THE SPONTANEOUS FACTOR IN RURAL CHANGE: THE CASE OF YAM PRODUCTION AND MARKETING IN THE ZARIA AREA OF KADUNA STATE, NIGERIA

BY

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A thesis submitted to the Postgraduate school
Ahmadu Bello University, in partial fulfillment
of the requirements for the degree of Master of Arts

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March, 1985

DECLARATION

I hereby declare that this thesis has been written by me and that it is a record of my own research work. It has not been presented in any previous application for a higher degree. All quotations are indicated and the sources of information are acknowledged by means of references.

E.O. Effeh

24th April, 1985
Date

ACKNOWLEDGEMENTS

The contributions which went into the making of this project were as varied as the people who kindly made them. They were made at various stages of the project and I feel deeply indebted to them.

Alhaji Sule Gazara, Divisional Produce Officer, Zaria Area, did not only provided useful data from his office he also procured data from the offices of the Cotton and Groundnut Boards in Zaria and gave me useful information about the marketing of crops which are handled by his office. Alhaji Mohammed Kyari, Production Director and Factory Manager, Nigeria Tobacco Company, Zaria kindly gave me access to his wealth of experience as a successful yam farmer in Bomo village. Mallam Kankia was the Assistant General Manager of the Nigerian Cotton Board, Funtua when the field interview was conducted. Formerly he was operations Manager of the Funtua Agricultural Project. I wish to acknowledge the value of the information which he gave me and which was based on his rich experience.

My gratitude goes to the Secretary to the Government and Head of Service, Governor's Office, Kaduna State for granting me permission to conduct the field survey in the study area. Grateful too for the

cooperation I received from the village heads during the period. I gained much from the assistance of Alhaji Musa, village head of Igabi, who went with me to the farms on a number of occasions during the field operations.

I am deeply indebted to my Supervisor, Dr. J.M. Baba, Department of Geography, Ahmadu Bello University, Zaria. His supervision of this work was expressed in much guidance, help and stimulation. His concern for the completion of the work was shown in various ways including the period when he was taken ill. His administrative advice and support as the co-ordinator of the post-graduate studies is also gratefully acknowledged. Professor K. Ologe, Head of Department of Geography, has shown particular interest in the progress and completion of this work. He has also borne several inconveniences over the disbursement of the grant for this project.

I have also benefitted from the support and encouragement of Dr. J. Gana, the advise and comments of Dr. Hyde and the cooperation of all staff of the department including Dr. Ogbona. The contributions of the technical staff especially Mr. Bob Williams is also thankfully acknowledged.

I am also thankful for assistance from staff from other departments of Ahmadu Bello University. The assistance of Dr. K. Brown, Sociology Department in statistical matters was immense. The help I received from Dr. I. J. Ibanga, Head of Soil Science Department, I.A.R. and that of his staff gave me access to the use of the air photographs covering Igabi area. Dr. C. O. Ikediobi of the Department of Biochemistry, Ahmadu Bello University, Zaria was also helpful in providing information on the preservation of yam tubers.

My grateful appreciation also goes to the University Board of Research, Ahmadu Bello University, Zaria for the research grant which provided the financial support for the conduct of this research.

The support and sponsorship of the Director, Institute of Education, Ahmadu Bello University, Zaria is gratefully acknowledged. I am also appreciative of the supports and good wishes which have strengthened me at various stages of the project. In this respect, I deeply acknowledge the contributions of Mr. F. Bamijoko, Head of Teacher Education Division, Dr. K. Oladipupo, TISEP Co-ordinator, Dr. C. S. S. Bello Institute of Health, A.B.U. Zaria, Mr. O. K. Awesu, Institute of Education, A.B.U. Zaria and a host of friends too many for mentioning within this limited space.

The understanding of my wife and family during the pressing moments of the final stage of this work is also acknowledged.

To everyone belongs the credit that may be due this work while its flaws are wholly and solely, the result of the weakness of the author.

