC).

5.9.9 Education management committee

In view of the fact that, educating pastoral Fulbe adults (men and women) and children is expected to accelerate adoption of new livestock production techniques, a committee is recommended to ensure strict adherence to the purposefully designed syllabus. The committee is also expected to make independent assessment of the achievement of the schools and to recommend areas of improvement.

The committee will comprise the following:

1. Chairmen of the local governments concerned among whom one of them will be the Chairman of the committee at a time.
2. Representative of the Authority - Secretary
3. Head of Local Government Education Departments - Member.

4. Representative of the State Ministry of Education Department - Member
5. All head of the schools established for the purpose of this programme
6. 'Ardos' and Representatives of farmers.

The committee will be directly responsible to the Policy Committee (PC). Assessment and reporting should be on quarterly basis.

5.10 Livestock And Agricultural Shows And Field Days

To accelerate the implementation of this settlement and integration model, the Authority should introduce livestock and agricultural shows where farm produce and fattened bulls could be displayed and prices given to best producers as a sort of encouragement to them and others. Invitation should be extended beyond project area so that more farmers and pastoral Fulbe should be attracted to join the programme. The ultimate aim of this model is to settle as many pastoral Fulbe as it can within the Authority's projects and integrate them into its programmes. Invitation should also be extended to other River Basin Development Authorities particularly those within the same ecological zone with Upper Benue River Basin Development Authority. This would easily give room for the replication of the model in those River Basin Authorities.

Similarly, field days should be organized at intervals with similar wide-spread invitation. During this occasion, demonstration of modern livestock production techniques will be carried out by the Authority's extension workers. Such demonstrations could centre on pasture and fodder bank development, effective use of draught - oxen, improved methods of processing and preserving dairy products, application of modern crop production inputs, grains and crop residue storage etc. This will not only improve those already benefiting but would also attract others to join the programme. Workshops and seminars should also be organized from time to time to improve skill of beneficiaries and Extension workers of the Authority.

Involvement of pastoral Fulbe and farmers in all the processes of plan implementation would make the programme more acceptable and workable to them. The aim should be to afford pastoral Fulbe the opportunity to decide the place and direction of their own development.

CHAPTER SIX
SUMMARY AND CONCLUSIONS

6.1 Summary

The purpose of this research was to examine the effects and impact of Upper Benue River Basin Development Authority's programmes on the entire life cycle of the pastoral Fulbe with a view to evolving an efficient integrative model and to propose a settlement plan for them based on the research findings. Two major irrigation projects (Mayo-Ine and Lower Gongola) of the Authority were selected for the study.

In all 200 copies of Questionnaires were administered to 200 respondents. One hundred and fifty copies of a separate set of Questionnaire were administered to pastoral Fulbe while 50 copies of another separate set of Questionnaire were also administered to farmers. Descriptive, inferential statistical methods and "Time Series" to present analysis graphically were used in the data analysis.

6.2 Major Research Findings

In an attempt to achieve the stated aim of this study via one of the objectives which deals with the socio-economic settings of the pastoral Fulbe; the family was identified as the most important economic and socio-political unit of organization among the pastoral Fulbe. Production and consumption decisions are made within the family structure. The family also

forms the most important source of labour, moral support and protection.

Pastoral Fulbe in the study area have unique ways of dividing responsibilities along male/female and age lines. Pastoral Fulbe were also found to value cattle as a symbol of status, as coinage in business transactions and for the supply of food (milk, cheese and meat). Cattle are also used directly or sold to pay for fines for infringment of local laws.

Two groups of pastoral Fulbe were identified during the field survey. On the one hand are the semi settled pastoral Fulbe who usually split their herds for dry season herding while on the other hand are the nomadic Fulbe who move in total. Also identified were the various clans existing within these groups for the purpose of planning the pattern of their settlement.

About 77% of the pastoral Fulbe in the study area own 1 - 2 herds of cattle with a mean of 71 heads of cattle per herd (Appendix 4).

