Dissertation

By

DOGO, Bala

UNIVERSITY Of JOS
JUS. NIGERIA.

The migration patterns of the nomadic cattle fulani of the Jos Plateau-Nigeria

1990.

THE MIGRATION PATTERNS OF THE NOMADIC CATTLE FULANI ON THE JOS PLATEAU-NIGERIA.

BY

BALA DOGO B. SC. (HONS) JOS.

A PROJECT REPORT SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF SCIENCE (M.SC)

IN

ENVIRONMENTAL AND RESOURCES PLANNING

OF THE

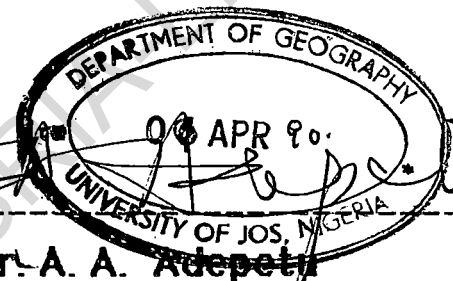
DEPARTMENT OF GEOGRAPHY AND PLANNING
FACULTY OF ENVIRONMENTAL SCIENCES
UNIVERSITY OF JOS

JOS, NIGERIA.

1990.

CERTIFICATION

I Certify that this reseach project was conducted by Mr. Bala Dogo in the Department of Geography and Planning, Faculty of Environmental Sciences, University of Jos, Jos, Nigeria, under my Supervision.



Dr. A. A. Adepetu
senior Lecturer
(supervisor).

Date:
9th April, 1990

Acknowledgement

This project came as a result of many helping hands. Notable among these are: my supervisor, Dr. A.A. Adepetu, for his comments, Corrections and suggestions. I wish to extend my profound gratitude to Pro. H.I. Ajaegbu, who went through the literature review and gave the project a sharper Focus. I should also like to thank Associate Prof. C. Ezeomah - a specialist in the education of nomads - who allowed me access to useful information. I also want to thank my entire family, friends and field assistants who gave me all the necessary support for this Project. Need full for me to point out too is that this project is a success because of the research grants award I received from council for the Development Of Economic And Social Research In Africa (CODESRIA), Dakar, Senegal. Most importantly I should like to express my profound joy and gratitude to the Almighty God who has been and will ever be my strength and Shield.

JOS, 1989.

Bala Dogo.

DEDICATION

DEDICATED TO ALL THE AFFLICTED AND THE BARE - FOOTED FARMERS

A PASTORAL NOMAD'S CREED

I believe in the agro-pastoral sector -
The major supplier of dairy products and proteins in Nigeria -
Particularly, the nomadic pastoralism type of wandering about -
Searching for water and lush pasture for my herds -
Which are my all in all, the life-wire of my being -
The natural endowment of wealth from Allah,
The merciful and benevolent -
Which were handed over to me from generation uncounted.

I believe in the leading of the rest-less-spirit -
That triggers and drives me along, from place to place,
season to season, in search of grazing resources
For my livestock, which are my only liabilities and assets;
Despite ravages done by cattle diseases and epidemics;
Inspire of ill- thoughout government policies and negligence
And to top it all, my cultural horizon,

I have continued to play an important role in providing cheese (nono) and meat.
But my mode of life which is due to the necessary evils surrounding me Has placed me at a disadvantage in the current stream of modernization and rural development
So much so that I cannot attend the regular school system.

I nevertheless pledge my loyalty to pastoralism in general
A lively economy on the Jos Plateau, the dairy district of Nigeria, I pledge to the nomadic way of life because it makes me a special person, With an opportunistic type of living, of staying here today but gone tomorrow -
That notorious lifestyle that has constituted a major problem,
From the environmental, social, managerial and planning point of view A life style that has made me a misfit in the national psyche, I however pledge my solidarity to agriculture, my mother occupation, which has been and will ever remain, the bed-rock
And source of energy for all and sundry,
So, help me God.

Bala Dogo,

Jos, 1988.

TABLE OF CONTENTS

CHAPTER FOUR: THE MIGRATION PATTERNS OF THE NOMADIC FULANI IN JOS AND BASSA L.G.As.

CHAPTER FIVE: THE FACTORS OF MIGRATION

CHAPTER SIX: SUMMARY AND CONCLUSION

LIST OF TABLES

LIST OF FIGURES

LIST OF PLATES

ABSTRACT

Cattle husbandry occupies a pride of place in the agricultural sector of Nigeria. The nomadic Fulani dominate the livestock economy of the country for they not only own but they also rear the bulk of her cattle. The need to cater for the well-being of their animals has kept them constantly on the move from season to season, and from one place to another in search of pastures and water for their herds - the live-wire of their economy. This constant movement has thus constituted some social, environmental, managerial and planning problems. Their constant movement has thus constituted a serious problem that is making it rather difficult to integrate the nomads into the current streams of rural development and the national life.

This study has set out to generate and provide reliable base data on the social, economic and demographic characteristics of the nomadic Fulani in Jos and Bassa L.G.As., which may serve as valuable inputs into planning efforts. The study also sought to identify, describe and analyse the migration factors and patterns of the nomadic (cattle) pastoralist in the study area.

A well-structured questionnaire was the main instrument for data collection. This was supplemented with data from secondary sources such as existing works and maps. A skilful methodology with the participant's observation in the field was employed.

On the basis of 360 respondents, the study found out that: the sizes of the households of about two-thirds of the respondents are small with households ranging from 2 - 5 members in size; that an average nomadic Fulani man is richer than most average Nigerians, except that he appears haggard; that over 60 percent are illiterates. That their migratory tendency is fixed except in cases of emergencies-such as out break of diseases - where the decision to move away could be taken overnight.

The study also found that the Fulani nomads in Jos and Bassa L.G.As. have five major migration routes which tend to follow the edges of the Jos Plateau to the adjoining plains, that there is a significant variation in the direction of movement, within-and between- the wet and dry season; and that all the factors of migration do not play equal roles in motivating movements.

The study not only demarcated the major outlets and/or inlets of the nomadic pastoralist in the study area but also showed the intra-and-inter-state movements involved. The attendant problems involved in migration of the nomads were also discussed.

The study ends by suggesting that future studies should focus attention on measuring the rates and volumes of migration of the nomadic Fulani; and on isolating the few 'push' and 'pull' factors of migration not only in the study area but also elsewhere.

CHAPTER ONE

THE INTRODUCTION

1.1 Background to the Study

The Nomadic (cattle) Fulani dominate the livestock economy of Nigeria, for they not only own but they also rear the bulk of her cattle. Emovon (1988) noted that the centrality of the pastoralist in Nigeria's economy can be seen from her numerical domination of the country's livestock industry. The livestock sub-sector contributes about 40 percent of the national income derived from agricultural production and provides about 78 percent of the meat consumed annually. It is on record that the nomadic Fulani own over 80 percent of national ruminant livestock and supply, annually, about 85 percent of beef and over 70 percent of mutton and goat meat for national consumption. It is important to note that the cattle Fulani who are estimated to be around 5.3 million in Nigeria and own over 12 million herds of cattle; out of which 1 million are slaughtered annually for local consumption (Ezeomah, 1988) make a significant contribution in the production and management of the agro-pastoral sub-system of Nigeria.

Inspite of the important contribution of the nomadic Fulani to the agro-pastoral sector, the failure to adequately cater for the welfare of their livestock- which is the live-wire of their economy has perpetually kept them as opportunists who are literally "here today and gone tomorrow" in search of water and pasture. The constant and seasonal movements of the nomads thus constitutes a major problem from the managerial, environmental and planning points of view. For instance, the itinerant nature of the nomads and their dispersion in isolated rural areas has made it rather difficult to reach them with basic veterinary and social amenities and education. The constant movement, too, has been associated with the spread of certain epizootic diseases and the outbreak of some animal epidemics (Sunday Standard, Feb. 28th, 1988). Their migratory nature has made it rather difficult to harness and plan for the agro-pastoral resources maximally and profitably too.

Thus, the problem of making the nomadic Fulani contribute more effectively to the economy of Nigeria has been a major concern to economic planners and policy-makers because of their "wandering" nature which has left these nomads as marginal men that are difficult to integrate into the national life. Their mobile nature has also made the

Cattle Fulani not to benefit fully from the current streams of rural development programmes in Nigeria.

It suffices to say that the major problem of the nomadic Fulani seems to revolve around their migratory practices. In fact, Onazi (1988) rightly pointed out that the nomadic way of life of the Cattle Fulani is one of the greatest challenges and problems in Nigeria today. The need, therefore, to remove this obstacle and carry out an indepth study of the migration patterns and/or processes of the nomadic Fulani in Nigeria is very tremendous and timely too.

PLATE 1 The Nomadic Way of Life has become a national problem from the environmental, social and managerial point of view.

The never-ending search for pasture and water has kept the nomadic Fulani on the move from season to season with children in the front and women at the rear.

The cows are used for conveying bags and luggage during movements

---

Source: Nomadic Education Research Unit, University of Jos, Jos Nigeria.

1.2. The Study Problem

This study will address itself to this fundamental question: What is the migration pattern of the nomadic (cattle) Fulani in Jos and Bassa Local Government Areas? This broad question has the following aspects which the study will attempt to investigate. How does the migration patterns of the nomadic Fulani in the study area constitute a problem? How is this pattern influenced by the presence of grazing resources in the area? What does the migration pattern of the pastoralist in the study area look like in the wet and dry seasons? What are the major motivating factors of migration of the nomads? are there possibilities that apart from the search for pasture and water for cows, there are other causes of migration? What are the 'Push' and 'Pull' factors of migration in this case? Could it be that the 'Push' and 'Pull' factors play equal role in determining the pattern of migration? What are the major obstacles to migration of the nomads? Presently, where are the major cattle outlets and/or inlets in jos and Bassa L.G.A's? What is likely to be their trends of movement in the future?

1.3 Aims, Objectives and Major Issues of the Study

The study sets out to achieve the following objectives:

1. To generate and provide reliable data on the social, economic and demographic characteristics of the nomadic (cattle) Fulani in Jos and Bass Local Government Areas.

2. To identify, describe and analyze the migration patterns of the nomadic Fulani in Jos and Bassa L.G.A's; investigate migration factors, and account for the patterns and factors so established.

3. To predict the likely patterns of migration of the nomadic Fulani in Jos and Bassa L.G.As in the future.

It is hoped that the findings of this research will not only reduce the present paucity of reliable data and knowledge on the migration pattern of the nomads in the study area, but will also help us in our planning strategies like the provision of social amenities such as citing of mobile

schools; grazing reserves, veterinary clinic; and posts for census of cattle and inoculation points of livestock; integration arrangement programmes for the nomads and the eradication of livestock epidemics.

1.4 Theory building: The Magnetic Flux Pattern

In this study, we intend to use the basic principles of a bar magnet and its magnetic flux patterns to theorise on, and explain the migration patterns of the nomadic Fulani in Jos and Bassa Local Government Areas.

When a bar magnet is freely suspended, it oscillates and finally rests in a north-south direction. A magnetic line of force is created which forms a definite pattern radiating from North to the South Pole. These lines are called magnetic flux; and they are vector quantities since they have both magnitude and direction (Abbott, 1978). Some of the basic rules of bar magnets include the following: the North Pole of the magnet faces the South Pole of the terrestrial globe and vice-versa. (Some persons also refer to the two poles of a bar magnet as consisting of the positive and negative poles). Also, like poles repel each other, while opposite poles attract.

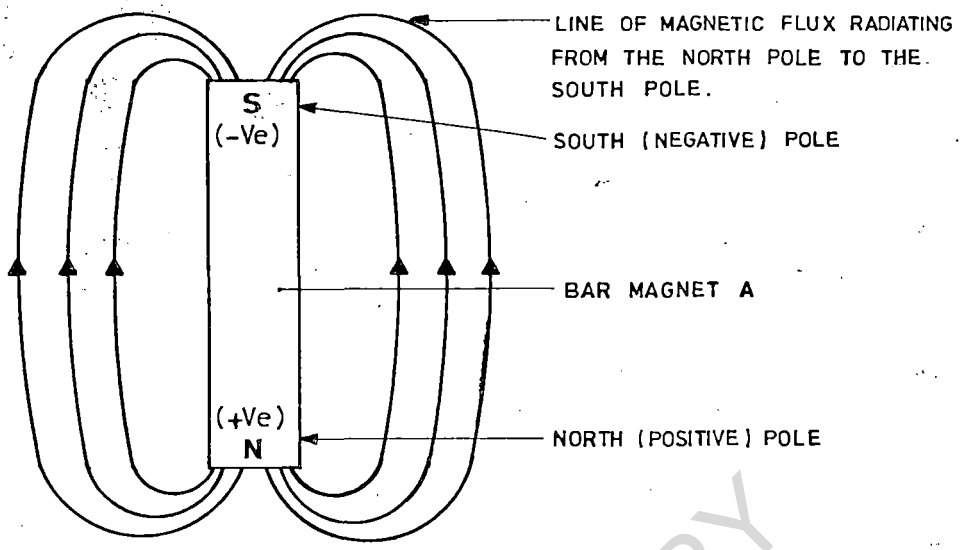
Conceptually, we can say that generally, the pattern of a magnetic flux of any given bar magnet (A) is a function of many factors. These include the area of the bar magnet-which determines the sphere of influence of the magnetic field; the strength of this magnet which determines the spacing of the magnetic flux lines whose intensity decreases with the distance from the source region; the presence and/or absence of another bar magnet (B) - which can induce deflect, reform or completely change the original magnetic flux pattern of magnet A.

We can mathematically express the above statements thus:

$$MFP(A) = f(A, S, X_B, \ldots\ldots\ldots\ldots O).$$

Where MFP(A) is the magnetic flux pattern of bar magnet A

- A is the area (length X breath) of the bar magnet
- S is the strength of the magnet
- X_B denotes the presence and/or absence of another magnet (X) or/and ferromagnetic substance.
- O stands for other explained and unexplained variables.



ADAPTED AFTER ABBOT, 1978.

Fig. 1.4.1 An illustration of the magnetic pattern of a bar magnet.

We can liken the above analogy to the migration patterns of the nomadic Fulani in our study area thus: That a definite pattern of movement exists among the Fulani pastoralist. This pattern is a function of many factors- those that pertain to the well-being of the cows which are further predicated by environmental and climatic factors; and man, who does the rearing of the cattle. We can also apply the concept of 'Push' and 'Pull' or 'negative' and 'positive' force of migration (Lee, 1966) in our own case here to represent prevailing favorable and/or unfavorable factors that direct the North-South movement of the cattle Fulani during the dry season, when grazing resources are scarce in the North; and the reversed South-North wards movement when the rains have arrived - which also follows the advent of tse-tse flies. This general pattern is further influenced by other factors. For example, the hydro-geology and relief of the area. For instance, escarpment and the high rugged relief areas are usually circumvented. (See Fig. 4.4.1). The presence of the Kagoro hills is the probable explanation for the pattern of migration of the nomads seen around that area. Further, field investigations have shown that the nomads tend to follow only the edges of the plateau. Thus, the physiography of any region can serve as an obstacle to migration. The sudden outbreak of cattle diseases can literally scatter or modify the pattern of migration of the nomads.

Similarly, the presence of large concentration of settlements are avoided. Only bush paths serve as migratory routes. Most importantly, the presence of lush pasture and water in any area also contributes to the explanation of the migration of the pastoralist. It is also important to note that the positioning of our poles are reversed at the onset of the seasons.

In this study, we shall try to find the patterns of migration of the nomadic Fulani in the study area and the factors which govern these patterns.

1.5 Assumptions of the Study and Working Hypotheses

A number of assumptions are considered for this study.

1. That traditional animal husbandry is the live-wire economy of the nomadic Fulani; and cattle are considered as priceless possessions (Hopen, 1958). Therefore the need to keep the cattle alive makes the pastoralist move from place to place, season to season, searching for pasture and water. Implicitly, the needs of the cattle, per se, are the major factors determining the patterns of migration and not necessarily the seasons.
2. That apart from the needs of the cattle which determine the nature of migration of the pastoralist, the nomadic Fulani, are rational beings who systematically utilize their immediate circumstances in a reasonable way to arrive at a behaviour decision of rationally optimising the cost and benefits of their decision to migrate (Fishbern, 1975; 1980; Todaro, 1976; and Raveinstein, 1889). Invariably, we can argue that although the cows dictate the typology of migration, the nomads have the over-riding and free-will to decide where, when and how to move.

Based on the above assumptions, the following null hypotheses are postulated for this study.

1. That there is no significant variation between the movement patterns of the nomadic Fulani in Jos and Bassa L.G.As. between and within the wet and dry seasons.

2. That all the factors which govern the patterns of migration of the nomadic Fulani (in Jos and Bassa L.G.As) play equal roles.

1.6. The Study Area

Generally, the Jos Plateau has a unique climatic and physiographic condition which suits pastoral activities. The abundant supply of water, especially from the many rivers which drain the area and the many mine pits and the absence of tse-tse fly make the rearing of livestock in the area economically feasible.

For vigorous and detail investigation, the (focal) study area for this research in Jos and Bassa L.G.As of Plateau State (Fig. 1.6.1) The two Local Government Areas form part of the tin mining area of the Jos Plateau (Fig. 1.6.2) which is estimated to cover an area of 8,600 km². The Jos Plateau is a pear shaped highland that stands above the surrounding plains of Kaduna, Bauchi and Benue.

Jos and Bassa L.G.As are located towards the northern end of the Jos Plateau and have an estimated area of 200 km². Like other parts of the tin mining region of the Jos Plateau, Jos and Bassa L.G.As have an average height of about 1219 metres (4,000 ft.) above sea level. The area has been a scene of repeated plutonic activities of metamorphic rocks of mixed sedimentary and igneous origin. (Fig. 1.6.4). The soils are thin and deficient in phosphorous, potash and calcium.

The area experiences a cool temperature, mean annual temperature being 27 and an average rainfall of 1524 mm (60 inches). The climatic type belongs to the AW category of Koppen's classification of climate. The vegetation is basically the Savanna type (Fig. 1.6.3).

The pre-dominant economic activity in the area include farming. Crops cultivated include acha, millet, maize, Irish potatoes, guinea corn and vegetables. Zaki (1985) noted that a large number of pastoralist are found in the study area which is considered as suitable for grazing activities by the herders.

The area is well-drained, has enough grazing water resource for livestock production and the area is tsetse free (Mortimore, 1978). In fact, due to the suitability of the region for grazing activities, Adepetu (1986) noted that some 40,000 to 60,000 cattle now graze permanently on the Jos Plateau.

This study will therefore focus attention on Jos and Bassa L.G.As due to the relevant socio-cultural characteristics and the environmental attributes that are vital for the livestock industry.