ABSTRACT

Specific examples from many third world countries, including Nigeria, point to a general case in which agricultural production of rural societies tends to increase under rising prices and contract under falling prices. In the case of the Zaria rural area, however, the study shows that the forces behind increased yam production in the area are (1) the efficiency of the marketing system and (2) the relative profits which the farmer earns from the cultivation and marketing of yam vis-a-vis cotton and groundnuts which are the two other commercial crops in the area.

The study shows that the process of yam cultivation passed through three evolutionary stages in the study area. The first was the preliminary stage when yam cultivation was in its infancy. The second was the pre-commercial stage when yam cultivation developed only gradually. The third and final stage, the commercial stage set in about the end of the Nigerian Civil War when there seemed to have been an increase in the tempo of growth in many Nigerian towns including Zaria. The final stage was characterised by a marked increase in yam cultivation.

The study traces the physical and human resources which have made the yam evolution possible. It suggests that a close relationship exists between the yam evolution and growth in urban Zaria.

An assessment of the dynamics of Zaria urban growth indicates that this urban centre will continue to be a viable market although the demands of other urban markets also exist for the Zaria yams. In response to the market opportunities, the Zaria rural societies have expanded the process of yam production which has in turn raised the demand for farm labour in the study area.

The study notes that the new labour demand situation led to longer hours of family labour in farms as well as to the emergence of paid migrant labour in the area. Other changes both institutional and structural have also emerged under the influence of the evolution. Some of the changes include increased number of personal assets which represent physical signs of the material well being of the rural societies and evidence of the transformation in rural Zaria. However, the project further notes that since these personal assets lack basic infra-structure, rural responsiveness is not sufficient to take care of rural development. Never theless, it sees the spontaneous responsiveness as being necessary in revealing local resources on which effective plan for rural change may be based.

The study also considered the problems of the rural areas and noted, among other things, that the absence of basic infrastructure and essential services has inhibited the production process in the research area. On the basis of the foregoing inadequacies and in the light of the finding of the present study, the study recommends a rural development plan which relates to the production

pattern of the rural producer. Such a plan would emphasises the installation of rural infrastructure and the establishment of institutions to step up the product capabilities of the rural areas and improve the standard of life of rural societies in Nigeria,

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CHAPTER ONE

INTRODUCTION

1.1 Nature of the Problem

The nature of the problem centres around the spontaneous change in the pattern of agricultural production of rural communities in Nigeria. The process of change, in itself an expression of the farmer's response to market stimuli, is seen as lending support to the stated aims and objectives of this research.

The concept of change in the production process of rural communities in response to market stimuli has a major implication for Nigeria and other developing countries. Such implications relate directly to the food problems in these countries as growing population failed to witness equal increase in food production (F.A.O., 1967). For instance, the growth rate of the population of

Nigeria is estimated to be 3% per annum, whereas the rate of food production is estimated at 2% per annum, (Arnold, 1977). The outcome is an average daily food intake of only 2,000 calories per head which amounts to gross underfeeding (Oluwasammi, 1971; Baba, 1981). While the inequalities between the rate of population growth and food production have led to food deficit, rising bills on imported foddstuffs have become the inevitable concomitants, (Oluwasanmi, op. cit.; Forrest, 1977; Mortimore, 1978; Wallace, 1979; Hocking and Thomson 1979). The foregoing is the situation inspite of efforts to raise agriculture from its seeming slumber and increase its production level.

These efforts include the setting up of institutions for agricultural development like the Agricultural Credit Bank, eleven River Basin Authorities, World Bank Agricultural Projects, Nigerian Agriculture and Co-operative Bank, National Grains Board, National Roots Board and Federal

Agricultural Support Unit. Another is institutional reforms directed towards creating a conducive atmosphere for stepping up food production. Among these are the Land Use Decree of 1978, the Operation Feed the Nation (O.F.N.) in 1975 and its successor, the Green Revolution in 1980 (Baba, 1981). Although Baba admits that the full assessment of most of the specific programmes is yet to be accomplished, he expresses the view that:

> It can be said at this stage that within the details of these same programmes lie the plight of the agricultural community. Rather than break down existing barriers between the farmer and the means of production, some of these programmes have erected more. Rather than ensuring the farmer's maximum reward for efforts made, many programmes have left the farmer worse off (Ibid. p. 5).