Another important objective of the study is the appraisal of existing land policies within the River Basin Development Authority. The Authority's present land-use policy was found to be incompatable with pastoral economy. Large scale farmers and Agro-Allied companies are taking over grazing lands. The River Basin Authority has no land policy which is geared towards improving grazing activities of the pastoral

Fulbe. Instead, the pastoral Fulbe are being marginalised in the face of large expanses of land being acquired by these large scale farmers and the cattle ranches established by the Authority in Yelwa, Cham and Jama'are.

Closely associated with the above is the objective which identified and evaluated Authority's irrigation activities. Here, the research showed that, areas identified and planned for irrigation activities by the River Basin Authority are the traditional dry season grazing areas for the pastoral Fulbe as illustrated by Figures 11 and 12. The Authority has neither plan for alternative grazing areas for the pastoral Fulbe as the traditional grazing lands are being taken over nor has it plan for integrating them within the Authority's programmes. It is therefore obvious that pastoral Fulbe are losing substantial grazing lands which as a result is increasing conflicts with other land users in particular farmers. The Authority's existing land policies and the identified irrigable areas confirm hypothesis number one in chapter one which states that 'Grazing lands have increasingly become inaccessible to pastoral Fulbe'.

The field survey further showed that, lack of title to land and pasture were ranked first among several factors responsible for constant migration of the pastoral Fulbe. This was closely followed by lack of adequate water during dry season. If the above facilities are

provided along with others, it is believed that pastoral Fulbe will settle naturally. The notion held by many researchers that, cultural heritage is a strong factor behind pastoral Fulbe frequent movements has been proved otherwise by this study. In fact, 85% of the sampled pastoral Fulbe are ready to settle if grazing facilities are improved.

Field findings also showed that no significant services were provided to the pastoral Fulbe by the River Basin Authority since its inception about 11 years ago (see table 4.2). Instead, the pastoral Fulbe are suffering increasing alienation from land and water resources, increasing conflict with farmers, emergence of new cattle diseases and/or increase in the existing cattle diseases as shown in figure 15. In fact, figure 15 further confirms hypothesis number four which alleged that, 'there is a steady increase in the incidence of cattle diseases particularly around flooded areas of Dams inpoundments'.

Another important finding during the survey is that, results from respondents, courts and police stations confirmed increase in conflict between pastoral Fulbe and farmers since the inception of the River Basin Development Authority. This tests and confirmed hypothesis number three in chapter one which hypothesised that 'the traditional symbiotic relationships between the pastoral Fulbe and farmers are increasingly

being eroded'.

With less access to grazing land, water, increase in animal diseases, and increase in conflict with farmers, the case of lower cattle fertility, higher cattle mortality and lesser dairy products was reported by pastoral Fulbe and confirmed by veterinary zonal offices. This in effect confirmed hypothesis number two which states that 'the socio-economic life of the pastoral Fulbe has worsened'.

Pastoral Fulbe opined during the survey that, the River Basin Development Authority is capable of settling and integrating them into its programmes by providing settlement areas, adequate water, veterinary services, and by arranging for farm residues and the provision of effective livestock extension services.

Pastoral Fulbe indicated willingness to participate in the planning and implementation processes of settling and integrating them within the Authority's programmes. They are of the opinion that, their leaders (Ardos) should represent them.

6.3 The Integration And Settlement Model

Based on the above findings, a settlement and integration model proposal aimed at settling and integrating the pastoral Fulbe within the Authority's programmes was recommended. Domestic grouping was selected as against territorial grouping. as the settlement programme which suits the pastoral Fulbe

socio-cultural dynamics. A strong reason for rejecting territorial grouping was that the pastoral Fulbe's political, social, and economic controls are very difficult to maintain, thereby making it unlikely that such groups can meet the economic and management requirements of the programme. On the other hand, if the domestic (family) unit is used, there is the advantage that the household head already holds socio-economic and political authority. The house hold organization structure makes it easier to secure tenure.