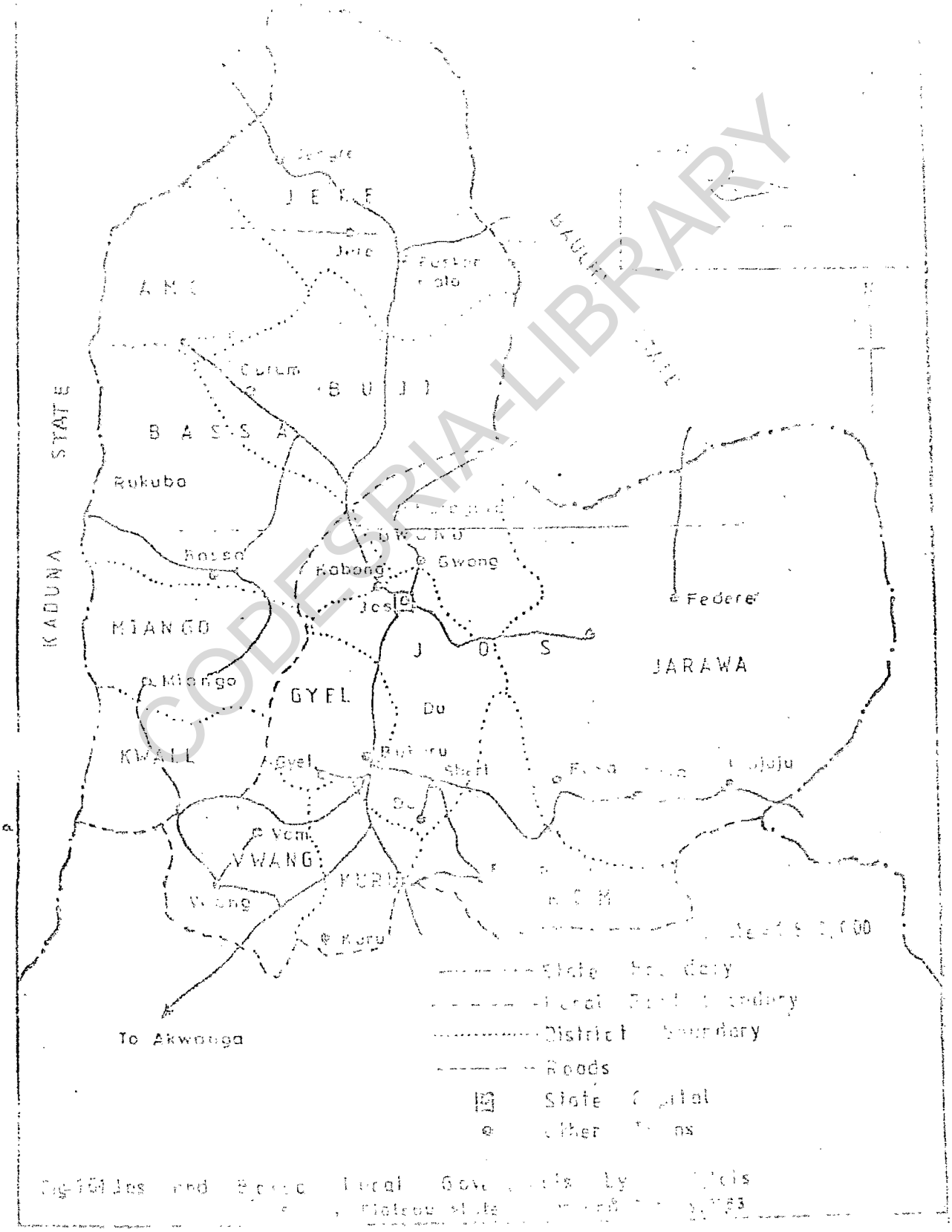


Fig 1-6-2. The mining region of the Jos Plateau

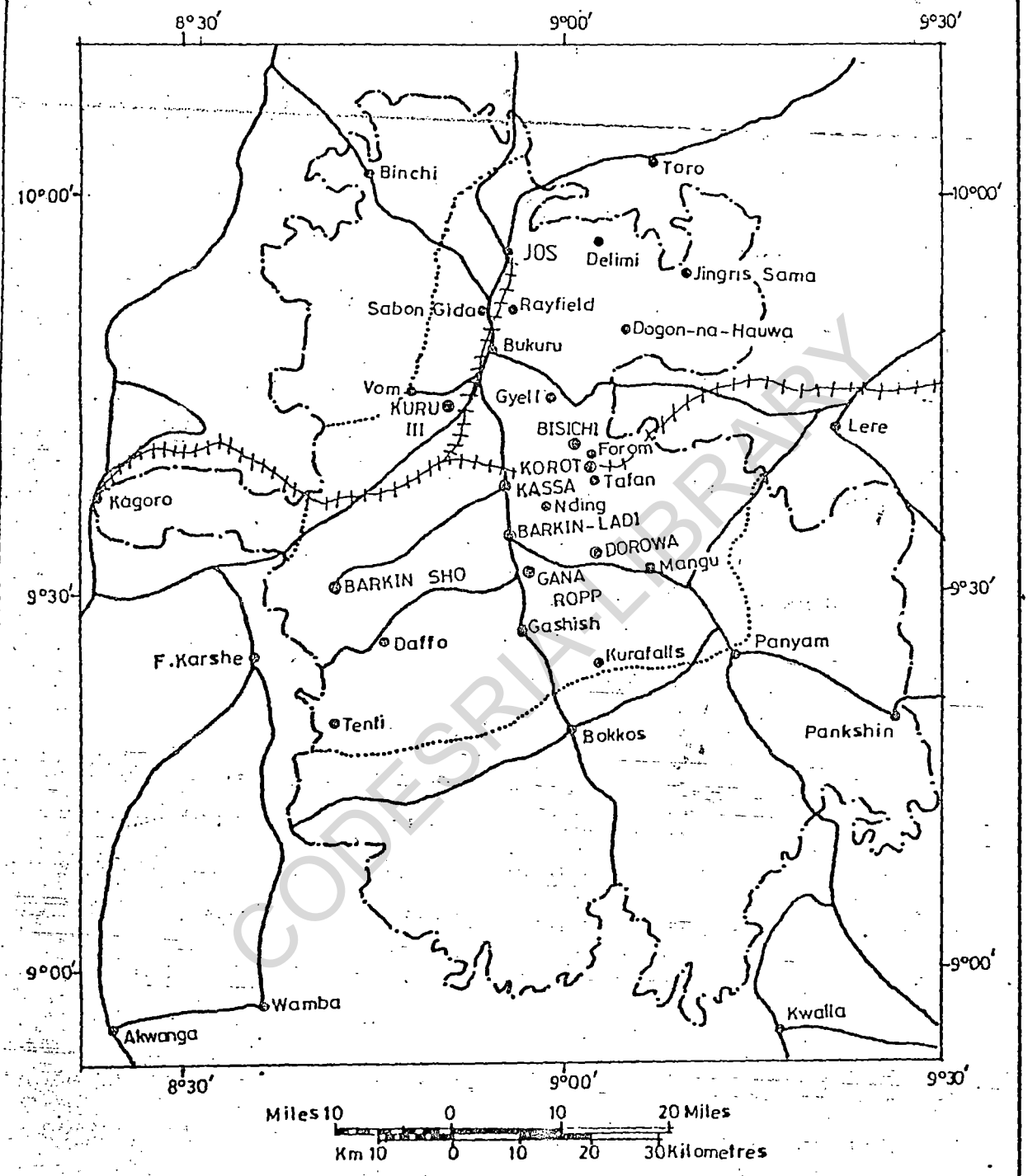
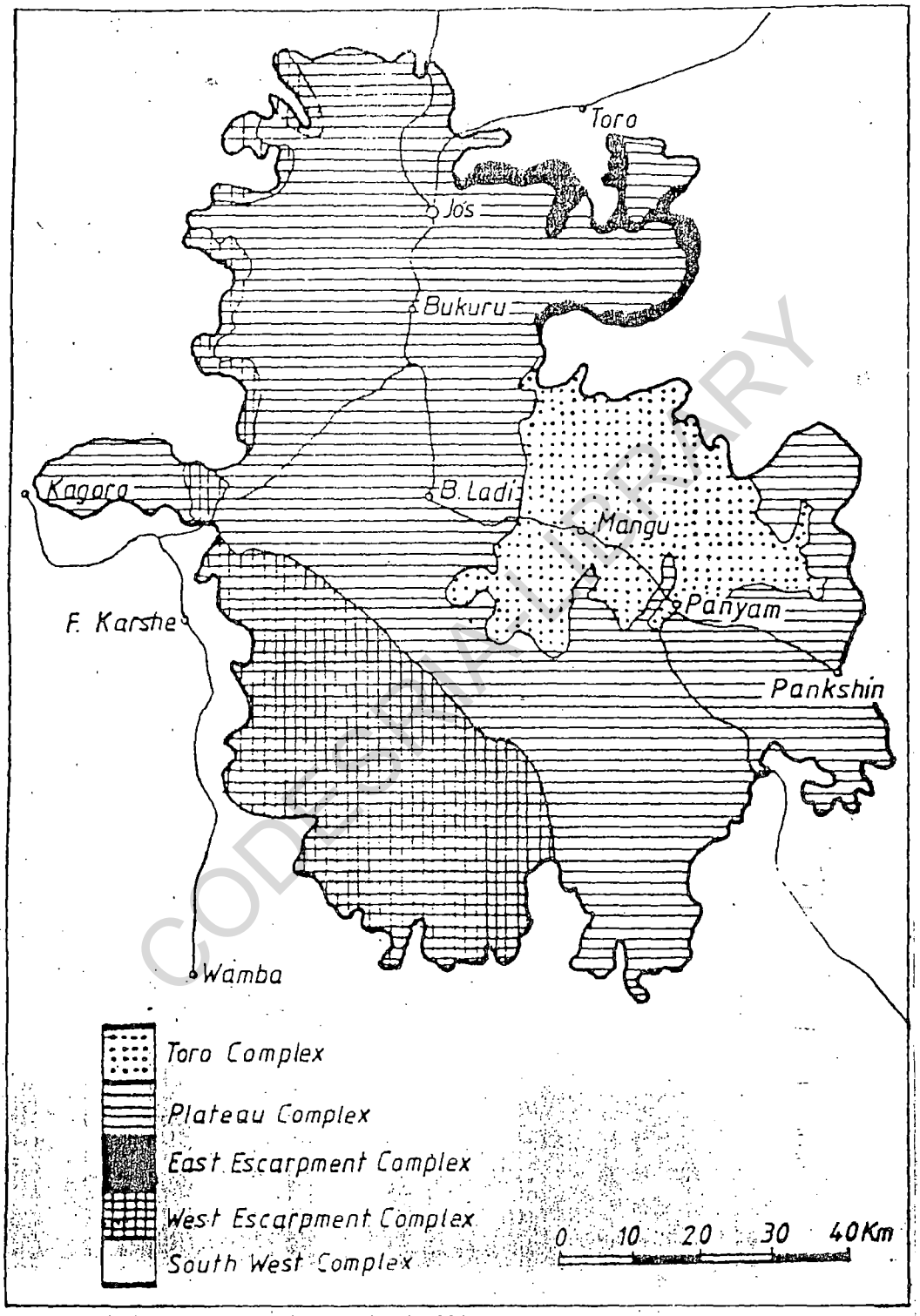


Fig. 1.6.3 Vegetation of Jos Plateau



ADAPTED AFTER AJAEGBU (Ed.) 1986

figure 1.6.4: THE JOS PLATEAU-PHYSIOGRAPHY

source: HILL and RACKHAM (1974)

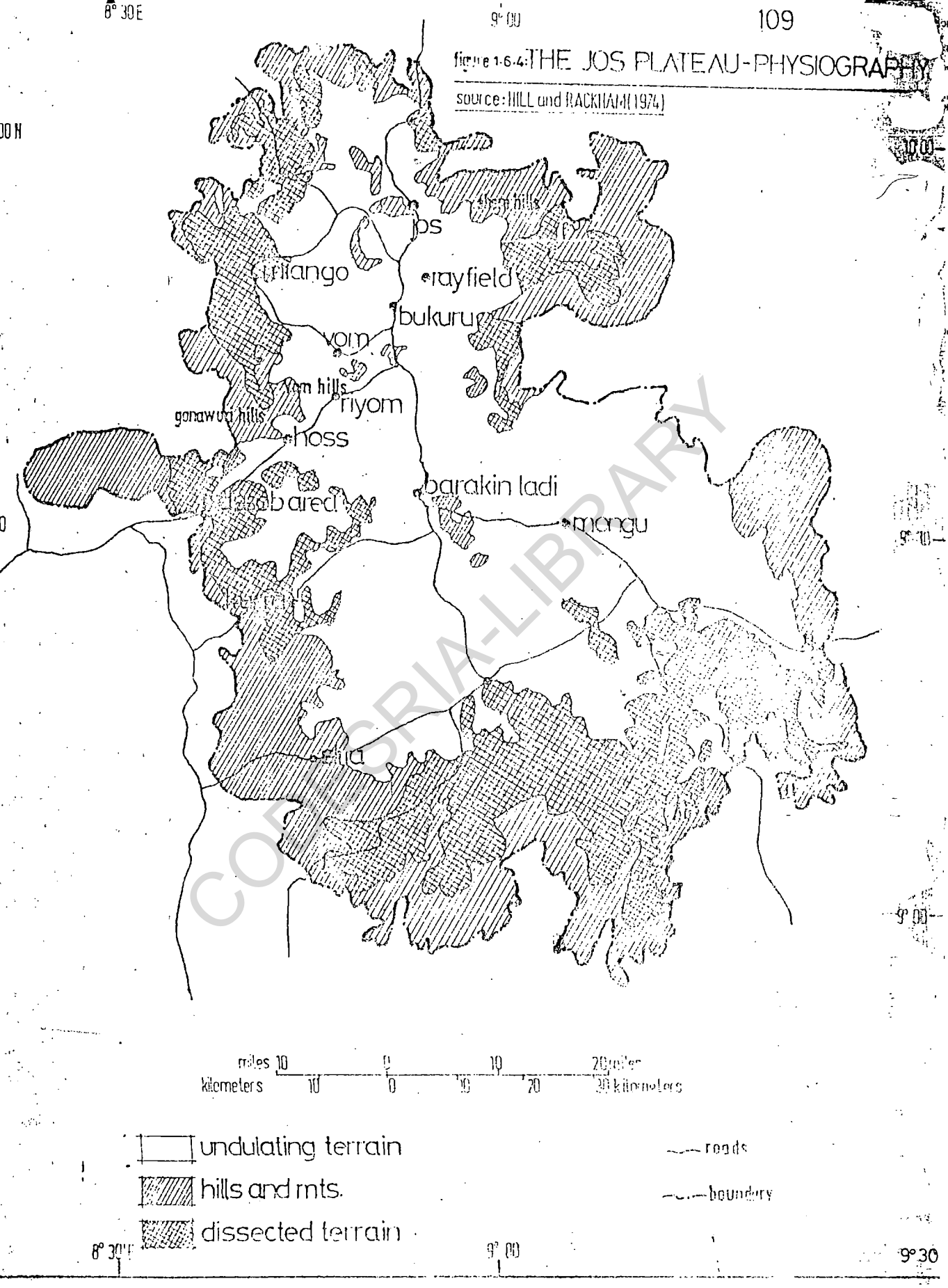


PLATE 2 A Typical nomadic Fulani camp (Ruga) On the Jos Plateau.

Source: Nomadic Education Unit. University of Jos,1988.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter focuses attention on the review of relevant texts and earlier migration studies - the conceptual models and theories employed, methodological issues and findings of previous researches in this field. Special emphasis is however placed on rural migration works, most especially as it applies to the nomadic peoples of the world, and particularly the nomadic Fulani of Nigeria.

The chapter is divided into five sections. The first part takes a critical look at classical migration studies and theories from a global point of view, then focuses specifically on rural migration studies in Nigeria. The second part deals with the migration-decision processes. The third part describes the migration patterns of other nomadic tribes in other parts of the world. The fourth part examines the methodologies used thus far in conducting migration studies in Nigeria - their findings and short-comings. The last section, finally, identifies the gap in knowledge which the study wants to fill and contribute to existing knowledge.

2.2. Classical/General works on Migration

Literature abound on migration studies. The ones which readily come to mind include those of Raveinstein (1889), Stouffer (1940), Zipf (1946), Bogue (1959); Olsson (1969), Lee (1966). Taylor (1969); Galletti *et al* (1956) and Udoh (1975). In general, the causes, consequences, volume and direction of migration have long pre-occupied the attention of students of migration studies.

Udoh (1975) observes that migration involves a permanent or semi-permanent change of residence and has been defined as man's reaction to economic differentials, though, most research workers have since recognised that factors which are non-economic are also important in inducing migration.

Raveinstein (1889) however points out that migratory flow could be looked upon as a system which has some sort of order, which obeys some economic laws which need not be as rigid as physical laws but which, nevertheless, are consistent and do provide a basis for the formulation of predictive and explanatory theories.

The general consensus among scholars is that the migration laws of Raveinstein have merely been modified and not disproved fundamentally by subsequent researches.

Geographers, for example, have paid particular attention to the relationship between migration and distance. Most studies show migration to be inversely related to distance. Hagerstrand and others have used regression techniques to describe this relationship - which is the basis of mean information field concept. Zipf (1940) showed, in his basic formulation of the gravity model, the relationship between population size and distance of migration. This is summed up in what is generally called the Inverse Distance Law which states that:

> The volume of migration is inversely proportional to distance travelled by the migrants.

This can be mathematically expressed by the formula

$$NIJ = D_{IJ}^{-1}$$

in which NIJ is the number of migrants from towns I to J and DIJ is the distance between the two towns.

This theory has however been challenged because it does not hold in certain situations.

A different version of the theory above is the one made by Stouffer (1940). This theory is known as the theory of intervening opportunity which not only looks at size of settlements and the distances between them but at perceived opportunity between them. According to this theory, the amount of migration over a given distance is directly proportional to the number of opportunities at the point of destination, but inversely proportional the number of opportunities between the point of departure and destination.

More recently, Bogue (1959) provided a comprehensive list of determinants of migration:

1. Migration stimulating situations for individual migrants; for example marriage, employment opportunities, political oppression and the need to look for freedom and graduation from school.

2. Factors affecting the choice of destination. For example, cost of transportation and the presence of relatives and friends.

3. Socio-economic conditions that underlie individual migration decision, for example, the quality of housing in an area, the ethnic or racial tolerance and economic investment in the area, especially those that can generate job opportunities.

In a similar way, Lee (1969) identifies four major determinants of migration: Factors in the areas of origin, Factors in the area of destination, Personal factors and Intervening obstacles or opportunities.