It is, therefore, a matter of concern that while the search for the answer to Nigeria's persistent food problem continues, policy makers and planners in Nigeria have remained largely oblivious of the potential effects of new market opportunities on the agricultural pattern of rural producers. Such effects represent, essentially, the responses of farmers in the mode of production to the functions of the market and commodity price mechanism.

1.2 Market-Price Mechanisms and Producers' Response

Mellor (1966) has observed that the relative level of agricultural prices influences the allocation of production resources and hence the level and pattern of agricultural production. This is because price relationships affect relative profitability and the responsiveness of the farmer, assuming that his attitude to changes in profitability is positive. Mellor (Ibid.) further noted that relative profitability is a determinant of the physical productivity of resources in various uses (including human) as well as relationships among prices of inputs and outputs; which implies according to Baba (1981) that the incentive to produce any commodity may be raised by increasing the physical productivity of input; and by raising the prices of products relative to inputs. Such high prices may either come from government support or from the demand situation of efficient marketing system.

Price mechanisms, therefore, become critical tools for regulating agricultural production. In general, however, the tendencies are the expansion of production under conditions of high and stable prices and efficient marketing systems; and contraction of production under low or unstable price and inefficient marketing systems. Specific examples outside and within Nigeria abound and may be readily recalled.

According to the report of the F.A.O. (1967), high prices and efficient marketing system in Brazil helped to double wheat production between 1950 and 1955; while price supports were instrumental to the rapid expansion in wheat and maize production in Mexico. The report further noted that when it became necessary to reduce surplus production of both crops, Mexico lowered the prices of both products in 1966. Experiences with rice in Sri Lanka and Taiwan, and with sugar in Lebanon are generally similar to the above (op. cit.). Coming nearer home, tree crops like coffee and cocoa also showed striking increases in production in response to higher market prices in the early 1950s (F.A.O., 1967; Helleiner, 1966; Hill, 1970). Tiffen (1971) noted increases in the production of groundnuts in Gombe area of Nigeria when prices were high in the mid 1930s and a drop in export of the same crop when export prices were kept low in 1939-40. The low prices were on account of the price stabilization policy of the Marketing Board. As with the cases of wheat and maize in Mexico, the spontaneous process adopted by the Gombe rural producer showed a positive response to high price incentives and negative response to the disincentives brought about by low prices. Hogendorn (1970) reported an interestingly dramatic switch from cotton

production to that of groundnut in Kano area about 1912. The spontaneous switch in Kano arose from the effect of higher relative prices for groundnut and the phenomenon according to Hogendorn, "significantly altered cropping patterns, lines of commerce and standard of living" (Ibid., P.30) of the affected rural population group.

However, the observation is made that among rural communities where the bulk of farm production is consumed as staples by the producers, high prices may not lead to increased farm production. This is because a fall in price may cause increased sale as farmers try to compensate for lower prices through larger sales at the expense of their own consumption(F.A.O., op.cit., Myrdal, 1970). This situation according to Myrdal tantamounts to hunger sales. Conversely, the argument is advanced that increased prices may result in reduced sales as farmers need to sell less to obtain the cash needed for essential expenditures.

In answer to the above, it is to be noted that the observation is concerned with the marketed quantity rather than gross farm production. It is further advanced that the "hunger sales" would apply only to farmers for whom the amount of food retained in any normal year is not adequate to meet their needs.

Better-off farmers who could satisfy their needs for food and accumulate savings, would not react in this way, (F.A.O., op. cit., p. 8). Farmers who produce commercial crops and who also produce other crops for food need not be subjected to hunger sales either. Thus farmers who produce primarily for the market are likely to expand their agricultural production under the incentives of high prices and efficient marketing system as earlier examples show.