It has been proposed that pastoral Fulbe should be settled within the Authority's projects as opined by the two groups. Each household will be allocated to between 210 - 280 hectares of land to be demarcated into residential, cultivation, pasture development and herd plots. Communal grazing areas have been proposed for upland and fadama areas of the Authority's projects.

Live fencing has been recommended for the pasture development and fodder bank so as to minimise cost. When fully developed, the fodder bank is expected to sustain cattle and other livestock throughout dry season (a season marked with pastoral Fulbe migration in search of pasture). Both pastoral Fulbe and farmers would be encouraged to engage in pasture development. Grazing corridors have been proposed to link settlement and grazing areas. Water would be supplied all over the grazing lands and in the pastoral Fulbe settlements.

Other infrastructural support system considered important for the programme are the provision of functional education to the pastoral Fulbe's children, adult Fulbe men and women, information and advisory services, the establishment of dairy and milk processing plants with concrete milk collection centres and markets, livestock extension programmes, livestock service centres, and the introduction of security system, banking and credit schemes.

Animal traction as an alternative to tractorization has been suggested. Involving the pastoral Fulbe and farmers in decision making and plan implementation has been proposed to replace the present system whereby both groups are being by passed.

To enhance integration, it has been recommended that, each farmer who is allocated land should be encouraged to keep acceptable number of cattle. Pasture and fodder bank development will be made an integral part of the agricultural package to be undertaken by pastoral Fulbe and farmers. Pastoral Fulbe will be encouraged to take to crop cultivation for their subsistence and crop residues.

Farmers would be convinced to allow the grazing of their crop residues by the pastoral Fulbe cattle in return for the manure left behind by the cattle. This will further improve the eroded symbiotic relationship between the two groups. Exchange or trade between them will be accelerated by the Authority.

To avoid rushing or delaying in the implementation of the plan proposal, four phases spread over five years have been recommended within which to complete the execution of all the packages of the model. The target capacity of the number of pastoral Fulbe settling in the study areas are also expected to be met. Upper Benue River Basin Development Authority would be the implementing agency via various committtees recommended in chapter five.

6.4 Conclusions

The system of cattle rearing in Nigeria is predominantly extensive. This entails the pastoral Fulbe system of livestock husbandry, based mainly on traditional methods and principles. This system has not only failed to improve the standard of living of some rural dwellers but also failed to bring about the self-sufficiency in meat production in Nigeria. Also, the extensive system is developing serious frictions between the pastoral Fulbe and farmers in various parts of Nigeria. Apart from this, more and more land is being converted for agricultural purposes leaving very little room for the pastoral Fulbe to graze their cattle. The situation is more serious with the large scale mechanised irrigation farming being undertaken by River Basin Development Authorities, Agricultural Development Projects and other land users.

The study attempted examining the extent of this situation in Upper Benue River Basin Development Authority and recommended a land-use planning mechanism which may gradually minimise and ultimately eliminate the problem.

The situation whereby pastoralism is left to face obsolescence on its own is ethically wrong. This is because the pastoral activity like any other activity needs to be supported in order to develop meaningfully. Therefore, all is required of the pastoral Fulbe productive system is refinement and upgrading.

This is attainable if it is recognized that the pastoral Fulbe themselves want to settle down and modernize. The major limitations have been identified as lack of title to land, pasture, water and other important infrastructural support systems. This calls for the intervention of the Nigerian state. The intervention suggested here is via River Basin Development Authorities (a case study of Upper Benue) and are in line with the provision of titleship on land and other necessary grazing facilities aimed at modernizing the livestock industry. The suggested modality is that land should be acquired so that the pastoral Fulbe are fully settled and integrated into the programmes of Upper Benue River Basin Development Authority.

Steps recommended are in line with land acquisition

and demarcation. Routes are to be properly demarcated, watering points developed, integrated use of land and crop residues will be persued vigorously together with intensified livestock extension. Pasture and fodder bank development and credits will all be incorporated in the programme along with others. Integration of the pastoral Fulbe and non-pastoralists has been considered fully. Pastoral Fulbe are to be settled within the Authority's projects not far away from farmers.