From a statistical point of view, two major approaches have been used in the study of migration distance. The first approach which considers migration distance as a dependent variable is more suitable for a study such as this. Using the general multiple regression model

$$Y = a + b_1 X_1 + b_2 X_2 + \ldots + b_n Xn$$

Where Y denotes migration distance, and X_1 X_2 ..., X_n represent independent variables such as size of population at the source region and destination, level of income at the source region and the destination, age of migrants, etc. This method seeks to establish some correlation between migration distance and the various variables. The merit of this approach is that it tries to quantify some of the theoretical relationship earlier discussed (Udoh, 1975).

The first successful attempt to study variation in migration distance using this approach was made by Olsson (1965). Using data drawn from the population sample register of the Swedish Central Bureau of Statistics. Among other things, Olsson proved that a positive significant statistical relationship exists between migration distance on the hand and, on the other hand (a) the level of income in both the place of origin and the destination. (b) the degree of unemployment in both the place of origin and the destination. (c) the size of population of both the source region and the destination.

The age of the migrant was shown to be negatively correlated with the migration distance while the income of the migrant's family showed a positive correlation with migration distance.

Very impressive as the technique might appear to look like, the observation of Udoh (1975) is worthy of noting. "Unfortunately, apart from physical distance between places, the data which has been used in many rural-rural migration studies are not reliable enough to warrant this method of analysis".

The second major approach used in the study of migration distance is the one in which migration distance is treated as the independent variable to account for variations in migration intensity. This approach studies migration streams between different sizes of settlements, making use of gravity models (which is beyond focus of this study). Moreso, it is best suited for the study of urban-urban and rural

migrations, and will not be considered in this study of migration of nomadic Fulani which is basically a rural-rural migration.

Onokerhoraye (1985) conclusively observe that over the years, Raveinsteins laws of migration have been modified by other scholars to reflect changing techniques and varying circumstances as we have seen above. Nevertheless, he pointed out that the most of these studies have confirmed rather than disproved Raveinsteins postulates.

2.3. The Migration-Decision-Process/Factors

It is important to see sections 2.2 and 2.3 as not necessarily mutually exclusive. however, in summary, we have briefly described some of the "laws", theories and models of migration. The focus is on those laws, theories and models which address two major areas: the decision-making process and the streams and volume of migration. The earliest of those laws - Raveinstein's is a logical starting point. It is also most comprehensive, as it embraces both aspects relating to the decision process and both the volume and direction of migration.

As earlier noted, among others, Raveinstein made some basic postulates relating migration and distance, migration and stages, the generation of streams and counter streams of migration, the urban-rural differences in the propensity to migrate; migration, technology and communication. It is however very important to point out here, the dominance of economic motives in migration (Raveinstein, 1889; Todaro, 1976).

The migration-distance hypothesis stipulates that migration is inversely related to distance. That major migrations occur over short distance in which case the number of migrants decline with distance. That also migration occurs in stages. We earlier noted that all these laws have been reformed by Lee, Stoufer, Zipf and others.

Specifically, Lee (1966) developed a theoretical framework for analyzing the volume of migration. These include the characteristics and by extension, the factors that affect the decision-making process. He classified the factors which generally prompt migration into "pull" and "Push" factors which are, correspondingly attractive and repulsive forces. The push factors normally include the deteriorating socio-economic conditions in the origin area which literally forces people to move out of such localities. The push factors include the attractions and socio-economic opportunities available in other localities - attractions

which are sufficiently powerful to not only attract people to that location but more important, retain people within it. This model of Lee does not take into account the characteristics of the migrants and the characteristics of origin and destination areas of the migrants which are major elements of the migration process (Adepoju, 1985).

Zipf (1946) using the principle of least effort hypothesized that the number of migrants from one city to another is a function of the distance separating these localities. Thus, incorporating the three actors in the migration scene - the source, the destination and the migrant - in the formation of his hypothesis. Zipf further pointed out that distance as it relates to migration could be interpreted in economic, physical and cultural terms. The economic interpretation would relate distance to the cost of transport, while the social aspect views migration in relation to the social milieu of the environment which either facilitates or hinders the integration and assimilation of migrants at the destination.

Stouffer (1940) theory of intervening opportunities stressed that the volumes of inter-area migration is a function of intervening opportunities, the number of people in each area, and the number of competing migrants. All these-push and pull consideration - can be extended to what Stark (1984) terms the relative deprivation approach. In his view, rural-urban migration should conceptually be analyzed as a response to measurable dissatisfaction with the place of current residence as a means of eliminating or reducing such dissatisfaction. The Lewis-Fei-Ravis Model (1961) divided the economy into two sectors - the rural (subsistence, agricultural) sector and the urban (industrial, modern sector) Mobility of labour-force to grater areas of 'economic opportunities'. In this case, the migrant avails himself/herself of the range of opportunities not easily available in rural areas.

The Okun-Richardson's (1961) model, according to Udoh (1975) is essentially an analysis of the flow of migration, emphasizing the role of regional development in shaping the direction of migration flows. They argued that the effects of internal migration on regional equality of per capital income are conditioned by:

1. The direction of flow of migration;
2. Short and long rain effects;
3. The stage of economic growth of the country.

Their model of regional migration flow assumes a closed economy devoid of international migration. These regions of the country are classified into:

1. Stagnant region with low per capita income (LS)
2. Stagnant region with high per capita income (HS)
3. Growing region with high per capita income (HG)
4. Growing region with low per capita income (LG)

They maintained that migration would logically flow from stagnant to low and high growing areas; and from low growing to high areas.

However, the Okun-Richardson's model has been criticised in that it disregarded migration between regions with similar characteristics. Hence its applicability is constrained to urban-urban or rural (as the case of this study which applies to the nomadic Fulani) migrations (Mabogunje, 1970).

Gulliver (1955) tried to integrate attractiveness of city life to economic factors. This has resulted to what is called: the Bright Light theory in migration-decision. He argues that the attractiveness of the city life is the major determinant that lures the migrants to move. In this case, the decision to migrate is essentially made by the individual rather than the household.

The active role of economists in formulating the decision theories is evidenced in Todaro's model. Todaro (1976) postulated that migration proceeds in response to urban-rural difference is <u>expected rather than actual earnings.</u> This model has been criticised and refined by many authors and Todaro himself.

The human capital investment approach formalised by Sjaastad <u>et al</u> (1962) explains the costs and benefits of migration. It views geographic mobility of workers as a logical response to economic incentives deriving from disequilibrium across spatially separated labour markets.

Econometric models developed by De Vanzo <u>et</u> al (1981) and the recent value-expectation model by De Jong and Fawcett (1983) have their series of models and theoretical frameworks which sought to synthesise the decision-making process at the micro-level. Their model, in essence, involves the specification of personally valued goals which are to be met by moving (for example, this strongly applies to the nomadic Fulani who are opportunists, who cherish their livestock as their lives and the need to keep these animals makes them move from place to place in search of pasture) and the expectation of achieving these goals in alternative

destination. These goals and values include wealth (in fact, the nomadic Fulani count the number of cows as synonymous with wealth status), status, comfort, stimulation, autonomy (it has been argued that the nomadic Fulani love freedom and that is why they move from place to place (Ezeomah, 1987b), affiliation and morality.

Onokerhoraye (1985) observes that whatever the type of migration, the decision to migrate is influenced by variety of factors. Therefore, explaining migration requires an explanation of why some people move from one place to another just as why others do not. In general, attempts to explain migration have generally been from two perspectives. The first category includes much of the early studies of migration which involved Geographers, Sociologists and Anthropologists. They emphasized social, cultural, spatial and psychological factors influencing migration, although they noted the role of economic factors. In recent times, the second group which include economists have shown much interest in explaining migration particularly in the context of rural-urban movement. According to this group of scholars, individuals involved in migration process are viewed as rationally optimising the costs and benefits of their decision to migrate.

Although much emphasis is placed on economic factors, some of them, like (Ajaegbu, 1979; Mabogunje, 1976; Findley, 1979) have included other factors like residual environmental factors at both origin and destination.

Conniel, (1978) observes that who migrates and whence, depends critically on the decision procedures. He said that this largely un-researched issued can be separated into four questions: Who decides, with what motive(s), with what information, how the choice is conceptualised. Whatever be the case, existing surveys on migration indicate that the motives for migration are primarily inter alia, economic. The most consistent generalization about migration is probably the fact that economic considerations or " the desire inherent in most to 'better' themselves in material respects" (Raveinstein's 1889) constitute the single most important reason why people migrate. It is expected however in our own case in this study that the primary factor of migration is socio-economic-cum-environmental.

2.4 Rural Migration Studies in Nigeria

Generally, Udoh (1979, P.1) observes that Rural-Rural migration is a neglected aspect of population movement in Nigeria. He observes that current research and government policy are largely concerned with rural-urban migrations and have tended to give the impression that internal migration in Nigeria is synonymous with rural-urban migration. Time and again, the daily newspapers have requested the government to do something to arrest 'the mass exodus of rural youths to the cities'. In fact, Udoh observes that a survey of contemporary literature on migrations confirms that even in the developed countries, the emphasis has been on rural-urban migration. The consequences of this is that the process of rural-rural migration is neither so well documented nor understood.

Adepoju (1986) gives a compendium of some rural-based studies carried out in recent years. These include Olusanya's survey of selected villages in the former Western Region in 1965/66; Udoh's study of migrant farmers in South Western Nigeria in 1966; Adegbola's survey in Osun Division in 1973-74 and the survey among migrant cocoa farmers in South-West Nigeria by Olususanya and his colleagues in 1970-72; Adepoju's rural survey of Ife Division (1976); Odimuko's rural survey in Imo State, and Makinwa's rural survey in Bendel State in 1981.

Prothero's studies in the early fifties (1952-53) in North-Western Nigeria focus on seasonal migration and by intervening migrants at the origin, precisely the point of departure - (covering about an estimated 250,000 persons at various check-points) examined the motives of migration, characteristics and instance covered by migrants. Prothero showed that the migration was male dominated and was programmed to suit the seasonal vibration in labour demand in various parts of the country (Prothero, 1959, 1976).

Galletti and his colleagues, in their study of the cocoa industry in South-Western Nigeria, examined the environmental and economic conditions under which labour migrants worked. They indicated that cocoa farmers benefited from the migrant labour systems which provided the labour needed in the farm to replace the youths who had earlier migrated to the cities in search of wage employment (Galletti, et al, 1956).

Olusanya's rural migration survey in five villages in the former Western Region covers a sample of 615 households. The field work stage was spread between March and May, 1967. The aim of the study was to examine the environmental and socio-economic conditions that propel city-ward migration

(Olusanya, 1969). The 1970-72 study of tenant migrant farmers in the eastern cocoa zone of South-West Nigeria by Olusanya, et al, focused on the type of land and the operation of the tenant farmer system (Olusanya, et al, 1978). The study of 975 migrant farmers concentrated on the eastern sector of the Western State which includes the largest Cocoa producing areas of Yoruba land (Olusanya, 1976). Both studies underlined the "push" factors in rural exodus, the emergence of absentee landlords and the need to improve the social infrastructures and amenities in the rural areas as a measure to stem rural exodus.

In summary, studies by Udoh (1975), Olusanya et al (1978), indicate that rural-rural migration reflects the ecological differences as well as the diversity in resources and opportunities in the rural sector. They contend that rural-rural migrants contribute to the growth of the economy of the destination areas as tenant farmers, share-croppers of form laborers - unlike the rural-urban migrants as increasing number of whom parasite on the urban economy as unemployed persons. Rural-rural migrants have been known to exploit the resources - cocoa, kola, palm products, rubber and contribute to the diversification of the rural economy.

It is important to pint out here that most of the studies on migrations in Nigeria, hitherto, is concentrated in the south.

2.5. Methodologies and Major Findings of Migration Studies in Nigeria

Adepoju (1980) observes that inspite of the proliferation of migration studies especially here in Nigeria, our understanding of the mechanism of the migration system has not been substantially enhanced. Both definitions and concepts, Adepoju observes, are under standardised; while the methodology used and data presentation remain poor. All these factors hamper rather than facilitate meaningful comparative analysis of migration studies. This sad situation still persists inspite of the deliberations of migration seminar at Ife in 1975. Adepoju pointed out that most of the previous migration studies in Nigeria are not statistically eloquent. In only few cases have hypotheses been formulated and rigorously tested. The reason perhaps is attributed to the fact that few of such studies are based on rigorous sampling techniques. As a result, such studies have not provided the basis for statistically valid inference about the universe of interest. Bearing this in mind, this

study will attempt to bridge this data gap.

Nevertheless, Adepoju (1986) observes that data on migration in Nigeria derives from three broad sources: Government sponsored surveys, sample surveys in institutions and individuals and indirect information from censuses. The study of labour migration in Sokoto Province during 1952/53 and the rural demographic sample surveys during 1965/66 belong to the first category. Mabogunje (1970), McCain (1972), Green (1974), among others have utilised the regression and related statistical analysis. By far, the series of sample surveys conducted over the past fifteen years by several social scientists serve as the primary source of information on migration in Nigeria.

Furthermore, Adepoju (1986, P. 20) pointed out that one major pitfall in the existing migration surveys in Nigeria is methodological, especially sample design. He observes that quite a number of published works on migration in Nigeria do not specify the nature of sample design.

The sample size, including the rationale and produce for the selection of the survey location, choice of households and respondents. Worse still, some authors do not specify the date of the survey. When such information is provided, the sample sizes are usually small. For one thing, one-shot sample surveys are less suited for measuring rates of migration (Conneil, 1978) - Unlike the multi-round surveys because of the sensitivity, seasonality and variability of the migration phenomenon. Conneil observes that migration, like fertility and mortality, is subject to wide variations both temporarily and spatially, hence a large sample size is required to reduce high fluctuations in the observed migration rates, while this appears not a serious problem yet, apart from the rural demographic surveys of 1965-66, no other migration study has addressed itself to establishing the rates of migration in Nigeria.

More so, Conneil (1978) rightly pointed out that migration especially rural migration, is a complex process varying over space and time in its scale, patterns and causes. The village studies, on which we rely here, are mostly static one-shot affairs, yet even the terminology of migration analysis implies a comparative dynamics: Migration is described as chain; step, linked, circular, etc. And the mainstreams of analysis today centre upon the 'Todaro hypothesis' which states that Urban income prospects explain most migration, yet our focus is on its rural causes and effects.

Conneil (1978:216) said that a quick view of the literature on migration in general reveals the following and the need, too, to correct them.

1. The first is the possibility of improvement in the methodology;

2. The 'one-shot' nature of data which makes it impossible to measure rates, more so, it is very difficult to separate cause from effect in one study.

3. The need to incorporate vigorously statistical techniques using multi-variate analysis involving simultaneous equations giving timed relationship between variables.

2.6. Migration Patterns and Factors of the Nomadic Fulani of Nigeria and Some Nomadic People in Other Parts of the World

Pastoral nomadism, Johnson (1978) observes is a specialised livelihood form that is ecologically adjusted to the use of the resources of rainfall deficit environment .... Using the mobility inherent in their flocks, nomads all-over the world are able to adapt to the environmental instability of recurrent drought by shifting their activities to seasonally more favoured localities.

It is however important to pint out that nomadism as a lifestyle is not peculiar to Nigeria. Lar, (1986) observes that nomadism is practiced in many parts of the world for various reasons, ranging from freedom seeking, economy, to livestock rearing. She observes however that nomadism in Nigeria is mainly dictated by cattle rearing activities. Some of the nomadic groups all over the world include the English Gypsies; the irish and Scottish Tinkers; the United States Migrant Workers; the Aborigines and the nomads of Canada, Iran, Somalia and Australia; the Mesai, Nuer and Baggers Arabs in Africa; the Mongols and the Eskimos in the Polar Regions (Dogo, 1986; Ezeoma, 1982).

Despite the constant change of camping site that characterise the nomadic peoples of the world, Boneh (1984: 41) observed that sedentarisation (change from nomadism to sedentarisation) is a typical phenomenon among pastoral nomadic societies nowadays. He made the observations particularly among the Negev Bendowin and Barth (1961:124), made a similar observation among the Bassesi of South Persia.

This recent development is very important as Salzman has argued that sedentarisation leads to an unidirectional change from the traditional practices of pastoral nomadism towards gradual replacement of pastoralism with wage labour and other non-pastoral occupations. Dogo (1986) made a similar observation among the nomadic Fulani of Jabba District, Kaduna State.

As for the nomadic Fulani of Nigeria, deStcroix (1970 believes that the nomadic Fulani migrated East-ward from Senegal into Nigeria through the Hausa land of Gobir as early as the 13th Century. The need to maintain their livestock which are the live-wire of their economy has kept them spending the whole year in a cycle of periodic movements, travelling in the dry season from North to south or form upland to lowland, and back again in the wet. Although the orbit normally return to the same area every wet season. There are no permanent settlements - temporary camps are used throughout the year. (Mortimore, 1978).

Hopen (1958) however specifically says that the Bororos or the nomadic Fulani recognise five seasons of the year which are intimately bound up with their movements.

1. Dungu The wet season when grazing is good. The nomads spend this period in home grazing. It is usually in the raining season July-September.

2. Yawal or Yawnde This is the hot season after the rains, when surface water begins to dry from October-December.

3. Dabbunde The cool harmattan season, when crop residues are grazed after harvest, grass becomes scarce and trekking takes place to the south or the fadamas or river-rhine swamps December - February.

4. Cheedu The hot dry season when grazing and water are scarcest and the conditions of the animals (and the herders) are weaken February - April.

5. Seeto The stormy season, when rains make an uncertain start and herds return to their wet season grazing, balancing the risk of tse-tse against the need to allow time for the home grazing to recuperate May - July.
Mortimore (1978) further observes that the seasonal routes of the nomadic Fulani are thus determined by the distribution of pasture, water and tsetse flies.