Such responsiveness is expected whether or not the market is external in origin, but an expanding home market, according to Tiffen (1971), offers the farmer two important economic benefits. It gives the farmer some protection against unfavourable internal price movement or against low monopoly prices such as those offered for commercial/export crops by Marketing Boards or Special Buying Agents. Secondly, the large home market gives the farmer several alternative production possibilities for changing production from a less profitable to a more profitable line of production. This enables the farmer to maintain or increase his income during price changes. This flexibility is possible because the rural producer/trader knows more about changes in the home market conditions of which he is a part, than he does about trends in international

markets. Commenting on the participation of farmers in rural Hausa markets, Scott (n.d.) noted that with expanding commercialisation of food crops in Northern Nigeria, the internal organisational structure of rural produce markets changed. That the change involved increasing participation of farmers in aspects of markets formerly held by traders, 'dillalàci' (middlemen) and other full-time market participants.

The desirability of a large home market then turns the attention of this thesis to a consideration of the size of the Nigerian market as measured by its population. The aim is to assess the capability of the market to generate cash income for rural agricultural production.

1.3 Nigeria: Population and Size

The first complete census of Nigeria which was conducted in 1952 placed the country's population at 30.4 million. In 1963, the figure had risen to 55.7 million giving an intercensal increase of 83.2% (United Nations, 1968; Yesufu, 1968). The estimated figure for 1973 was 59,607,000 (Gendreau, 1977). Projecting the population figure from 1973 and using

3.2% as the annual rate of increase Brown (1984) arrived at a population figure of 81,676,000 in 1983 for Nigeria.

With the land area of 923,768 km^2 the country's size is about three times that of the rest of Anglophone West Africa, and contains almost 60% of the total population of West Africa and about 16% of that of Africa as a whole. Thus within a significantly massive land area, the size of the population and its rapid growth rate have combined to make Nigeria the most populous on the African continent and can be seen to represent a vast market.

The issue has been raised that rapid population growth has its attendant setbacks on a nation's economy and general state of development (Caldwell, 1975). Among these are two specific setbacks.

One is that the provision of duplicated facilities for the increase in population (extra housing, schools, hospitals, roads) uses up savings which could otherwise be used for increasing the capital investment per worker so raising productivity.

The second is that fast-growing population is characterised by an age structure which contains a relatively small proportion of persons in the main occupational age span (15 - 64 years of age) and a high proportion of dependent population (mostly children who either do not work or do so less efficiently relative to their consumption needs). Therefore the same per capita earnings as in a more slowly growing population mean lower per capita consumption (and lower per capita savings).

In reply, it may be contended that although the growth of the population of Nigeria is relatively fast, it cannot be claimed that the above problems are applicable to the country. After the depopulation effect of slave trade of the 1800s Nigeria, like other African countries, needs its own manpower to develop the resources within its territory. It also needs a viable internal market to induce changes in its production systems, both industrial and agricultural. Besides, in the absence of a defined population size which yields the highest G.N.P. (Gross National Product: annual total value of good produced and services provided)

the issue of rapid population growth for Nigeria may reduce to begging the question. Moreover, there is the important fact that population in Nigeria is anything but evenly distributed so that while vast territories are almost uninhabited some districts are densely settled (Udo, 1975, 1983; Hance, 1975; Grove, 1961; Goddard, Mortimore and Norman, 1975; Gleave and White, 1968; Mortimore and Wilson, 1965). Agreeing to the problem caused by a dearth of appropriate measurement, Caldwell (1975) admits that "surprisingly little good research and adequate measurement has been applied to such problems (of rapid population growth) in West Africa" (Ibid., p. 5).

In terms of its market, the size of the population of Nigeria means much for rural investment and production. Yet another dimension which accentuates the effectiveness of the market is the growth of urban population which has been phenomenal since the middle of the present century. This has been noted by the World Bank Report (1982) which

stated that while urban population constituted about 13% of Nigeria's total population in 1960, the share had risen to about 20% in 1980. Udo (1975) has attributed the urban growth phenomenon to migration. Reviewing the direction of flow he observed that:

> In broad terms, the direction of flow of migrants was mainly south to north and the migrants consisted largely of southern Nigerians going to the developing northern cities of Maiduguri, Yola, Jos and Zaria. A small proportion of these migrants settled to work in the tin fields of Plateau Province but by far the greater majority went to urban centres. This was before the 30 months civil war which ended in January 1970; but the indications are that there will be a resumption of this flow in the post-war period(Ibid., P.299).