Pastoral Fulbe are rational people who can enter into co-management, offering minimum risk and obvious potentials of fulfilments of minimum institutional supports (Okaiyeto, 1981). This is expected to transform our stage of cattle production system from the concepts of 'marginalising' and 'enclaving' the pastoral Fulbe to placing responsibility of their pastures, rangelands, and farm plots with them. An integrated approach would be less meaningful if enclave system of rural development is perpetuated.

Therefore, to accelerate the improvement of the pastoral Fulbe's traditional system in the livestock industry, settlement and integration of this group of rural population is encouraged. This is expected to pave way for modernization of the cattle industry. The process will eventually provide strong economic base, establish self-reliance and self-sufficiency. The settlement and integration model is geared towards

improving the cattle industry and ultimately develop the rural sector. It is recommended that, other River Basin Development Authorities in similar ecological zones in the country to replicate this model with some modifications so as to merge with pastoral Fulbe socio-cultural settings in those areas. These River Basins are the Sokoto-Rima River Basin, Hadeijia-Jama'are River Basin, Chad Basin, Lower Benue River Basin, and Niger River Basin Development Authorities. The River Basin Development Authorities are of prime important because their areas of jurisdiction include most of the dry season pasture and rangelands open to the pastoral Fulbe herds. It is therefore expected that the findings in this study are applicable to the River Basin Authorities and perhaps a lot more. Adopting this model is expected to drastically minimise and ultimately be a panacea to problems of pastoral activities in this country, thereby enhancing the livestock industry.

6.5 Directions For Future Research

Adequate resource, and socio-economic surveys should be carried out in each project area on pastoral Fulbe and farmers. Although ASHCROFT and G.F. APPIO (Nig) LTD. had conducted some pre-feasibility studies in the study area, but those studies should be upgraded to incorporate the proposed settlement and integration model. Necessary ecological studies should also be conducted for experience has shown that past efforts on the settlement of pastoral Fulbe failed to consider this

as an important factor. Such studies will further determine the viability of the programme in terms of resources and views of those concerned. This calls for permanent engagement of Rural Development Planners, Rural Sociologists, Anthropologists, Economists and Ecologists in the projects' activities. This group of specialists will in addition from time to time appraise pastoral Fulbe and farmers' opinions on the programme and if the need arises certain aspects of the proposals are either reviewed or revised as the case may be in conformity with the views of the beneficiaries.

The studies should as much as possible involve pastoral Fulbe and farmers who should participate in the entire research process. The aim is actually self clarification of community values and preferences. The researchers, policy planners, pastoral Fulbe and farmers should work together in the conceptualization, design, collection and analysis of the data, and posing of solutions to problems. There is no doubt, through such a method as the participant research, adequate description of the pastoral Fulbe livestock production systems as well as effective range land utilization procedure can be fully undertaken and understood, plus identifying the needs of producers themselves.

An accurate and detailed census of pastoral Fulbe with the main objective of identifying herd distribution and ownership structure, herd composition and herd size is necessary for the successful take off of this programme.

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Appendix 1

Mean for number of wives

The mean ($\bar{X}$) could be derived using the formula $\bar{X} = Xm + \frac{Ef(X - Xm)}{N}$

Where $\bar{X}$ = Mean

Xm = assumed mean

f = frequency distribution

x = variable

N = Total sum of all the frequency distributions.

	x	f	(x-xm)	f(x-xm)
∴	1	69	- 22	- 1518
xm=23	2	45	- 21	- 945
	3	23	- 20	- 460
	4	10	- 19	- 190
		N=147		Ef(x-xm)=-3113