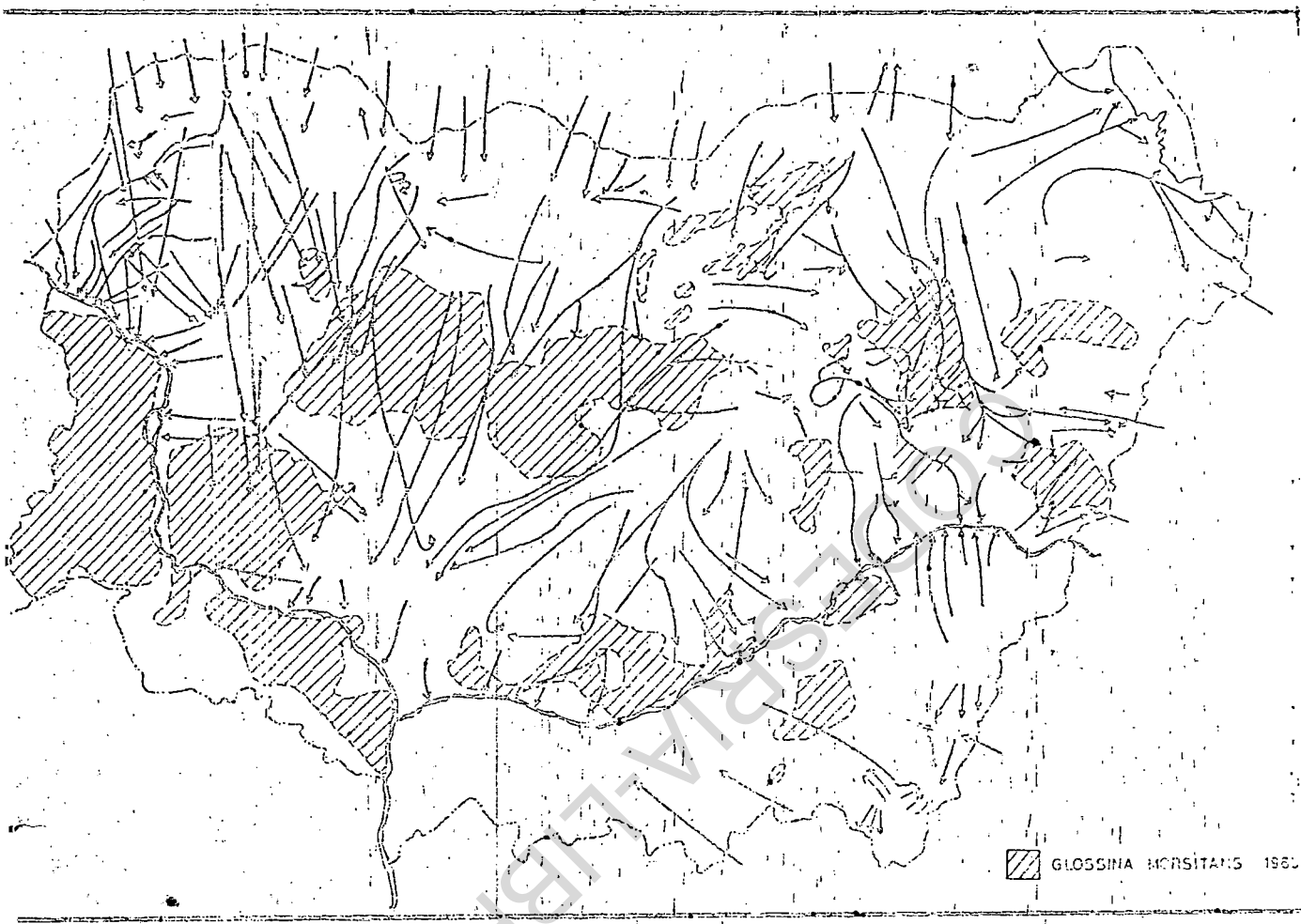


Fig. 2.6.1: General pattern of nomadic cattle movements

•ptcè after
•timore, 1978.

Several other factors include the demand for milk, which tends to be strongest in areas of dense population. Such areas also have abundant crop residues and they tend to be free from tsetse flies. He observes that pastures vacated by one group of nomads may be used by another group from further North and many herbs enter Nigeria from Niger Republic and Cameroon. He observes that Zaria area, for example, provides dry season pasture for herders from the North and they leave in the wet season; others from farther South to occupy. He also pointed out that the Jos Plateau has a large number of 'settled' full population since 1908 because the area is tsetse-free.

Recently, too, the National Concord of March, 7th, 1988 carried a report on how more cattle rearers in Hong, Gombe and Shong areas in Gongola State are now migrating to Bali, Jalingo, neighboring states and parts of the Cameroon Republic, due to constant attacks by bandits and cattle thieves who terrorise cattle owners. Consequently, cattle rearers are now migrating to areas where they would be safe to purse their means of livelihood.

From a rather descriptive perspective, Ezeomah (1982) categorises the movements of the nomadic Fulani into two categories. These are the short and long term movements.

The long-term trans-humance orbit is the intra-local government areas or inter-state which can go beyond national boundaries. Short distance movement could consist of both small and large groups. There are times that situations may warrant that the aged be settled while the younger ones move with the cattle, and occasionally come back to them to acquaint them with progress or check on their well-being. Similarly, Ezeomah (1982 talked of total and split and split movements of the nomads.

In general, Ezeomah (1986) observes that the seasonal movements of the nomadic Fulani have been motivated by many factors. Some of which are either their desire for independence and freedom from interference and supervision by sedentary authorities, freedom from cattle raiding, the avoidance of disease infested areas and as an over-riding factor, the never ending search for new pasture, and always necessary quest for people who do not own any land of their own.

In as much as what has been described thus far are facts or truth, since they have not been proved through specific scientific research, we shall take most of what has been said as speculations which lack figures to prove the credibility of such statements. In other words, there has not been any concert study of the migration patterns of the nomadic Fulani in Nigeria, not even on the Jos Plateau with minute details.

2.7. An Overview of Literature Review and Why this Study

From the foregoing reviews, we can make a number of inferences and observations. Rural-rural migration is a neglected aspect of population movement in Nigeria. To add to that Adepoju (1986) observes that to date, there is no comprehensive nation-wide migration survey that covers both rural and urban areas Simultaneously. It is also apparent from the above that the bulk of migration surveys per se have been confined to the south, mainly the south-western part of the country. In essence our knowledge of the migratory patterns in the Northern part of the country has been largely speculative. Adepoju observes that the summary of existing "popular" findings from the proliferation of migration studies in the country has been restricted mainly to the characteristics of the migrants, the typology of the migration (pattern, process, origin and the destination characteristics), motivation of migration, consequences, for origin and destination areas and policy issues. Admittedly, such a summary could be superficial, moreover, like all averages, subtle yet relevant findings, might be inadvertently submerged with more obvious and apparently "popular" findings. This has further made it difficult to piece the various migration data together in order to gain a comprehensive perspective of the level and pattern of migration in Nigeria.

It is no gainsaying, therefore, there is a paucity of data and knowledge on the phenomenon of migration, especially here in the North. In an attempt to solve the rural-rural migration issue in Nigeria, Udoh (1978) and Adepoju (1986) did some classical work on the area. It is rather unfortunate that they failed even to mention something about the nomadic Fulani who are essentially opportunists, who are literally 'here today and gone tomorrow'. Thereby constituting a special, distinct group of rural-rural migrants of Nigeria.

Furthermore, Ekanem (1972) observed that migration data which is a very important variable of population change (like births and deaths) constitute a crucial problem in Nigeria because of poor quality and lack of requisite vital statistical and suitable census data. Moreso, migration is a complex process varying over space and time in its scale, patterns and causes. Most of our 'One-Shot' surveys on migration have rather made the measuring of rate of migration difficult, (Conneil, 1978). In fact, it might not be wrong to say that most of what we presently know about migration especially here in the North and coupled with the poor methodological issues raised in the literature review, are speculations which have not been verified with concerted scientific research procedures. If that is what that obtains with migration studies in the Northern part of Nigeria, one can therefore wonder what obtains with that of the nomadic Fulani which is rather more obscure and intermittent.

Hence, the need, at least as a pioneer effort to describe the migration pattern of the nomadic Fulani of Jos and Bassa areas of the Jos Plateau, with details of practical implications is overdue and cannot be overemphasized.

CHAPTER THREE

DATA TYPES, SOURCES AND COLLECTION METHODS

3.1. Introduction

In order to answer the questions posed by the study (1.2) and to achieve the aims and objectives of the research (1.3), a skilful methodology of data collection is necessary. This Chapter is therefore devoted to the discussion of the nature, sources and methods of collecting the data needed for in this study. It also discusses the methods of questionnaire administration and the problem associated with the data collection.

3.2. Nature and Source of Data

The data needed for this study are numerous. Basically, the following information was sought for and obtained by the researcher: The demographic social and economic characteristics of the cattle Fulani in Jos and Bassa L.G.As. as defined by their ages, sex, religion. clan. household sizes, educational status and types and sizes of animal kept. Information pertaining to patterns and factors of migration of the pastoralist were also sought.

Two types of data are necessary for this study. They are of primary and secondary origins which are both quantitative and qualitative in nature. The primary sources of data include interviews and a well-structured questionnaire; and photographs taken in the field. The secondary sources include existing literature, records from the Local Government Headquarters at Jos and Rukuba; cattle tax (Jangali) offices, veterinary clinics, nomadic education centre of the Faculty of Education, University of Jos and other related functionaries that have data or information pertaining the nomadic people. The map of the study and other physiographic and climatic dat were obtained from the University of Jos, Department of Geography and Planning Map Library and Weather Observatory.

The questionnaire is the major instrument for data collection (See Appendix). The respondents were the nomadic (Cattle) Fulani that resided in the study area at the time study was conducted.

The questionnaire is broadly divided into five sections. The A Part contains the background information about the respondents. Question Number 1 - 10 sought for information on the name of the respondent, the location of the respondent's settlement (Ruga), the date of the interview;

the sex of the respondents; the sizes of the household; the religion of the respondent, his or her marital status, age, home, state, clan educational status, and types and sizes of animals kept.

The B Part of the questionnaire sought to find out information of the previous camping site and the factors of leaving the site for the present one. Questions 11 - 16 were designed to find out locations of previous grazing site, factors that led the respondent to leave, his duration of stay in the present site; mode of acquisition, his frequency of movements in the past five years and whether or not they go back to previous grazing points. Question 16 sought to find out whether the respondent intend to move in the future and if yes to where.

The C Part of the questionnaire deals with the pattern of movement in the dry season. Hence, questions 17 -23 sought to find out where the respondents normally graze their cattle during the dry season and how long they stay here. Question 19 sought to find out for how long the respondent has been grazing in that site. Question 20 sought to find out how often the respondents change their camp site during dry season. Question 21 sought to find out the distance which is covered during movements in dry season between camping site. Question 22 sought to find out whether respondent move as groups or individual families and if as group, how many of them move at a time. Question number 23 (i) sought to find out who decides whence movement should start. Question 23 (ii) sought to find out the major obstacles of migration.

The D Part of the questionnaire is a replica of all the questions in the C Part except that it contains questions asking information on migration activities in the wet season period.

The E Part does not contain any question but it is devoted to recording any relevant information or observation(s) made during the field surveys - which will further enhance the achievement of the aims and objectives of the study. The information obtained with the aid of questionnaire was supplemented by information obtained with the aid of questionnaire was supplemented by information obtained through field observations, oral interviews and photographs from the field.

3.3. Field Surveys

Three field surveys of varying intensity and significance were carried out for this study. These include the reconnaissance, the pilot and the main surveys which were carried out by the early morning visitation (baita) to the Rugas before the nomads take their livestock to the field or go to the market.

The reconnaissance survey was carried out between March 1st to 14th, 1988. During this period, the researcher spent a day in each sub-district, trying to locate the settlements and distribution of the nomads in the area using the various lists collected from source enumerated earlier on; also trying to note major migratory paths of the nomads who were just migrating from the Southern part of the Jos Plateau due to the onset of the rainy season. This period was also used for making friends and acquaintance with the nomadic Fulani.

The reconnaisance survey was followed by a pilot survey which lasted from March 30th to April 4th, 1988. During this period, some questionnaires were experimented upon. Few questionnaires were administered to selected household heads in Naraguta and Kuru areas of Jos L.G.A. and Rukuba area of Bassa L.G.A. This exercise revealed some problems and short-comings of some questions and the research in general. Subsequently, such questions (like question number 1) were made optional. Also, this exercise showed that some nomads whose names were contained in the listed sources had left. This automatically made the application of the randomly selected respondents unfeasible. The researcher therefore, resolved to use as many of the respondents as possible.

Similarly, due to the difficulties encountered during the pilot survey, the researcher realised that he needed the help of some persons who were familiar with the nomads so as to explain things to them and to gain their confidence so that they would respond to the questions accurately.

The main survey was conducted from April 18th the May 17th, 1988. This period was very suitable for this research because it was the period when majority of the nomadic Fulani start migrating Northwards following the onset of the rains. A check list and a follow-up to these surveys were also made in 1989.

3.4. Questionnaire Administration

In administering the questionnaires, the researcher employed the method of participant's observation in the field. Consequently, he administered all the questionnaires himself at the Rugas and in some cases at the field and the market squares as the situation demanded. This was achieved by the early morning visits before the nomads went out for the business of the day. However, this was accomplished with the presence of some field assistants. The interview was conducted in Hausa language.

As earlier noted, to gain the confidence and cooperation of the nomads, four field assistants who were Fulani themselves, and who have attained a little formal education were employed. The four field assistants have been engaged in the collection of data, and conducting field investigation concerning the nomadic Fulani from the centre of nomadic education, Faculty of Education, University of Jos, Jos.

A total of 360 questionnaires were administered. 190 in Jos L.G.A. and 170 in Bassa L.G.A. Table 3.4.1 shows the estimated households of the nomadic (Cattle) Fulani in the study area; and Table 3.4.2 shows the number of questionnaires administered in each of the districts in the study area.

Adepoju (1982) has pointed out that migration generally, is subjected to wide variations both temporarily and spatially. Hence, a large sample size which is also wide-spread is required to reduce high fluctuations in the observed data. A large sample of 360 respondents drawn from Jos and Bass L.G.As. were used for this study. However, the sample from any given district was proportional to the estimated size of the nomads it has (See Table 3.4.2.)

TABLE 3.4.1.

Estimated Households of the Nomadic Fulani in Jos and Bassa. L.G.As

District	Local Government Area	Estimated Households
Rukuba	Bassa	91
Amo	-do-	56
Miango	"	40
Buji	"	49
Jere	"	74
Kwall	"	71
Forom	Jos	50
Jarawa	"	102
Gwong	"	55
Jos	"	42
Gyel	"	52
Du	"	47
Vwong	"	53
Kuru	"	65
		817

Source: Veterinary Clinic, 1984.

TABLE 3.4.2

Sampling Distribution of Questionnaires in the Study areas

District	Estimated Households	%	No. of Questionnaires Issued	%
Rukuba	91	11.14	40	11.11
Amo	56	6.85	25	6.94
Buji	40	4.90	22	6.11
Jere	49	6.00	24	6.67
Miango	74	9.06	31	8.61
Kwall	41	5.02	28	7.78
Forom	50	6.12	24	6.67
Jarawa	102	12.48	39	10.83
Gwong	55	6.73	19	5.28
Jos	42	5.14	34	9.44
Gyel	52	6.36	18	5.00
Du	47	5.75	16	4.44
Vwong	53	6.49	15	4.17
Kuru	65	8.00	25	6.94
Total	817	100	360	100

Source: Field survey, 1988.

3.5. Data Collection Problems

One of the major problems often encountered by researchers among the nomadic peoples is their reluctance to allow any 'outsider' to intrude or investigate their problems. This problem was encountered in this study for the nomadic Fulani were reluctant to answer some questions. Dogo (1986) has observed that they did not like to answer questions that seek for information on the sizes of their herds and households. Thus, these nomads deliberately distorted information about their ages, sizes of herds and households.

Nevertheless, during the field study, the response rate was fairly high because of the field assistants who were experienced and informed nomadic Fulani boys themselves. These boys were no 'outsiders' to the nomadic Fulani. Moreso, the interview was conducted in Hausa.

Also, whole at the Ruga conducting the interviews, the researcher maintained a friendly outlook and guarded against doing or saying anything that did not conform to the customs of the nomads, like disrespect to elders, frightening the cows, crossing the ropes (Dangoli) which they used in tending the calves. In some cases too, pleasantries like kola-nuts were brought for the respondents in order to solicit for their cooperation.

Many field photographs were taken to illustrate the migration processes of the nomadic Fulani in the study areas but a large number went bad during the processing. Consequently, the researcher resorted to use photos of secondary origins as substitutes.

3.6. Data Analysis and Presentation

The data which resulted from the field surveys have been summarised and presented in Tables, Figures, Plates, Percentages, Charts and Histograms. Appropriate statistical techniques were employed where necessary. Moreso, the questionnaire was designed in such a way that it is possible to manipulate the data either manually or through computer by coding the information. The data analysis for this study was however done manually.

CHAPTER FOUR

MIGRATION PATTERNS OF THE NOMIDIC FULANI IN JOS AND BASSA L.G.As.

4.1. Introduction

In order to achieve the aims and objectives of this study outlined in 1.3, data from field surveys were collected on a wide range of variables which include the basic background information about the respondents and their pattern and factors of migration. This chapter presents, analyses and discusses the various data collected from the field. The chapter is divided into three sections. The first part presents basic demographic data about the respondents, the second and third parts describe their movement patterns during the dry and wet seasons respectively.

4.2. Background Information About the Respondents

The distribution of the 360 respondents district by district is shown in Table 3.4.2. According to the Table, 47% and 53% of the respondents were form Bassa and Jos L.G.As respectively.

The demographic structure of the respondents is summarised in Fig. 4.2.2 and Table 4.2.1. Out of the 360, (350 respondents or 97 percent) were males, while 10 (or 3 percent) were females. Thus it is predominantly the male nomadic Fulani who own and rear the cattle. The age distribution of the respondents is provided in Table 4.2.1 and Fig. 4.2.1. According to the table and figure, 18% of the respondents were below age 30 years; 37% between 31-45 years; 31% 46 - 60 years and only 14% were aged 60 years and above.

We present data on the marital status of the respondents in Table 4.2.2.

TABLE 4.2.2

Marital Status of the Respondents

Marital Status/sex	single	Married	Divorced	Widowed	Total	%
Male	2	346	-	2	350	97.22
Female	-	2	2	6	10	2.78
Total	2	348	2	8	360	
%	0.55	96.67	0.55	2.22	100	100

Source: Author's Field work, 1988.