At this stage, a brief appraisal of the total national population figures is probably appropriate. The conduct of national censuses in Nigeria has always been fraught with problems which stand in the way of accurate figures. The political implications which the census has in Nigeria seemed to have contributed to the difficulties of arriving at an accurate national census which enjoys public acceptance and respect. Udo (1983) highlights the nature of the problem when he observes that:

> Since independence, each state has come to attach great importance to the size of its population largely because revenue allocation and representation in the National Assembly are based on the number of people resident in each state. This consideration has contributed considerably to the falsification of census figures since the 1962 census; and is likely to create similar problems for any future census (Ibid.,P.2).

Contributing to the debate on Nigeria's census problem, Yesufu (1968) notes that the federal character of the constitution, as well as the fact that political parties draw support largely from a single region are such that any shift in population distribution can have important consequencies for interregional balance of power. Thus alleged falsification of figures in respect of the 1962 census, for example, sparked so much dispute and controversy so that it was nullified and another conducted in 1963 (Ibid.). But even the 1963 census, according to Yesufu, was not entirely free from absurdities when compared with the 1952 census.

Besides, population figures derived from estimates rely heavily on records of determinants like births, deaths, employment and tax returns. Needless to point out that such figures are not always reliable. This is due to the fact that not all births and not all deaths within a district may get into official records. Not all the names of tax payers may be

written in the official tax list (Tiffen, 1971). Due to the foregoing reasons, the population figures in question may not be accepted without caution; but inspite of these limitations, the figures are useful indicators of the general upward trend of population movement in Nigeria.

Thus the relatively broad base of the Nigerian population with an annual rate of growth exceeding 3% (Brown, 1984), together with an even higher rate of urban agglomeration is likely to constitute an assured market for rural agricultural products for now and in the foreseable future. Growth of towns plays a very significant part in the market formation process. This is because as Udo (1975, p. 304) observed, "It is in the city, where great numbers of people are concentrated that a market exists for the products of certain manufacturing industries", and it may be added, agricultural products.

Stepping up the demand of the urban market is the high proportion of the elite group resident in towns. Ajaegbu (1976) defined the elite population as:

> Those people who have moved up the social and economic ladder, achieving a position in the society as well as a combination of traits at a given level which are above and distinct from, those of the mass of the people. They possess at least a minimum (or a given) level of the following financial and other material acquisition (wealth); standard of living; a level of knowledge, information or awareness; and a range of perception (Ibid., p. 27).

It would then appear that a handsome percentage of the urban population gained entry into the elite group through teaching jobs in post primary and higher institutions of learning; placements in the public services, parastatals, commerce and industries, the Armed Forces and several sectors of the economy. The effective demand of this group is backed by its income earnings.

These modern dimensions of change (increased national population, growth in urban population, rise of elite group with a high purchasing power) have led to the expansion of the market and to rising demand for food products. The implication of this growth is that it seriously calls for rapid food production to sustain the vast market whose rising demand for foodstuffs is reflected in rising agricultural prices. The next logical question is: what is the possible effect of the high prices or price changes on the pattern of production of the rural farmer?

It was seen earlier (page 4) that the incentive to expand production may be raised by increasing the physical productivity of inputs, and by raising prices of products relative to inputs. Changes may, therefore, be expected in the production system of the rural farmer in response to high prices. High prices arising from efficient marketing system and market forces become the external stimuli which make the rural communities ready to change their mode of production. This spontaneous response to price changes under efficient marketing system by rural communities lends support to the aims and objectives of this project. The objectives which include that of finding ways of using farmers' responses to stimulate developmental changes in the rural area are stated specifically below.

1.4 Specific Objectives

These focus on changes in the pattern of rural production in Igabi District of Kaduna State and are presented in four distinct parts.

1. To account for the evolution of yam production in the Zaria area in the last two decades.
2. To describe the impact of the evolution on (other) traditional cash crops.