$\therefore \bar{x} = 23 - \frac{3113}{147}$

$= 23 - 21.18$

$= 1.82 \simeq 2$

Appendix 2

Mean for number of children

Class interval	f	Midpoint (x)	x-xm	f(x-xm)
1 - 5	71	3	- 10	-710
6 - 10	48	8	- 5	-240
11 - 15	11	13	0	0
16 - 20	8	18	5	40
	N=138			Ef(x-xm)=910

xm = 13

$$\therefore \quad \bar{x} = 13 - \frac{910}{138}$$

$$= 13 - 6.59$$

$$= 6.41 \approx 6$$

Appendix 3

Mean for number of dependants

Class Internal	f	Midpoint(x)	x-xm	f(x-xm)
1 - 4	61	2.5	- 4	- 244
5 - 8	14	6.5	0	0
9 -12	4	11.5	5	- 20
	N=79		Ef(x-xm) = -	264

xm = 6.5

$$\therefore \quad \bar{x} = 6.5 - \frac{264}{79}$$

$$= 6.5 - 3.34$$

$$= 3.16 \simeq 3$$

Appendix 4

Mean holding per herd

Class interval	f	Midpoint(x)	x-xm	f(x-xm)
40 - 49	6	44.5	- 20	- 120
50 - 59	20	54.5	- 10	- 200
60 - 69	18	64.5	0	0
70 - 79	70	74.5	10	700
80 - 89	31	84.5	20	620
	N=145			Ef(x-xm)=1000

xm = 64.5

$$\therefore \quad \bar{x} = 64.5 + \frac{1000}{145}$$

$$= 64.5 + 6.9$$

$$= 71.4 \approx 71$$

Appendix 5

Standard Deviation for Mean Holding per herd

Formula $S = \sqrt{\frac{Ef(x-\bar{x})2}{N}}$ which follows thus;

f	Midpoint(x)	$(x-\bar{x})$	$(x-\bar{x})^2$	$f(x-\bar{x})^2$
6	44.5	-26.9	723.61	4341.66
20	54.5	-16.9	285.61	5712.20
18	64.5	- 6.9	47.61	856.70
70	74.5	3.1	9.61	672.70
31	84.5	13.1	171.61	5319.91
				16,903.37

N=145

$$\therefore S = \sqrt{\frac{16,903.37}{145}}$$

$$= \sqrt{116.58}$$

$$= 10.8$$

Appendix 6

Research Questionnaire (1)

Topic: River Basin Development Strategies And The Integration of Pastoral Fulani: A Case Study Of Upper Benue River Basin

Pastoral Fulani Interview Schedule

Project Area:.....

LGA: .....

Instruction:

Responses should be indicated by ticking the appropriate boxes provided. Written information should be recorded in the spaces provided. Additional information can however, be recorded on the attached blank sheets please.

A. General BackGround:

1. Sex: (a) Male ☐ (b) Female ☐

2. Age of Respondent: .....

3. Marital Status: (a) Married ☐ (b) Single ☐

(c) Divorced ☐ (d) Widower ☐

4. How many wives do you have ? .....

5. How many children do you have alive ? .....

6. Other than your wife/wives and child/children are some people living with you? (a) Yes ☐

(b) No ☐

7. If yes, how many of them ? .....

B. Educational BackGround:

8. Which of the following educational levels have you attained ?

(a) Adult - education ☐

(b) Primary but not completed ☐

(c) Completed Primary School ☐

(d) Post-Primary but not completed ☐

(e) Completed Post Primary ☐

(f) Quranic education ☐

(g) None at all ☐

9. Are your children attending school ? (a) Yes ☐

(b) No ☐

10. (If yes) where? .....

11. (If No) Why ? .....

C. Socio-Cultural And Livestock Matters:

12. Do you belong to any clan ? Yes ☐ (b) No ☐

13. What is the name of the clan ? .....

14. Of what significance is the clan to you: .....

.....

15. Which among the following type of leadership is obtained within your clan? (a) Ardo ☐ (b) Jauro ☐ (c) Sarkin Fulani ☐ (d) Lamido ☐ (e) Wakili ☐ (f) Others (Specify) .....

16. Through which of the following is conflict resolved within your clan? (a) Elders ☐ (b) Leaders ☐ (c) Law Courts ☐ (d) Mutuality ☐ (e) Others (Specify) .....