FIG. 4.2.1 AGE DISTRIBUTION OF THE RESPONDENTS

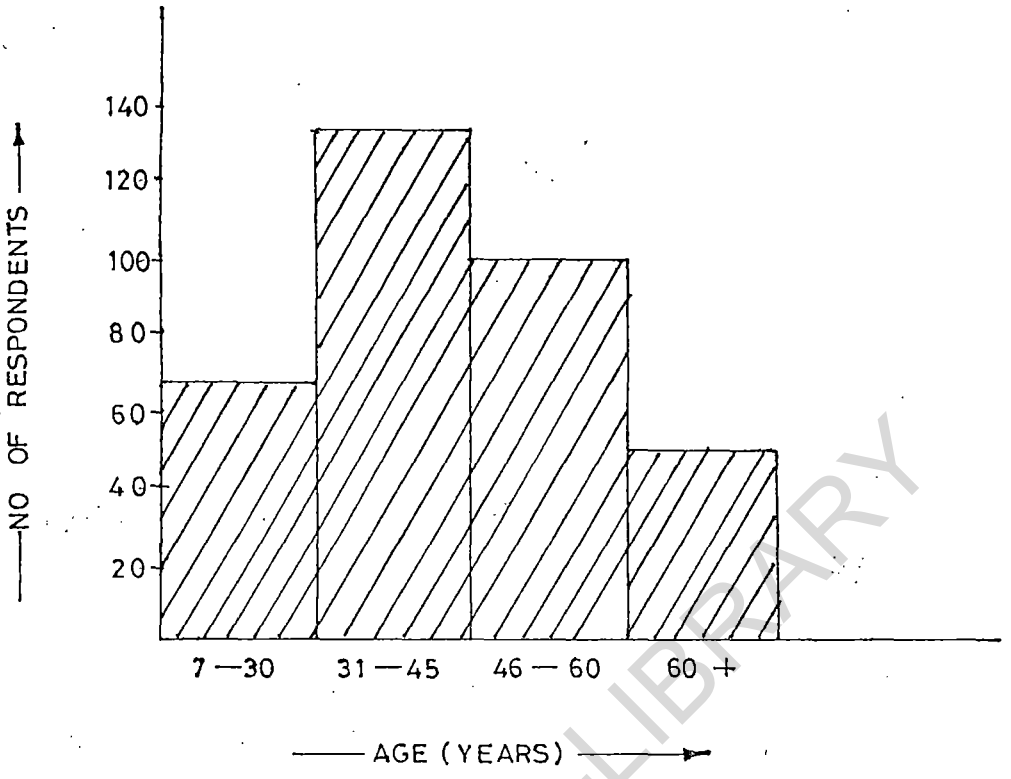
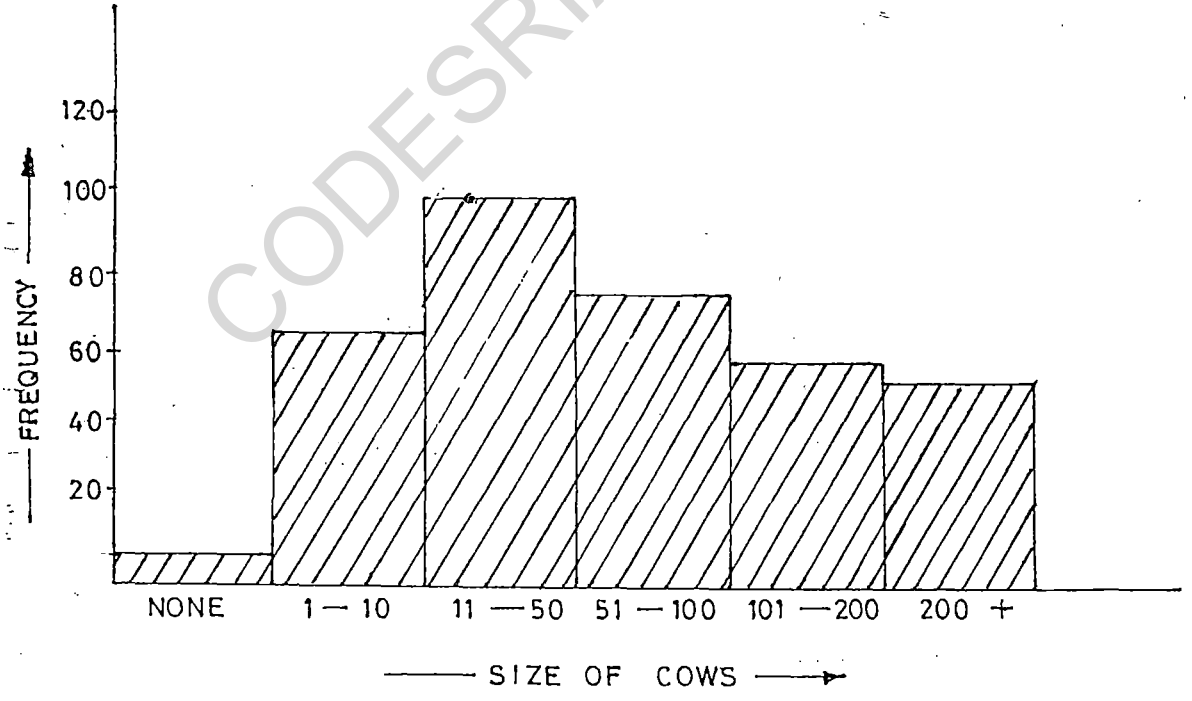


FIG. 4.2.3 · SIZE OF HERD OF THE RESPONDENTS



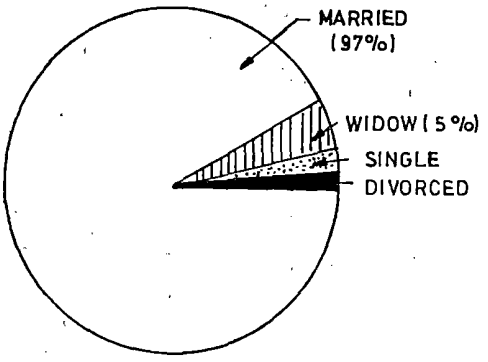


FIG. 4.2.7 MARITAL STATUS OF THE RESPONDENTS.

SOURCE :- AUTHOR'S FIELD WORK, 1988.

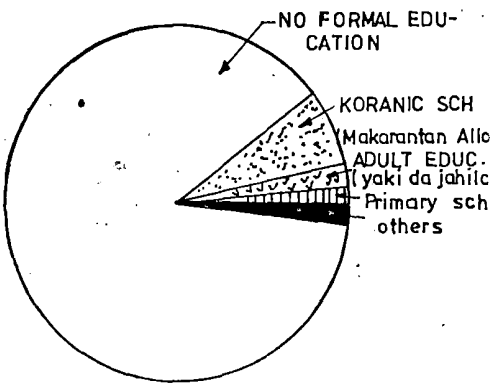


FIG. 4.2.2 EDUCATIONAL STATUS OF THE RESPONDENTS.

SOURCE :- AUTHOR'S FIELD WORK, 1988.

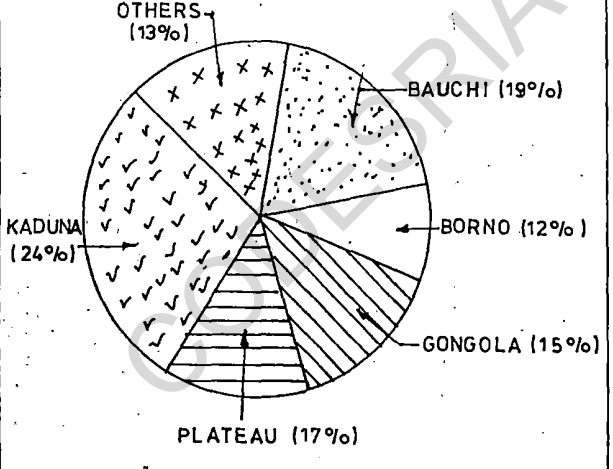


FIG. 4.2.8 THE STATE OF ORIGIN OF THE RESPONDENT.

SOURCE :- AUTHOR'S FIELD WORK, 1988.

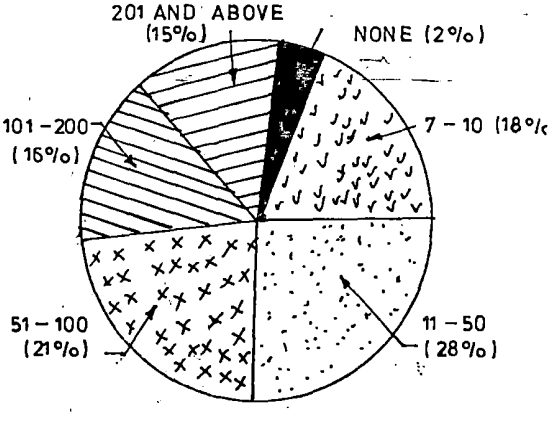


FIG. 4.2.4 SIZE OF COW HOLDINGS PER HOUSEHOLD (%).

SOURCE :- AUTHOR'S FIELD WORK, 1988.

According to Table 4.2.2; 97% of the respondents were married, while only 3% were widowed - 8 o whom women. Perhaps there were women who had to take-over the mantle of headship of the households after the death of their husbands.

The educational status of the respondents is shown in Table 4.2.3 and Fig. 4.2.2. According to these, 61% of the respondents did not have any formal education; 20% attended Koranic School; 6% attained adult literacy class and only 8% had primary school education and 5% had acquired post-primary qualification. The level of education of respondents from settlements in and around Miango, Zabolo and Jos was higher than those of other settlements.

TABLE 4.2.4.

Household Sizes of the Respondents

Household Sizes/ Settlement	1	2	3	4	5	6	7	8	9	10+persons/HH	Total
Rukuba	1	9	8	12	5	3	–	–	–	2	40
Amo	2	3	6	4	3	–	–	–	1	6	25
Buji	1	5	5	6	1	–	1	1	2	–	22
Jere	–	3	6	3	4	–	1	1	2	4	24
Miango	2	4	5	6	3	1	2	–	–	8	31
Kwall	2	3	4	5	2	2	2	1	–	7	28
Jorom	2	2	5	2	3	–	–	1	–	9	24
Jarawa	3	7	12	6	1	3	1	–	–	6	39
Gwong	1	2	3	4	3	2	1	–	–	3	19
Jos	1	2	5	5	6	3	4	1	–	7	34
Gyle	1	2	3	4	3	–	–	2	1	2	18
Du	–	2	4	7	2	–	1	–	–	–	16
Vwang	1	1	3	2	4	–	–	1	1	2	15
Kuru	1	5	2	3	5	2	1	1	3	3	25
Total	17	50	71	69	45	16	14	9	10	59	360
%	4.72	1390	19.76	19.22	12.55	447	3.90	2.57	2.78	16.38	100

Source: Author's Field work, 1988.

Table 4.2.4 shows that 65% of the respondents had households of 2.5 persons; 14% had a large family of 6 – 9 persons. Up to 16% of the respondents had a family size of above 10 persons.

We illustrate the distribution of the respondents by religion in Table 4.2.5.

TABLE 4.2.5
Religion of the Respondents

Sex/ Religion	Male	%	Female	%
Christianity	6	1.67	–	–
Islam	354	98.3	10	2.77

Source: Author's Field work, 1988.

According to this table, 98% of the respondents were moslems; while less than 2% were christians.

The clan distribution of the respondents is depicted in Table 4.2.6.

TABLE 4.2.6

Clan of Respondents

Clan	Bororo'en	Wuntisen	Dagamai'en
Example of Clan	Gyoroji'en	Tulakwa'en	Kachechero'en.
Numbers	148	116	96
%	41.11	32.22	26.67

Source: Author's Field work, 1988.

From this table, we deduce that 2 out of every 5 Fulani nomads in Jos and Bassa L.G.As. belonged to the Bororo'en Clan, while 59% belonged to Wunti'en and Dagamai'en ethnic clan.

Similarly, the state of origin of the respondents is shown in Table 4.2.7.

TABLE 4.2.7

State of Origin of the Nomadic (cattle) Fulani in Jos and Bassa L.G.As

State	Bauchi	Borno	Gongola	Plateau	Kaduna	Others	Total
No.	68	43	54	61	87	47	360
%	18.90	11.94	15.00	16.94	24.20	13.05	100

Source: Author's field work, 1988.

Table 4.2.7 reveals that almost one-quarter of the respondents were from Kaduna State. 17% are indigence of Plateau State; 19% from Bauchi State and 13% from other States. In fact, some of them claimed that they originated from the Republics of Cameroon, Niger and Binin.

We present data on the livestock distribution of the study area in Table 4.2.8.

According to Table 4.2.8, the respondents had a total of 27,142 cattle, 11,942 sheep; 253 goats and 283 poultry. These represent an average of 75 herds of cattle, 33 sheep and less than 1 goat per nomadic Fulani household in Jos and Bass L.G.as. Field observation revealed that the goats wee mainly owned by the more settled groups.

TABLE 4.2.8

Livestock Population per District

L.G.A.	District	No. of Household Interviewed	Livestock Population Cattle	Sheep	Goats	Poultry	Others
Bassa	Rukuba	40	2891	1218	16	26	2
"	Amo	25	1781	973	12	38	-
"	Miango	22	2611	861	26	28	1
"	Buji	24	1704	321	13	15	-
"	Jere	31	2608	1671	12	17	1
"	Kwall	28	1878	1538	9	8	-
Jos	Forom	24	2168	1218	21	21	-
"	Gwong	39	1486	668	20	28	-
"	Jos	19	3216	1268	31	36	2
"	Gyel	34	2169	211	21	18	-
"	Du	18	1638	315	9	8	-
"	Vwang	16	1348	349	10	7	-
"	Jarawa	15	1561	121	13	14	-
"	Kuru	25	1861	1210	40	19	-
Total		360	27,142	11,942	253	283	6

Source: Author's field work, 1988.

Other types of livestock kept include horses and donkey. The major concentrations of cattle are found in and around Rukuba, Miango, Hoss, Jere, Zangon Dinya, Naraguta, Jos Gyel.

Table 4.2.9 and Fig. 4.2.4 show that 52% of the respondents had between 51 - 100 herds of cattle.

FIG. 4.2.5 DURATION OF STAY IN THE PRESENT GRAZING SITE.

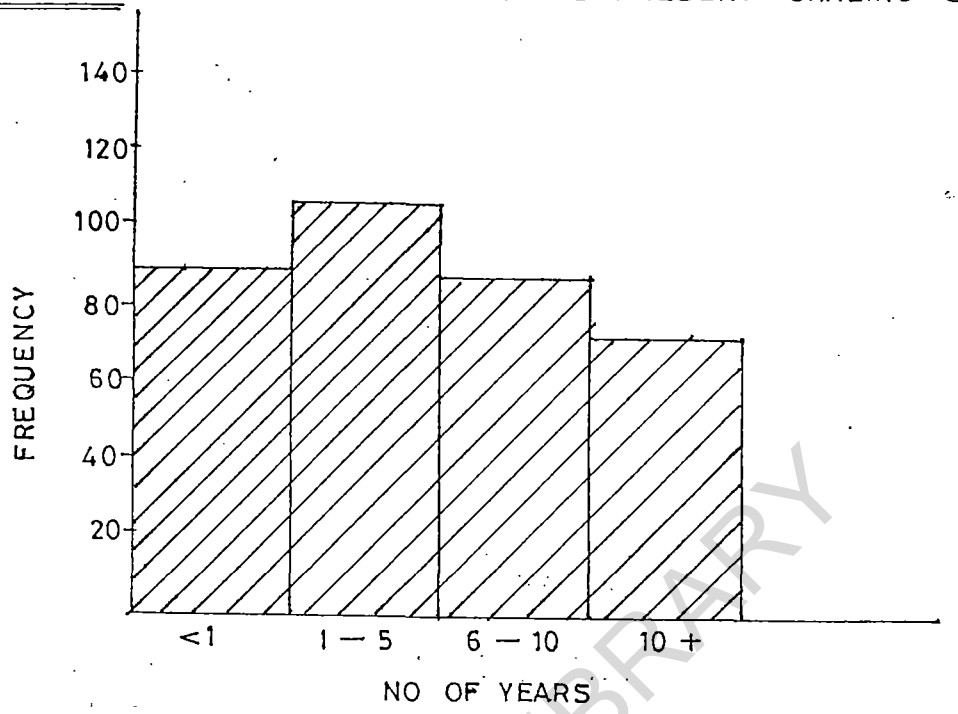
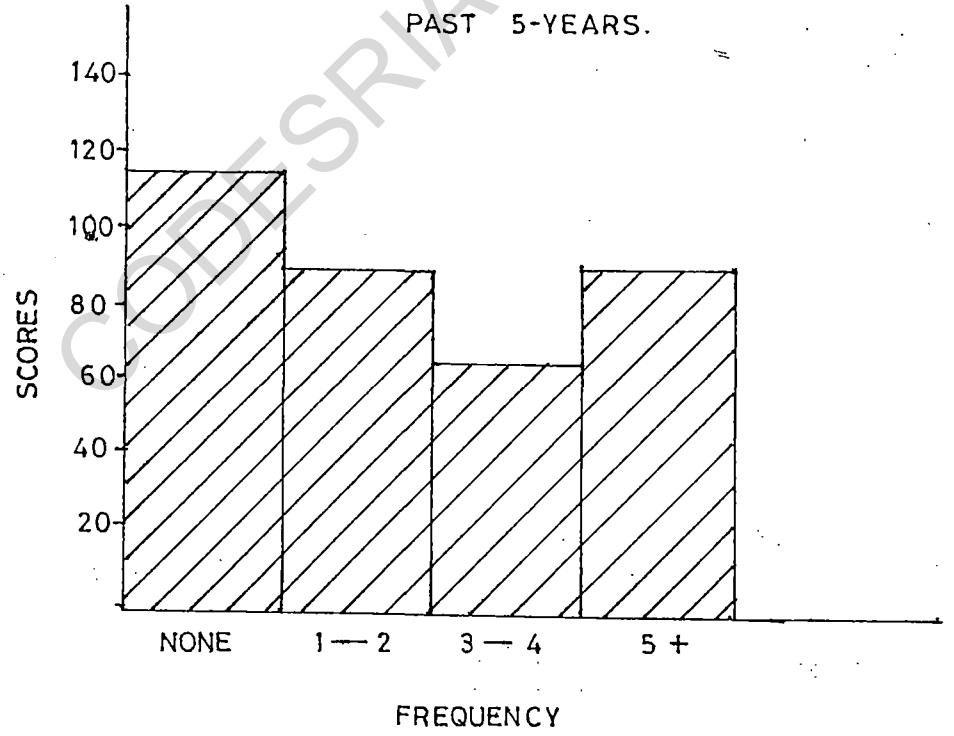


FIG. 4.2.6 FREQUENCY OF CHANGE OF GRAZING SITE FOR THE PAST 5-YEARS.



SOURCE :- AUTHOR'S FIELD WORK, 1988.

TABLE 4.2.9

Size of Herds of the Respondents

Size	Frequency	%
None	6	1.67
1-10	65	18.05
11-50	101	28.05
51-100	76	21.11
101-200	58	16.11
201+	54	15.00
{	360	100
x	60	

Source: Author's Field work, 1988.

Table 4.2.10 and Table 4.2.11, Fig. 4.2.5 and 4.2.6 show the duration of stay of the respondents in the present grazing site and the frequency of change of grazing site for the past five years.

TABLE 4.2.10

Duration of Stay in the Present Grazing Site

No. of Years	Frequency	%
1	91	25.28
1-5	108	30.00
6-10	88	24.45
10+	73	20.27
Total	360	100

Source: Author's Field work, 1988.

According to the Table and Figure, about 25% of the respondents had spent less than one year in the present grazing site. This group consisted mainly those who were on their way passing through the study area during the field surveys. Fig. 4.2.6 however indicates that there is a tendency towards less frequent change os settlement.

4.3. The Migration Patterns during the Dry Season

Data on the migration patterns of the nomadic Fulani in Jos and Bassa L.G.As. of Plateau State are presented in Fig. 4.3.1. The figure reveals that there were four major pathways for the movements of the nomads in the study area. They are:

1. The South-Western (SW) edges of the Jos Plateau route which stretches from Miango, Zangon Kataf (Kaduna State) to Kachia and Gantan (across river Gurara tributary) to the Federal Capital Territory and Niger State.