17. Rank the following roles which women play in the order of importance? (a) Children care ☐ (b) Fetching water & Firewood ☐ (c) Cooking ☐ (d) Building Huts ☐ (e) Milking cows ☐ (f) Making Milk & Milk Products ☐ (g) Herds Management ☐ (h) Others(Specify) .....

18. What types of seasons exist within your production cycle/year ?

Season	Months	Hausa	Fulfulde
1.			
2.			
3.			
4.			

19. How does each of the seasons influences your pastoral life ?

Season 1: .....
.....

Season 2: .....
.....
.....

Season 3: .....
.....
.....

Season 4: .....
.....
.....

20. Have you been altering your dry season routes?

(a) Yes ☐ (b) No ☐

21. If (Yes) Why? .....

.....

.....

If (No) Why? .....

.....

.....

22. Can you tell me the grazing routes and how these have been changing?

(a) From ..... To .....

(b) From ..... To .....

(c) From ..... To .....

(d) From ..... To .....

23. Have you been obtaining information about the availability of Pasture during dry season ? ....

.....

How? .....

.....

24. What is the longest distance you usually cover in search of fodder and water during dry season?

(a) Below 20km ▱

(b) 21 - 40km ▱

(c) 41 - 60km ▱

(d) 61 - 80km ▱

(e) 81 - 100km ▱

(f) Above 100km ▱

25. For how long have you been in your present settlement during: (a) Wet Season? .....

(b) Dry Season? .....

26. Which among the following reasons is the strongest factor behind your nomadic life ?

(a) Insearch of Pasture

(b) Insearch of Water

(c) Cultural heritage

(d) Others (Specify) .....

27. How many herds of cattle have you ?

(a) 1 - 2 ☐

(b) 3 - 4 ☐

(c) 5 - 6 ☐

(d) 7 - 8 ☐

(e) 9 - 10 ☐ (f) Others(Specify) .....

28. What is the average number of heads of cattle per herd?

(a) Below 50 ☐

(b) 51 - 60 ☐

(c) 61 - 70 ☐

(d) 71 - 80 ☐

(e) Over 80 ☐

(f) Others (Specify) .....

29. Which other ruminants do you maintain other than cattle?

(a) Sheep ☐ (b) Goat ☐

(c) Horse ☐ (d) Donkey ☐

(e) Others (Specify) .....

D. Services Enjoyed From Upper Benue & Other Government Agencies:

30. Do you know about the existence of Upper Benue (Hukuma Nadde Benue)?

(a) Yes ☐ (b) No ☐

31. Which of the following services are being provided by the River Basin Development Authority?

(a) Veterinary Services ☐

(b) Pasture and Water ☐

(c) Access Roads ☐

(d) Others (Specify) .....

32. What other sources of veterinary services are open to you?

(a) State Government ☐

(b) Local Government ☐

(c) Private Organization ☐

(d) Traditional Medicine ☐

E. Marketing of Livestock And Dairy Products:

33. What is the average cost of a cow/bull?

(a) About ₦500 ☐

(b) ₦600 - ₦800 ☐

(c) Over ₦800 ☐

34. Is the sale of milk and butter of any importance to the family ? (a) Yes ☐ (b) No ☐

(If Yes) Mention some of the importance? .....

.....

.....

35. Which markets do you sell dairy products? .....

36. When is demand for milk and butter:
(a) Highest? ..... (b) Lowest? .....

37. Since you change settlement as seasons change can you briefly tell me how this affects disposal (sale) of milk and butter? .....
.....
.....

38. Do you buy all your food stuff or you grow some?
.....
.....

39. If you grow some which are these ? .....
.....

F. Relationship with Farmers:

40. Is your relationship with farmers:
(a) Cordial ☐
(b) Fairly cordial ☐
(c) Moderately cordial ☐
(d) Always in conflict ☐

41. Rank the main sources of conflict:
(a) Due to damage of crops by cattle ☐
(b) Location of farms on cattle routes ☐
(c) Blockage of water points by farmers ☐
(d) Location of farms near your settlement ☐
(e) Others(Specify) .....