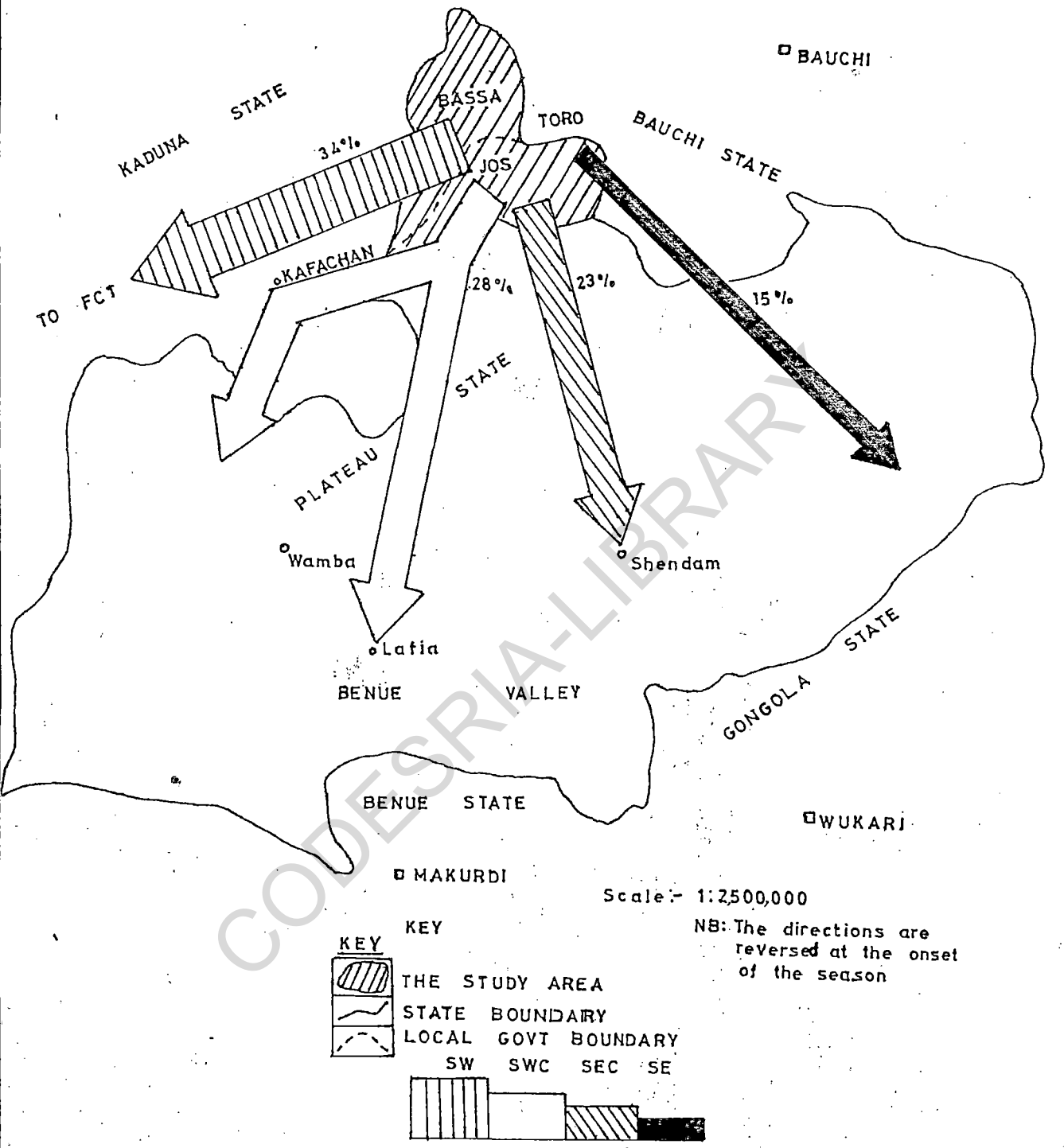


Fig 4-31 Dry season migration routes of the Nomadic Fulani in Jos and Bassa Local Government Areas.

SOURCE :- Author's FIELDWORK 1988.

2. The South-Central (SC) route which stretches from Jos to Bukuru, Vom and Kuru (the Eastern edge of the Plateau) where some sort of branching takes place. Some groups take the route which leads to the Kagoro hills and Kafanchan Plains in Kaduna State; while the second group migrated to Wamba area where they ultimately move to Benue Valley.

3. The South-Western (SW) route leads from Jos to Fusa to Panyam, Pankshin and Wase. At wase, some groups migrate to the Mambilla Plateau in Gongola State; while the second group moves to the Benue Valley. Another attributable reason for the branching here is the presence of the escarpment in this area.

4. The last route is the eastern edge of the Plateau (SE) route which extends from Toro (Bauchi State) to Shere (Plateau State) to Lere (Bauchi State), Boi (Bauchi State), Dawaki, (Plateau State), Amper and Finally to Gongola State and the Cameroon Mountains.

According to the information provided, over one-third of the respondents graze their cattle in the Southern part of Kaduna State, and Federal Capital Territory during the dry season. About half of them search for pasture in the Benue Valley and few others in Gongola and the Cameroon. The data available also show that the nomadic Fulani cover very long distances, varying from 2 - 6 weeks in the dry season.

This obstacles to migration during the seasons are presented in Table 4.3.1.

This table reveals that the major problems which confront the nomadic Fulani during the dry season include: Lack of water, out break of cattle diseases, inadequate grass, clashes with sedentary peasants over residues of crops and damage to farm crops. Data available also indicate that the propensity to change grazing site is higher during season than rainy season because of the search for pasture and water which have become scarce.

Similarly, field observations indicated that the movement of the cattle Fulani in the dry season is 'Total'. That is, the whole Ruga moves with the livestock to a new grazing site, in groups of 6 - 12 families. Usually it is the eldest person in household who decides when and where to move to. However, it is the virile groups that start the movements; while the older persons and pregnant women follow at the rear with few loads. (See Plate 1).

TABLE 4.3.1

Obstacles to Migration of the Pastoralist during the Wet and dry Seasons

	Migration Obstacles	Scores	Wet Season	Dry Season
1.	Births of Cattle		52	32
2.	Births of Humans		8	12
3.	Floods		100	4
4.	Outbreak of Diseases		60	160
5.	Tired-ness and Weariness		68	84
6.	Cattle theft		44	64
7.	Lack of Water		6	172
8.	Lack of Grass		2	130
9.	Clashes with the Sedentary Peasants		134	88
	Peasants		94	82
10.	Other Obstacles		31	16

Source: Author's Field work, 1988

4.4. The Migration Pattern During the Wet Season

We summarise the migration pattern of the nomadic Fulani in Jos and Bass L.G.As during the wet season in Fig. 4.4.1. According to the information provided by the respondents, 58% of the nomadic Fulani in the study area graze their cattle in and around Jos and Bassa L.G.As. and other parts of Plateau State. Unlike in the dry season, movements take place over relatively short distances.

One marked feature of the wet season movement is that only part of the family moves. This is referred to as the 'split' movement. In this type of movement, the Rugas do not move as a whole. It is only few cows that are taken to places where the pastures are greener. A few others, especially the weak ones are left at the home base for milking purposes. The older people do not participate in this type of movement. Few cows that are left behind engage in an indeterminate pattern of migration.

Another interesting thing about the wet season migration is that there is a north-ward movement of the cattle into the Sahel and sudan Savannah Regions of Nigeria. For example, 6% of the respondents indicated that they migrate even as far as Maraku, Ririwai in Kano State (NC), 7% grazed their cattle towards the north-west (NW) direction, even as far as Kubau, Dutsin Wai, Anchau and Yarkasuwa in Kaduna State. 14% however indicated that they grazed their cattle in Toro, Nabardo, Bununu, Das, Zalau and Tulu in Bachi State (NE).

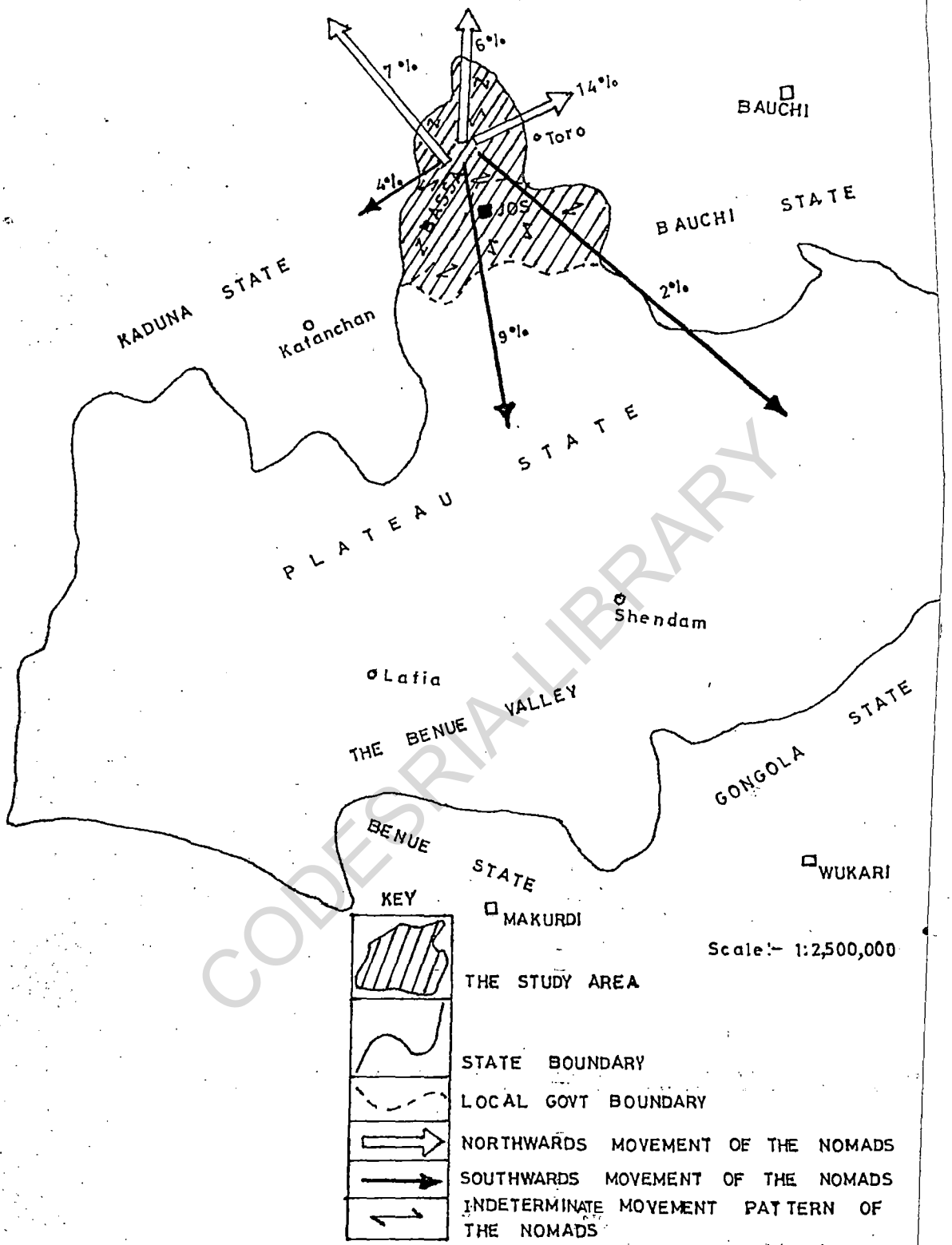


Fig 4.4;1 The Wet season movement pattern of the Nomadic Fulani in Jos and
SOURCE: Aurthor's FIELDWORK 1988.

Nearly 9% of the respondents still graze their cattle around Barakin Ladi towards the south and some of them occasionally went as far as Benue Plains. 2% still migrate even as far as to Gongola State. 4% also move to Saminaka and Chawai areas, especially at the onset of the new rains.

Furthermore, unlike the dry season migration, only small distances are covered, in wet season. Thus, though the distances covered between old and new grazing site might be similar, Table 4.3.1 shows that floods, especially those caused by the over-flowing of river banks due to the heavy down pours of some early rains cause some delays in the movement. Part of the other obstacles of movement during the wet season is the clashes of the nomads with the sedentary cultivators. Usually, problems start when the cattle eat the shoots of crops of the farmers.

The major outlets and/or inlets of the pastoralist are presented in Fig. 4.4.2. Some inter-state exit points could be found at Kan-iyaka, Rukuba and Miango (between Plateau and Kaduna State) Maijuju (between Gongola and Plateau State); Fusa, Lere and Toro (between Plateau and Bauchi State).

Similarly, there are some intra-local government exit points, which are mainly concentrated in the southern parts of the study area. Some of these points are Vwang, Kuru, Vom and Forom. Most of these outlets and inlets lead to the Benue Valley. These points could serve as strategic locations for trapping and monitoring the movements of the nomads. For example, cattle census could be conducted at such points during the onset of the seasons. These places, too could be used as designated areas, permanently left as pathways for cattle tracks. They could also serve as points for tackling cattle diseases like livestock inoculation points.

4.5 Testing of Hypothesis I

From what we have described in Figs. 4.3.1 and 4.4.12, there seems to be a tendency for the movements of the nomads towards one direction to predominate in one season. and to show whether this tendency is significant or not, we now test the Null Hypothesis (H_o) that:

There is no significant variation in the direction of movement of the nomadic Fulani (in Jos and Bass L.G.As.) between and within the wet and dry seasons .

Against the research Hypothesis (H_1) which states that:

There is a significant variation in the direction of movement of the nomadic Fulani between and within the wet and dry seasons.

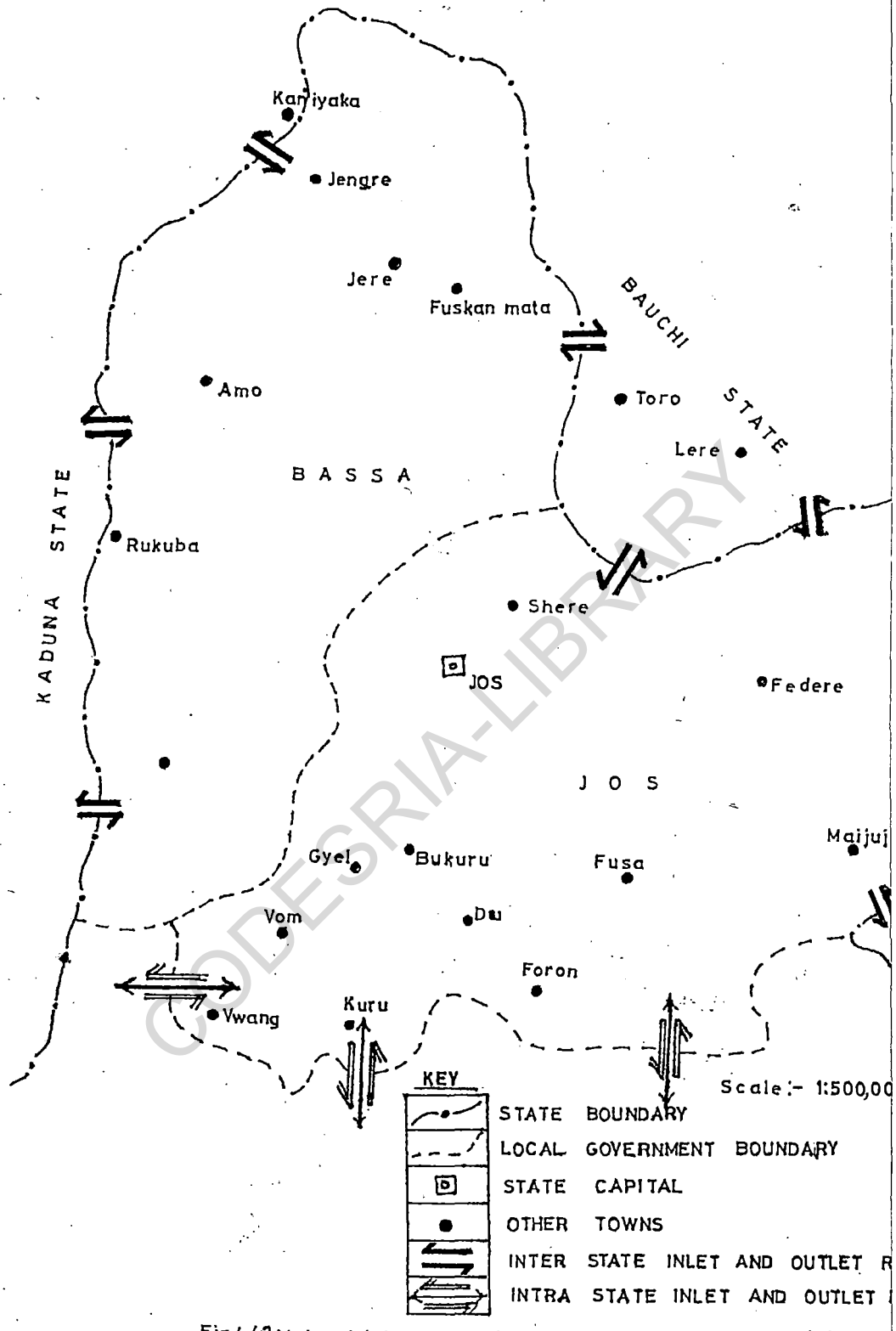


Fig 4-42 Major Inlet and/or Outlet routes of the Pastorialists.
SOURCE: Aurthors FIELDWORK 1988.

TABLE 4.5.1

Distribution of Respondents by Direction of Movement in wet and Dry Season

Direction/ Season	SW	SWC	SEC	SE	NC	NW	NE	Un-determinate direction	Total
Dry Season(no)	122	101	83	54	0	0	0	0	360
Wet Season(no)	14	0	33	7	22	25	50	209	360
Total	136	101	116	61	22	25	50	209	720

Source: Author's Field work, 1988.

We shall use the Chi-Square test to test our hypothesis stated above (see Appendix 2). From our calculations, the observed and expected values are given thus:

	SW	SWS	SEC	SE	NC	NW	NE	Un-determinate Direction	Total
Observed Values	136	101	116	61	22	22	50	209	360
Expected Values	68	50.5	58	30.5	11	12.5	25	104.5	360
									720

Calculated

$$X^2 = 360$$

χ 0.05 = 14.1; χ 0.01 = 18.5 at

Degrees of Freedom = K - 1 = 8 - 1 = 7

Decision

From our computation above, since the calculated value of 360 is greater than the theoretical value of 18.5 at 0.01 probability, we reject the null hypothesis (H_o) and conclude that a significant variation exist in the direction of movement of nomadic Fulani in Jos and Bass L.G.As in the we and dry seasons.