42. Has the conflict been resulting into serious clathes?

(a) Yes ☐ (b) No ☐

43. How have you been resolving the ensuing conflicts?

(a) Between yourselves ☐

(b) Through your chiefs ☐

(c) Local Govt/State Government officials ☐

(d) Court ☐

(e) Others (Specify) .....

44. Can you suggest how these problems can be resolved permanently? .....

.....

G. Attitude To Settlement:

45. Have you ever thought of taking to settled life?

(a) Yes ☐ (b) No ☐

46. Give reasons for saying yes or No: .....

47. Have you heard about government intention on making efforts to encourage settlement of Pastoral Fulani?

(a) Yes ☐ (b) No ☐

48. Do you think is a good idea? (a) Yes ☐
(b) No ☐

If no, give reasons: .....

.....

.....

49. Do you think Upper Benue (Hukuma Nadde Benue) can contribute towards settlement of pastoral Fulani? (a) Yes ☐ (b) No ☐

If Yes, in what ways: .....

.....

.....

If No, give reasons: .....

.....

.....

50. Other than Upper Benue who again do you think can contribute towards the settlement programme?

(a) All of you ☐

(b) Opinion leaders among you ☐

(c) Representatives of state and local Govt. ☐

(d) Others (Specify): .....

51. Can you specifically tell me the type of contribution you can make towards your settlement?

.....

.....

52. Which of the following settlement programmes you think can suit the Pastoral Fulani best?

(a) Voluntary ☐ (b) Government Reserves ☐ (c) Ownership of land for grazing only ☐

(d) Others (Specify) .....

53. Why do you think that could be the best programme?

.....

.....

.....

54. What in your opinion must first be done to you before, any settlement programme could be meaningful:

.....

.....

H. Problems And Suggestions:

55. With the establishment of Upper Benue (Hukuma Nadde Benue) which of the following problems recorded sharp increase?

(a) Access to grazing land ▱

(b) Access to Water ▱

(c) Animal Diseases ▱

(d) Conflict with farmers ▱

(e) Others (Specify) .....

56. Which among the following resulted due to the above problems?

(a) Lower Cattle Fertility ▱

(b) Higher Cattle Mortality ▱

(c) Migrate more often ▱

(d) Lesser Dairy Products ▱

(e) Others (Specify) .....

I. Incidence of Diseases:

57. Have you observed some new type of diseases which were not in existence before the advent of Upper Benue? (a) Yes ▱ (b) No ▱

If yes, can you name some of them: .....

.....

.....

58. What in your opinion is the cause of the new diseases? .....

.....

.....

59. Can you suggest how these problems can be tackle effectively? .....

.....

.....

.....

.....

Thank you.

Research Questionnaire(II)

Topic: River Basin Development Strategies And The Integration of Pastoral Fulani: A Case Study Of Upper Benue River Basin

Farmers' Interview Schedule

Project Area: .....

Local Government Area: .....

Instruction:

Responses should be indicated by ticking the appropriate boxes provided. Written information should be recorded in the spaces provided. Additional information can however, be recorded on the attached blank sheets, please.

A. General BackGround:

1. Sex (a) Male ☐ (b) Female ☐
2. Can you estimate your age: .....
3. Marital Status: (a) Married ☐ (b) Single ☐
   (c) Divorced ☐ (d) Widower ☐
4. How many wives have you? .....
5. How many children have you alive? .....
6. Do you have other people living with you? (a) Yes ☐ (b) No ☐
   If yes, how many of them? .....
7. What is your Ethnic group ? .....
8. Which of the below educational levels have you attained?
   (a) Quranic education ☐
   (b) Attended Adult education ☐

(c) Primary but not completed ▱

(d) Completed Primary School ▱

(e) Post Primary but not completed ▱

(f) Completed Post Primary School ▱

(g) None at all ▱

B. Farmers' Activities in The Project Area:

9. Are you a beneficiary of Upper Benue's activities in this project? (a) Yes ▱ (b) No ▱

If yes how?

.....

.....

.....

If No how do you manage to be here? .....

.....

.....

.....