CHAPTER FIVE

THE FACTORS OF MIGRATION

5.1. Introduction

This chapter focuses attention on the factors of migration among the nomadic Fulani of Jos and Bass L.G.As. These factors are analyzed and their results presented. Issues arising from the patterns and factors of migrations are also discussed. The likely migratory trend in the future is also highlighted.

5.2. The Factors of Migration

There are various but inter-related factors which influence the direction, the time to migrate and the intensity of migration among the nomadic Fulani of Jos and Bassa L.G.As.

Generally, we can broadly divide these factors into the 'Push' and 'Pull' factors (Lee, 1966). The pull factors are those ones which attract the pastoralist to the present grazing site; and the push factors are the combination of those unfavorable conditions which literally force the nomads to leave their former camping sites for new ones. The push and pull factors that influenced the 360 nomadic Fulani in Jos and Bassa L.G.As. to leave their former grazing sites to the present one are presented in Table 5.2.1 and Fig. 5.2.1.

Table 5.2.1 shows that the need to search for good water supply, which the mining ponds on the Jos Plateau offers; and the abundance of lush pastures are some of the most important pull factors which motivated and attracted the nomadic Fulani to Jos and Bassa L.G.As. This is not surprising because cattle are the life-wire of the economy of the nomadic Fulani (Hopen, 1958). In fact, it appears as if the welfare of the livestock takes precedence over that of the human beings.

TABLE 5.2.1

Factors that influenced the Respondents to Leave Former Grazing Sites to present One

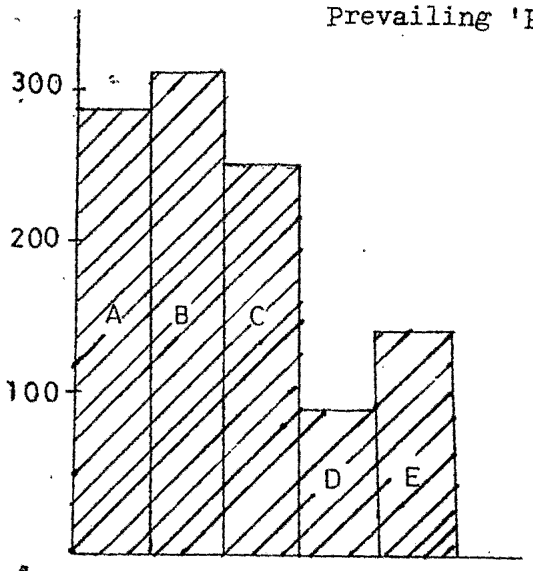
Prevailing 'Pull' Factors in the Grazing Ground	No.	Prop. %	Prevailing 'push' Factors Present in the Former Grazing Site	No.	Prop %
1. Availability of water	287	79.72	Lack of water	287	79.72
2. Avail. of Pasture	310	86.11	Insufficient past.	310	86.11
3. Absence of Cattle diseases	251	69.72	Presence of cattle diseases	251	69.72
4.			Onset of the seasons	90	25.00
5.			Conflicts with sedentary peasants	125	34.72
6.			Conflicts with relatives	39	10.83
7. Availability of freedom	90	25.00	Lack of freedom	90	25.00
8.			Conflicts with Government Officials	35	9.72
9.			Local of Cattle	58	16.11
10. Other factors	139	38.91	Other factors	139	38.61

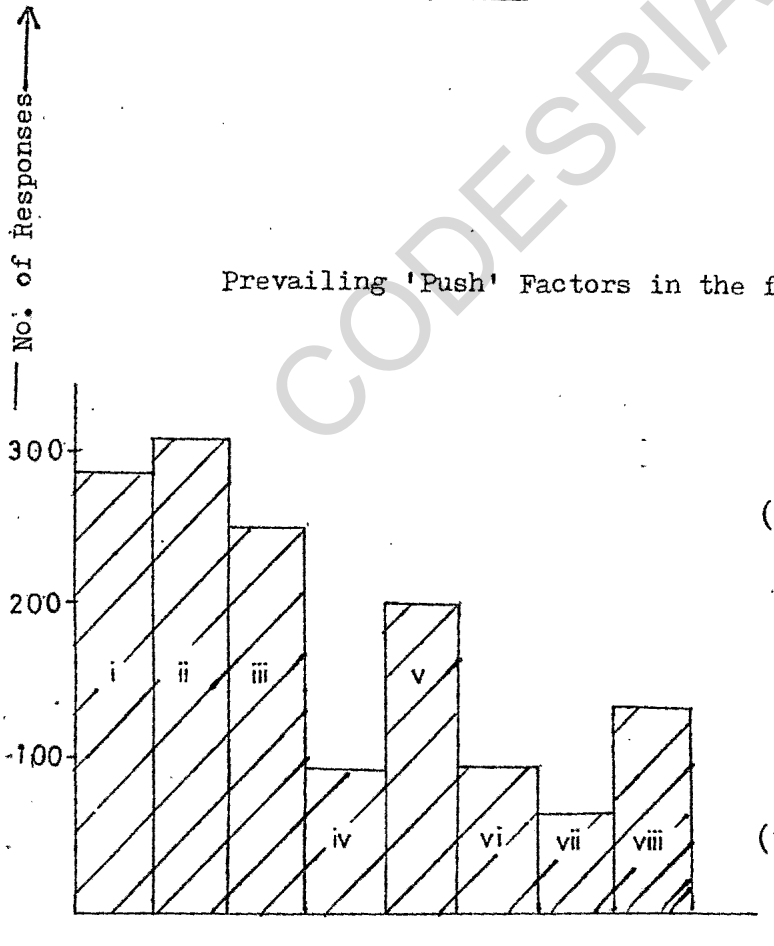
Source: Author's Field work, 1988.

It is important to note that each movement is motivated by many factors which are not necessarily mutually exclusive. For example, a factor, like the availability of pasture and water in a given suite has the propensity to attract the nomads; but they are however restrained by other factors of movement like the presence and/or absence of cattle diseases and water-logged conditions in that site. At the same time a factor which could act as a pull factor in one circumstance can equally act as a push factor in another one. For example, at the onset of the rains, the nomads migrate to the north not necessarily due to the availability of pastures and water but this period also marks the advent of certain insects whose biting are deadly to cattle (e.g. Tsetse flies) Hence the nomads are literally forced to move away from the infested areas and they find refuge on the Jos Plateau, which according to Mortimore (1978) is tsetse-free.

It suffices to say that many 'push' and 'pull' factors are involved in the migration patterns of the nomadic pastoralist. Some factors like the availability of pastures and water act as catalysts. But the roles of these catalysts vary with the seasons and the particular time and place of movement involved. (See section 5.5 for the test of a related hypothesis).

Fig. 5.2.1 Factors of Migration





Source: Author's field work, 1988.

Data analysis from the field also indicated that 73% of the nomads always go back to previous grazing sites, especially when these places were favorable to the cows. Unfavorable environments, for example which led to a great loss of cattle are often avoided either temporarily or permanently. Similarly, where good relationships existed between the nomads and their neighboring sedentary cultivators also lead the nomads to go back to previous grazing sites. But camping sites that have witnessed many clashes between the nomads and the sedentary peasants, perhaps, due to deliberate pollution of water with chemicals by the peasants, physical injuries meted to the cows and a situation where the cattle ate up the farm residues (without permission) and crops of the peasants have always ended up in quarrels and physical assaults. some of the clashes resulted in litigations in courts which the nomads dread. A probable explanation could be that apart from their distaste of confrontation with government officials, some of these court cases are time consuming - thereby wasting their opportunities of pursuing other pastoral interests and productive ventures.

5.3 Practical Issues Arising From the Factors and Patterns of Migration of the Pastoralist

We have already provided information on the social, economic and demographic characteristics of the respondents in 4.2. Furthermore, we described their migration patterns during the wet and dry seasons in Section 4.3 and section 4.4 respectively. The motivating factors of migration of the pastoralist were also discussed in Section 5.2. From managerial and planning points of view, practical issues of great importance from these data deserve mentioning and critical comments. Some of them have been discussed in our previous analysis of data and presentation. We shall however pinpoint few others ones here.

The constant search for water and pastures and other interrelated factors have perpetually kept the nomadic Fulani in Jos and Bassa L.G.As on the move. These movements have thus constituted a necessary evil from the managerial and planning perspectives. Among others, some of the major disadvantages of constant migration include; The productivity of the livestock is greatly reduced. The cows also age very quickly, the weight of the cows is reduced, this also leads to reductions in meat and milk output, hence returns are poor.

The constant movements have also helped to spread livestock diseases like Rinderpest, (Ciwon-bushiya), Anthrax (Ciwon Sefa), Streptothricosis (Kirchi), Babesiosis (Sammore); Contagious Bovine Pleu ropneumonia (CBPP); Brvcellosis (Bakkale) and Blackquarter (Harbin-Daji). Cattle tracks are always infested with flies- this creates many human discomfort and diseases.

The dispersion and isolation of the nomadic Fulani in the country-side have more or less alienated them from the effective utilization of urban services (Onazi, 1988). For example, most of the veterinary clinics are concentrated in the urban centres. This has rendered the provision of adequate veterinary care to the livestock very difficult. The constant migration has also made the curbing of cattle epidemics rather difficult, and carriers of these diseases find it rather easy to spread it on even to the health ones as they migrate. Thus, the movement of the nomads has rendered the management of cattle diseases very difficult.

Similarly, constant movements have made it rather difficult for the nomadic Fulani children to have formal education. This is because, they are always on the move and wherever they settle, they do not form a threshold population. Moreso, there is a scarcity of manpower and funds to operate not even the conventional school systems in Nigeria, talk-less of a more specialised one like the mobile schools which have found to be a better alternative for the nomads.

Also "the slit movement which is practiced in wet season constitutes the major hinderance to the mobile school system". *This is because it divides the would-be-nomadic-students into smaller units which do not form a threshold population in a class. Moreso, it leads to inconsistency in the implementation of the school curriculum due to intermittent interruption caused by changing of grazing camp.

One other feature of nomadic Fulani is that occasionally, the decision to migrate is taken suddenly. This normally happens whenever a misfortune occurs, such as a sudden outbreak of cattle diseases or whenever there are clashes with the sedentary cultivators and disagreement with governmental officials. Such sudden decisions to move therefore render the migratory trends of the pastoralist rather unpredictable. Consequently, effective planning and the allocation of facilities like grazing reserves and watering points are rendered very difficult.

From the environmental point of view, it is no secret that overgrazing by the livestock destroys the vegetation. similarly, major cattle tracks serve as rills which later develop into gullies.

* Interview with Associate Prof. C. Ezeomah, a specialist for nomadic education, University of Jos, Jos, Nigeria. 9/6/1988.

Consequently, it is not reasonable to assume that the soil erosion problems of the Jos Plateau are caused by tin mining activities alone; but also, by the uncontrolled grazing activities of the Fulani cattle.

The consequences of migration as highlighted above do not mean that it does not have some advantages. For example, as the nomads move along, they become integrated with the sedentary farmers. This facilitates quick spread of innovations. They also establish good relationships which also attract them to previous grazing sites.

Furthermore, the constant movement affords the nomadic Fulani opportunities to harness the pastoral resources interchangeably. For example, in dry season, there is a scarcity of vegetation in the Sudan and Sahel Savannah Regions, while there still exist bush grasses in the Benue Valley. Therefore, the nomads avail themselves the opportunity to use these resources. When these grasses are exhausted, migration allows them to regenerate before they come back.

Similarly, the constant change of grazing sites by the nomads has led to a symbolic relationship between them and the sedentary peasant farmers. This study found that 95% of the respondents acquired their grazing sites from the sedentary farmers; and at the same time the agro-pastoral sector of the nomads supplies them in return milk (nono), cheese (manshanu) and manure (taki).

In the light of the above analyses, it seems the disadvantages of migration seem to overshadow the advantages. It is therefore pertinent to settle the nomadic Fulani. But the crucial questions are: Where do we settle them?. When and how? Can Nigeria afford that) This is an area that requires further researches and cost-benefit-analysis.

The major exit and entering points illustrated in Fig. 4.4.3. Could be used as major observation station for trapping the cattle Fulani. For example, these place could be used as immunization and inoculation points. But since some of these places are inter-state boundaries, such programmes should be conducted hand-in-hand with the organs in the neighboring states concerned. Such points could be used as points for assessing the net migration volumes over time.

5.4. The Migratory Trends of the Respondents in the Future

It seems likely that the pastoralist might be forced or induced to reduce their rate of migration in the future due certain factors. We earlier observed that marginal lands like cattle tracks are being brought under cultivation nowadays due to the need to expand the land used for farming which came as a result of recent increase in population and high cost of food items. This development is likely to restrict the movement of the nomads. This is also likely to reduce the distance covered.

This study is also optimistic that even as many nomadic children are acquiring western education, it is envisaged that education, as a weapon for social change will drastically transform the agro-pastoral way of moving from place. With the recent revolution of agriculture in general, it is expected that of the nomads will not remain the automobiles, and horses might be used in the future by the nomads to rear their cattle even as it is done in other developed countries. Hence, the fatigue that occurs from constant movement might not arise. Moreso, the availability of better fodder and feeds will render the need to move useless.

Despite these envisaged changes towards sedentarisation, 37% of the respondents did not show any interest in settling down. Among these laggards are the Bororo'en to indicated that they would continue to migrate because they want freedom. Some of them stated that grazing reserves are not the best for them because they outbreaks of epidemic in such areas have rendered some of them cow-less.

The above findings are consistent with Ezeomah (1987) observation that in view of the large number of nomadic pastoral groups in the country and economic and other ecological constraints militating against permanent settlement and grazing reserve development, pastoral nomadism will continue for some time.

5.5. Testing of Hypothesis II

We analyzed and described the various factors which make the Fulani cattle rearers to migrate from one grazing site to another in table and figure 5.2.1. We also indicated the various push and pull factors operating both at former and present grazing sites. Our analysis reveals that apart from the for pastures and water, there are other push and pull factors of migration. However, these factors are not mutually exclusive. For us to see whether these factors play equal and significant roles in either pushing out and/or null hypothesis (Ho) that:

All the factors which promote migration of the nomadic Fulani (in Jos and Bassa L.G.As)play equal roles.

Alternative Hypothesis (Hi):

All the factors which promote migration of the nomadic Fulani (in Jos and Bassa L.G.As) do not play equal roles.

We shall use Chi-Square test to test the null hypothesis (see Appendix 3).

TABLE 5.2.1
The Various Factors of Migration

Factors	Observed Frequency	Expected Frequency	(O-E)2 E
1. Availability of water	287	360	14.80
2. Availability of pastures	310	360	6.94
3. Absence of cattle diseases	251	360	33.00
4. The onset of the seasons	90	360	202.50
5. Had conflict with sedentary peasants	125	360	153.40
6. Had conflicts with relativ es	39	360	286.33
7. The search for freedom	90	360	202.50
8. Had conflicts with Government Officials	35	360	293.40
9. Loss of cattle	58	360	253.34
10 No reason	13	360	334.47
11 Other factors	139	360	135.67
Total	1437	3960	1916.25

Source: Author's field work, 1988.

Calculated value of x^2 = 1916.25

Degree of freedom = K - 1 = 11 - 1 = 10

χ 0.5 = 18.3 ; χ 0.01 = 23.2

Decision

From our calculation above, we observe that the calculated value 1916.25 is greater than 18.3 and 23.2 We therefore reject our null hypothesis at both 95% and 99% significant levels and conclude that all the factors which promote migration of the nomadic Fulani do not play equal role.

This finding is an indication that some factors are more important than others in promoting amongst the pastoralist. That is, there are some crucial or key factors which really trigger off migration at a particular time and place. Therefore, if we are able to identify and isolate these key factors, it will help us in finding a lasting solution to the problem of nomadism in Nigeria.

PLATES 3 & 4: Some semi-sedentary Fulani women selling prepared cereals milk (Fura-da-nono) at the University of Jos.

PLATE 3

PLATE 4

Babah, a regular supplier of Fura-da-nono to students and staff of the University of Jos. She stays at Babale, Jos L.G.A. and has not moved for quite some years now. She has been culturally influenced by the University environment - unlike her counterparts in plate4.

Source: Author's field work, 1988.

PLATES 5 & 6: A market scene at Zabolo (along Zaria Road) showing some Fulani women selling agricultural products.

PLATE 5.

PLATE 6

Sedentary pastoralism is gradually replacing the nomadic cattle rearing. Some of the cattle rearers in Jos and Bassa L.G.As are becoming less migratory; and have started combining arable farming with cattle rearing. These pictures were taken at Zabolo, showing some-sedentary Fulani women who sell some agricultural products throughout the year. The field crops at the rear also belong to another herder. He used cow dongs (taki) to farm the guinea corn. Source: Author's field work, 1988.

CHAPTER SIX

SUMMARY AND CONCLUSION

6.1. An Overview and Summary of Findings

To the nomadic Fulani, cattle are precious resource. They not only rear but own the bulk of the cattle of Nigeria. Hence, they play aa very important and specialised role in the agricultural sector of Nigeria. The need, therefore, to promote their economy has left them as perpetual wanderers or opportunists who move from place to place,season in season in search of pastures and water for their herds. This constant movement has ultimately constituted planning and management problems specifically because the Fulani cattle rearers are always on the move, thus, organising them to benefit from the current stream of modernization and development has not been easy.

This Pioneer exploratory study, therefore, stems as a result of the fact that what is hither to known about the movement patterns of the nomadic Fulani is rather too general, presumption and lacks specificity. Therefore, a gap exists in the knowledge of the migration characteristics of the nomadic Fulani in the study area which this study sought to abridge. This study however focussed attention on providing accurate and detailed information on the patterns and factors of movement among the cattle pastoralist of Jos and Bassa L.G.As.

From this study, we now know the following facts about the nomadic Fulani of the study area:

1. That about two-third of the households have small households of between 2 - 5 persons.

2. That about more than half of the respondents had between 51-100 cows. This shows that an average Fulani nomad is richer than most average Nigerians, except that he appears haggard, perhaps, due to the fact that he is always moving from one to another-searching for water and pasture for his cattle.

3. That about 80 percent of the respondents were no - indigence of Plateau State. This is an indicator that the acquisition of land for grazing reserves and resettlement schemes might constitute a problem; and could be rather difficult and expensive too. This is because the nomads do not 'own' any land.

4. That more than half of the respondents are illiterates; and that less than one - fifth have acquired some sort of western education. This could be another important factor that accounts for the poor productivity of the cattle in Nigeria. Hence, frantic efforts should be made to educate them, especially the functional system of education that will give them better skills of animal husbandry - thus, improving their productivity.

5. That the decision to change a grazing site could be done overnight, especially during an outbreak of any disease; or having conflicts with the sedentary farmers.

Furthermore, the study has revealed that the frequency of movement of the pastoralist in the future might be less due to varying social, economic and ecological factors. Though, some laggard tribes, especially among the Bororo'en clan will constitute some major problems because of their inherent moving tendencies.