10. For how long have you been cropping under this Project?

(a) 0 - 2 Years ▱ (b) 3 - 5 Years ▱

(c) 6 - 8 Years ▱ (e) Over 8Years ▱

11. How large is your plot?

(a) Less than 0.5 ha ▱

(b) 0.6 - 1 ha ▱

(c) 1.1 - 1.5 ha ▱

(d) 1.6 - 2 ha ▱

(e) If more than 2 ha, specify: .....

12. Have you got other farms outside this project?

(a) Yes ☐ (b) No ☐

If Yes where and how large? .....

13. What are your cultural values regarding land matters

.....

.....

.....

14. Would you want to acquire more land for cultivation?

(a) Yes ☐ (b) No ☐

C. Relationship With Pastoral Fulani

15. Have you lived with Pastoral Fulani within the same environment even before the establishment of this project? (a) Yes ☐ (b) No ☐

If Yes what was the relationship then?

(a) No conflict ☐ (b) Minor Conflict ☐

(c) Serious and always in conflict ☐

What are the main causes of the conflict, list them

1: .....

2. .....

3. .....

4. .....

16. How have you been resolving conflicts between you and the pastoral Fulani?

(a) Intervention of elders ☐

(b) Through local chiefs ☐

(c) Through State/Local Government ☐

(d) Court ☐

(e) Others Specify: .....

17. Were the Pastoral Fulani deriving any benefit from your farms? (a) Yes ☐ (b) No ☐

If Yes, can you indicate some of the benefits?

.....

.....

.....

18. Have you been charging them for the benefits?

(a) Yes ☐ (b) No ☐

If Yes Why? .....

.....

.....

If No Why? .....

.....

.....

19. What benefits have you been deriving from the Pastoral Fulani? .....

.....

.....

20. What other important relationships can you recall existed between you and the Pastoral Fulani?

.....

.....

.....

21. Do you feel with fertilizer you no longer need animal manure for your farm? (a) Yes ☐

(b) No ☐

22. Has the project been settling conflict between you and the Pastoral Fulani? (a) Yes ☐ (b) No ☐

If Yes how? .....

.....

.....

23. Do you think the establishment of these projects have contributed in increasing your relationship between farmers and Pastoral Fulani? (a) Yes ☐

(b) No ☐

Give reasons for saying Yes or No

.....

.....

.....

24. Do you think that by these projects, the Pastoral Fulani have lesser grazing areas and places where their cattle take water? (a) Yes ☐

(b) No ☐

State your reasons: .....

.....

.....

25. Can you suggest how best you think the conflicts between you and Pastoral Fulani can be resolved permanently within this project?

.....

.....

.....

D. Farmers' Opinion On Settlement Of Pastoral Fulani

26. Have you heard of government intention wanting to settle pastoral Fulani? (a) Yes ☐ (b) No ☐

If Yes, What do you think about that?

.....

.....

.....

27. What do you think about the Pastoralists taking to farming other than rearing cattle and other animals?

.....

.....

.....

28. How do you like the idea of also rearing animals along with crop cultivation? .....

.....

.....

29. Which of the following do you prefer as regards to methods of settling Pastoral Fulani ?

(a) The Project to isolate them with their animals ☐

(b) Allocate Plots to them for farming near your plots but isolate their cattle ☐

(c) The project integrates you with the Pastoral Fulani together with their animals (cattle) in the same area ☐

(e) Others Specify? .....

30. In your own opinion, who among the following groups should participate in the settlement programme of the pastoral Fulani?

(a) Opinion leaders among farmers and pastoral Fulani ☐

(b) Representatives of Upper Benue ☐

(c) State Government ☐

(d) Local Government ☐

(e) Representatives of Farmers ☐

(f) pastoral Fulani ☐

31. Is there anything that you consider very necessary that Upper Benue (Hukuma Raya-Kogin Benue) should undertake before, settlement programme of pastoral Fulani becomes meaningful?

(a) Yes ☐ (b) No ☐

If Yes can you briefly tell me?

.....

.....

.....

.....

Thank you.