The study has also found that nomads in the study area generally make use of five major routes or directions during movements. Most of the respondents graze their cattle in the southern parts of Kaduna State, some even go as far as the Federal Capital Territory and Niger State. Similarly, a significant proportion graze their cattle in the Benue Valleys during the dry season when vegetation is scarce in the study area. Few others move even as far as Gongola State and the Cameroon. The study also found that the pastoralist who migrate to the southern parts of the country during the dry season usually stay up to 3 - 4 months there. During this period, long distance trekking are involved. The whole household is usually involved in this kind of movement during the dry season. They also leave at the on set of the rains.

The study also found that the movement pattern during the wet season is rather the most problematic from planning perspective. This is because, of the split nature of the movement. The 'push' and 'pull' factors of migration involved were also discussed.

The study also succeeded in indicating, the major entry and exit points of the pastoralist into and out of the study area when they are moving (Fig. 4.4.3). Some of these points are inter-state boundaries; while others are inter-state. Major cattle tracks were also shown on Sections 4.3 and 4.4. More studies should be conducted to find out the intensity of use of these major tracks. The paths with high intensity of usage should be permanently left as cattle tracks. Some of the obstacles to

migration during the seasons were also pin-pointed in Table 4.3.1. These obstacles cause some delays and force the nomads to change their direction of movements. These findings tally with our theory building (1.4.).

The disadvantages of migration were also highlighted; and the need to substitute the nomadic way of life with more or less permanent or sedentary production is also stressed. However, the feasibility of doing this is left to the discretion of further researches coupled with the formulation and execution of resettlement schemes for the nomads of Nigeria by the government.

6.2. Suggested Areas for Further Research

In the light of the findings of this research, the research wishes to make the following observations and recommendations for further study. Much is still to be done in Nigeria to obtain adequate and reliable data on the migration patterns and factors of the nomadic Fulani. Nevertheless, this study was able to identify the various 'push' and 'pull' factors of migration of the nomadic Fulani in Jos and Bassa L.G.As. However, there is need to determine which of these factors really trigger off movement at any instance of migration.

Furthermore, since the heads of the households and Fulani Chiefs (Ardos) play a very important role in the migration processes of the nomads, they should be mobilised and educated in order to help in acquiring data from the nomads so as to reduce the present paucity of data on the agro-pastoral sector. How to mobilise and educate them should also be investigated.

Similar studies of this kind should be conducted in the whole of the Jos Plateau, (which is a distinct physiographic and climatic region in Nigeria) on a larger scale; and accompanied with vigorous statistical calculations so as to compare the findings, and to produce a model that will help policy-makers and planners in establishing resettlement programmes and the allocation of grazing facilities for the nomads.

Furthermore, Conneil (1978) observed that, migration, especially the rural-rural type is a complex process that varies over space and time in its scale, patterns and causes. More studies should therefore be conducted among the various (cattle) pastoralist all over Nigeria on a simultaneous basis and at the same intervals. Such further researches should also focus attention on investigating the changing trends and patterns of migration; and most importantly, on measuring the rates and volumes of migration of the pastoralist.

REFERENCES

Abbott, A.F. (1978) Ordinary Level Physics, Heineman, London.

Adepetu, A.A. (1986) "Settlement Strategies for promoting, the Education of Nomadic Fulani in Nigeria" in Ezeomah, c. (ed). The Education of Nomads in Nigeria - A Fair Deal for Nomads. Proceedings of the 1st. National Workshop on the Education of Nomads, Yola, Nov. 4-6th, 1986.

Adepoju, A. (1984) "Migration Surveys in Nigeria - A Review" in Population Data Assessment in Nigeria. Proceedings of population Association of Nigeria Conference, No. 1, Benin.

Adepoju, A. (1986) " Rural Migration and Development in Nigeria", O.A.U. Press, Ile-Ife, Nigeria.

Ajaegbu, H.I. (1975) "Migration and Rural Economy in Nigeria" in Adepoju, A. (ED): Internal Migration in Nigeria. Proceedings of the seminar on Internal Migration in Nigeria, Univ. of Ife, 1975, pp. 119 - 139.

Ajaegbu, H.I. (ed) (1986) Jos plateau Environmental Resources Development programme. Jos - Durham Linkage, Final Report, University of Jos, University of Durham.

Barth, F. (1961) Nomads of South Persia. Unwin and Allen, London.

Bogue, D. (1959): "Internal Migrations" in Hauser and Dudley (eds): The Study of Population Univ. of Chicago Press, Chicago.

Boneh, D. (1984) "Returning to Pastoralism: Three cases from the Niger bedouin" in Nomadic Peoples No. 15.

Conneil, J. (1978) Migration from Rural Areas. O.U.P. Press, Delhi.

De Jong, G. F. (1981) "Motivation for migration - An Assessment and a value expectancy Research Model", in De Jong and Gardner (eds): Migration Decision Model Pergamon press.

Destcroix, F.W. (1976) The Fulani of Northern Nigeria. Gregg International Publishers Ltd., England.

Devanzo, J. et al. (1981) "Micro-economic Approaches to the Study of Migration Decision" in De Jong, G.F. and Gardner, R.W. Op cit.

Dogo, B. (1986) The Changing pattern of occupation Among the nomadic Fulani of Jaba District in Jema'a L.G.A., Kaduna State, Nigeria. An Unpublished B.Sc. dissertation, Departments of Geography and planning, University of Jos, Nigeria.

Dogo, B. (1988) "Why Nomadic Education Programme Must Succeed" in Sunday New Nigeria, April, 10th, 1988, P> 2.

Emovon, E.U. (1988) Keynote Address by the Honorable Minister for Science and Technology at the 1st National Conference on Pastoralism in Nigeria, held at Kongo Conference Hotel, Zaria, 26 - 29th, June, 1988.

Ezeomah, C. (1982) "Movement and Demography of Fulani Nomads and their Implication for Educational Development", in Ezeomah, C. (ed). The Problems of Educating Nomads in Nigeria. Ishaku Press, Jos.

Ezeomah, C. (1986) "The Problems of Educating Nomads" in Ezeomah, c. op. cit.

Ezeomah, C. (1987a) Settlement patterns of the Nomads Fulani of Northern Nigeria - Implication for Educational Development Deanhouse Ltd., England.

- do - (1987b) "Incorporating Education into Integrated Rural Development Scheme in a Nomadic Fulani Community", in Ezeomah, C. (ed.) International Journal of Nomadic and Minority Education, Vol. 1, No. 2, Deanhouse Ltd., England.

" (1988) Chairman's Opening Address, Seminar Presentations of the UNESCO/UNIJOS Research project on the Education of the Nomadic Families of Bauchi, Plateau and Gongola-State, held at the University of Jos, 23 - 25th August, 1988.

Ekanem, I.I. (1982) The 1963 Nigerian Census - A critical Appraisal. Ethiope Pub. Corp., Benin.

Findley S.E. (1979) Untitled State of the Act Paper on Migration Rural Development Fertility, Submitted to AID.
(1988) First Bank Calendar, M.R.C. Press, Kano.

Fishbern, M. (1978) Beliefs, Attitude, Intention and Behaviour. An Introduction to Theory and Research. Addison-Wesley Pub. and Co., New York.

Fishbern, Mr. M. (1980) Understanding Attitudes and Predicting Social Behaviour. illustration of Applied Social Research. Englewood Cliffs, New Jersey,

Galletti, K.D.S.,et al. (1956) The Nigeria Cocoa Farmer. OUP, London.

Gugler, J. (1968) "on the Theory of Rural - urban Migration", in Jackson, J.A. (ed) Migration. O.U.P., London.

Gulliver, N. (1978) In Gugler, J. and Flanagan, W.G. (ed): Urbanization and Social Changes in West Africa. Cambridge University Press, London.

Green, L. (1974) "Migration, Urbanization and National Development in Nigeria", in Amin, S. (ed): Modern Migrations in West Africa. O.U.P., London.

Hill, I.D. (1974) and Rackham, L.J., The Land Resources of Central Nigeria. Phase 1, Interim Report on the Landform, Soils and Vegetation of the Jos plateau, Vol. 3, The Map Units, Survey, Land Resources Division

Hopen, C.E. (1958) The pastoral Fulbe Family in Gwandu. UIP, London.

Johnson, D.L. (1978) "Changing Patterns of Pastoral Nomadism in North Africa", in Hoyle, B.S. (ed): Spatial Aspects of Development. John Wiley and Sons.

Johnsone, R.J. (1981) A Dictionary of Human Geography. Basil Blackweel Ltd., England.

Lar, M. (1986) An Analytical Case Study of nomadic Education in Plateau State. A ph. d. Unpublished Thesis, Faculty of Education, University of Jos, Nigeria.

Lee, E.S. (1966) "A Theory of Migration in Demography 3, Vol. 3 No. 1, London.

Mabogunje, A. (1970) "Migration Policy and Regional Development in Nigeria", in The Nigerian Journal of \economic and Social Studies, Vol. 12, No. 2.

- do - (1976) "Systems Approach to a theory of Rural-Urban Migration". Geographic Analysis Vol. 2, No. 8.pp.1-6

McCain, J.A. (1979) "Migration patterns in Nigeria: A Multivariate Analysis". African Studies Review, Vol. xv, No. 2.

Mortimore, M. (1978) "Livestock Production" in Oguntoyinbo et al.: A Geography of Nigerian Development. N.G.A., Heineman, Ibadan, pp. 275.

(1988) National Concord, March, 7th, 1988. Lagos.

Okun, G. (1961) and Richardson, B. "Regional Income Inequality and Internal Population Migration", in Economic Development and Cultural Change, Vol. 9, No. 2.

Olsson, G. (1965) "Distance and Human Interaction: A Migration Study" in Geografiska Annaler, Vol. 47, Ser. B., PP 3-43.

Olusanya, P.O. (1969) "Socio-Economic Aspects of Rural-Urban Migration in Western Nigeria", NISER, Ibadan.

- do - (1972) "The inadequacy of Adhoc Demographic Surveys for the measurement of current vital events in Nigeria", in Demographic Statistics in Nigeria, IPMS pubs. University of Ife, Nigeria.

Onazi, O. (1988) keynote address by the Vice-Chancellor of the University of Jos at the seminar presentations of UNESCO/UNDP/UNIJOS Research project on the Education of the Nomadic Families of Bauchi, plateau and Gongola States, held at the Unijos, Jos, 23 - 25th Aug., 1988.

Onokerhorye, A.G. (1985) "Migration" in Population Studies. University of Benin Press, PP. 112.

Prothero, R.M. (1976) "Mobility in North Western Nigeria, Prospective and prospects", in Adepoju, A. (ed) op. cit. (1988) Questionnaire for the National Surveys of the Nomadic Fulani of the 10 Northern States, Nomadic Research Unit, Faculty of Education, Unijos, Jos.

Ranin, G. (1961) " A Theory of Economic Development" American & Fei, J.C.H. Economic Review, Vol. 51, No. 4.

Raveinstein, E.C. (1889) "The Laws of Migration" Journal of the Royal Statistical Society, 52, pp. 186.

Salzman, p.C. (1980) When Nomads Settle: Processes of Sedentarisation and Adaptation and Response. Praeger Press, pp. 10.

Sjaastad, L.A. (1962) "The Cost and Return of Human Migration" Journal of political Economy, Vol. 70, No. 5 part 2.

Stark, O. (1984) "Rural-to-Urban Migration in LDCs. A Relative Deprivation Approach". Economic Development and Cultural Change, Vol. 32, No. 3.

Stenning, D.J. (1959) Savannah Nomads. O.U.P., London.

Stouffer, S.A. (1940) "Intervening Opportunities: A Theory Relating Mobility and Distance", in American Sociological Review, 5, pp. 845 - 867.

Taylor, R.C. (1969) "Migration and Motivation: A Study of Determinants and Types" in jackson, J.A. (ed): Migrations. Cambridge University Press, England.
(1985) The Effects of population Factors on Social and Economic Development of Nigeria. A publication of the Federal Ministry of Health and the national population Bureau, Lagos.
(19880 The Sunday Standard, Feb., 28th, 1988. ppc, Jos.

Todaro, M.P., (1976) Internal Migration in Developing Countries: A Review of Theory, Evidence, methodology and Research Priorities. ILO, Geneva.

Udoh, R.K. (1975) Migrant Tenant Farmers of Nigeria. A Geographical Study of Rural Migration in Nigeria. African University Press, Lagos.

Zaki, T. (1985) An Assessment of pastoral labour Force in Jos and Bassa L.G.As. An M.Sc. Unpublished Thesis, Department of Geography and planning, University of Jos, Jos.

Zipf, G.K. (1946) "The Pip 2/D hypothesis on the Intensity of Movement of persons". American Sociogical Review PB 671 - 688.

APPENDIX 1

THE MIGRATION PATTERNS OF NOMADIC FULANI IN JOS BASSA L.G.As.

QUESTIONNAIRE

A. Background Information

1. Name of Head of Household .....
2. Location of Settlement L.G.A..... Ward (Ardonate).....
   Date: .....

3. Sex of respondent ☐ Male ☐ Female

4. Size of household .....
5. Religion ☐ Islam ☐ Christianity ☐ Paganism

6. Marital Status: ☐ Married ☐ Single ☐ Widow ☐ Divorced

7. Age .....
8. place of Birth L.G.A. ..... Home state .....Clan .....

9. Educational status ☐ No formal education ☐ koranic school (makarantan allo)

   ☐ Adult Literacy ☐ others specify.....
   (Yaki-da-jahilci)

10. Types of animals kept and sizes: Cattle ..... sheep .....
    Goats ..... Poultry ..... others (Specify) .....

B.11. Where were you grazing your livestock before coming to this site? Location (s) ..... L.G.A.....State.....

12. Why did you leave for this area? ☐ Availability of water

    ☐ Availability of pasture ☐ Absence of diseases

    ☐ Onset of season ☐ Had conflict with owners of land

    ☐ Had conflicts with relatives. Others specify .....

13a. Since how long have you been grazing your cattle in this Site? ☐ 1 year ☐ 1-5 years ☐ 6-10 years ☐ 0+ years.

13b. How did you acquire the grazing land? ☐ Government

☐ Neighboring Peasants ☐ Free ☐ Personal

14. How many times have you moved within the past five years?
☐ None ☐ 1-2 ☐ 3-5 ☐ 5+

15. Do you go back to previous camping site? ☐ Yes ☐ No

16. Do you intend to move in the future? ☐ Yes ☐ No

If Yes, to which location (s) ..... LGA.....STATE.....
If Yes, how soon? .....

C. Movement in Dry Season

17. Where do you normally graze your cattle during the dry season ? Location (s) ..... L.G.A..... State .....

18. How long do you normally stay there? .....

19. Since how many years have you been grazing in that area?

20. How often do you change camp site during dry season? ☐ None

☐ once a month ☐ once in two months ☐ once in three

☐ months ☐ depending on circumstances (specify).....

21. How far do you normally move during the dry season? ☐ less

than one day journey ☐ one day journey ☐ more than one day journey

22. Do you move as groups or as an individual family? ☐ as a group

☐ as an individual family ☐ both If as a group,

how many families normally move together? .....

23. Who decides when you should move? ☐ Head of household

☐ Individual ☐ Depending on circumstances (specify).....

24. what are the major obstacle (s) during movement? .....
.....

D. Movement in Wet Season

25. Where do you normally graze your cattle during the wet season? Location (s) ..... L.G.A..... State .....;

26. How long do you normally stay there? .....

27. Since how many years have you been grazing in that area?....

28. How often do you change camp site during the wet season?....

☐ None ☐ Once a month ☐ once in two months ☐ once in three months ☐ Depending on circumstances (specify).....

29. How far do you normally move during the wet season? ☐ Less than one day journey ☐ One day journey ☐ more than one day journey

30. Do you move as groups or as an individual family?.....

☐ As a group ☐ As an individual family ☐ Both

ii If as a group, how many family normally move together?.....

31. Who decides when you should move? ☐ Head of household

☐ Individual ☐ Depending on circumstances (specify).....

32. What are the major obstacles during movement? .....

.....

E. Others: Comments/observations in the field .....

.....

APPENDIX 2

Chi-square is given by the formula:

$$\{ \frac{(Fo - Fe)^2}{Fe}$$

Where Fo is the observed frequency,
Fe is the expected frequency.
{ Stands for the summation
The expected frequency is computed thus:

$$\frac{Tc \times Tr}{Tg}$$

Where Tc is Column total,
Tr is the row total, and
Tg is the grand total

$$\therefore x^2 = \frac{(136 - 68)^2}{68} + \frac{(101 - 50.5)^2}{50.5} + \frac{(116 - 58)^2}{58} + \frac{(61 - 30.5)^2}{30.5} + \frac{(22 - 11)^2}{11} + \frac{(25 - 12.5)^2}{12.5} + \frac{(50 - 25)^2}{25} + \frac{(209 - 104.5)^2}{104.5}$$

$$= 68 + 50.5 + 58 + 30.5 + 11 + 12.5 + 25 + 104.5 = 360$$

{ 0.05 = 14.1 ; { 0.01 = 18.5 at Degree of Freedom= k-1 =8 - 1 = 7.

Decision

We reject Ho at both 95% and 99% confidence limit and accept Hi.

APPENDIX 3

$$X^2 = \frac{(Fo - Fe)^2}{Fe}$$

Where X^2 = Chi-square
Fo = Expected Frequency
Fe = Observed Frequency

	Factor	Observed Responses (Frequency)	Expected Responses (Frequency)
1.	Availability of water	287	360
2.	Availability of pastures	310	360
3.	Absence of cattle diseases	291	360
4.	The onset of the seasons	90	360
5.	Had conflicts with sedentary cultivators	125	360
6.	Had conflicts with relatives	39	360
7.	The search for freedom	90	360
8.	Had conflicts with Govt. officials	35	360
9.	Loss of Cattle	58	360
10.	No reason	13	360
11.	Other factors	139	360
		1437	3960

$$X^2 = \frac{(287-360)^2}{360} + \frac{(310-360)^2}{360} + \frac{(251-360)^2}{360} + \frac{(90-360)^2}{360} + \frac{(125-360)^2}{360}$$

$$\frac{(39-360)^2}{360} + \frac{(90-360)^2}{360} + \frac{(35-360)^2}{360} + \frac{(58-360)^2}{360} + \frac{(13-360)^2}{360} +$$

$$\frac{(139-360)^2}{360}$$

= 14.80 + 6.94 + 33 + 202.5 153.40 + 286.23 + 202.50 + 293.40 + 253.34 + 334.47 + 135.67 = 1916.25

Degree of Freedom = k - 1 = 11 - 1 = 10.

χ 0.05 = 18.3 ; χ 0.01 = 23.2

Decision

Since the calculated value 1916.25 is greater than the theoretical values of 18.3 and 23.2, we reject the null hypothesis at both 95% and 99% confidence limit and accept the research hypothesis.