3. To analyse the impact of yam production on rural labour organisation.

4. To examine ways by which the responsiveness of the farmer can be used for the planning of rural development.

1.5 Operational Hypotheses

Central within the context of the stated objectives are the following hypotheses.

1.. That the expansion of yam production in Igabi District within the last two decades is a function of the spontaneous response of the farmer to changing market opportunities.

2. That the expansion of yam cultivation in the study area is due to the decline in traditional export crops.

1.6 Methodology

Under this section the thesis addresses itself first to the specification of data requirement before attending to the data sources and methodology.

Four main sources of data were used in the research. These were documentary and historical evidence including aerial photographs, field measurement, oral interviews with leading people and questionnaire survey.

In a study of this nature, a series of aerial photographs were considered vital in showing changes in the relationship between terrain factors and the dynamics of landuse. Consequently, two runs of aerial photographs, 1965 and 1972, covering the study area were required and used in the study.

Documentary evidence on Zaria area included archival materials from the Nigerian National Archives, Kaduna. The Zaria Provincial Annual Reports which were available from the Archives gave useful historical information on farming as far back as the late 1930s. Documents in Arewa House, Kaduna were of value not only in matters relating to farming in the area, but also on urban Zaria. Sources of special reports were ample. Statistics from the headquarters of the Cotton Board, Funtua; those from the headquarters of the Groundnut Board, Kano; were useful in giving the general trend of production or sales of respective crop, albeit on a national scale. The documents of the Cotton and Agricultural Processors, formerly British Cotton Growers' Association, Zaria served a similar purpose but in respect of the quantity of cotton handled between 1960 and 1982.

Other documentary sources of evidence were used: statistics of the Ministry of Agriculture; statistics of the Produce Inspection Division, Ministry of Agriculture, Kaduna State and statistics of Kaduna State Integrated Rural Development Project, Maigana. Kaduna State or North Central State Statistical Yearbooks of the Ministry of Economic Planning and Rural Development, Kaduna, provided statistics on Marketing Board purchases of crops. They also contained data on acreage and output of principal crops on Zaria Provincial basis including crops which occupy central places in the project.

Field measurements were conducted in two phases. The one was for purposes of delimiting the unit of measurement for yams together with determining the average weight of the unit. It was also concerned with the determination of price changes in time and space. The actual measurement of yam plots was designed to establish two very important antecedents namely, the average size of yam plots and the average holding size. A careful study of the prices of inputs used in the production of yams and related crops was also conducted.

Oral interviews with leading and experienced persons in related fields proved very informative. Interviews were conducted with village heads and or their counsellors. District head, managerial staff of the Cotton and Agricultural Processors, Zaria; the Chief Technical Officer of the Kaduna State Integrated Rural Development Project, Maigana, whose area of operations covers the study area was of much assistance. He provided a comparative cost analysis of the production expenditure and revenue per acre of each of the three crops dealt with in the project. The assistance given by the staff of the Soil Survey Department of Ahmadu Bello University was immense. Following a recent soil survey of part of the area by staff of the department very useful information on the soil resources was made available for use in this project. Some aerial photos were also kindly provided by the department.

Finally four sets of questionnaires were prepared and administered. The questionnaire which was distributed among farmers was to collect information on the production and exchange of yams. It was distributed during the months of July and August,

1980 and it numbered 393 (Appendix I). Another questionnaire was designed for farm workers. It was administered in June, 1980 to collect information on the pattern of movement and organisation of labour which have emerged under the impact of the yam enterprise (Appendix II). The third questionnaire was for middlemen (Appendix III). To some degree, information from one set was used to assess the validity of information provided by the other. The last questionnaire (Appendix IV) focused on urban Zaria. It was administered among government establishments and limited liability companies and public corporations. It was hoped that by the exercise, the dynamics of urban growth would be known and the possible impact on the dynamics of land-use in rural Zaria assessed, as the two processes are often inter-related.

1.7 Sampling Procedure

The population figure of the centres as contained in the 1963 national census was used as reference. According to the census, the total population figures of the centres were Dunki (1014), Fara Kwai (2508) and Igabi (5495). According to Norman (1972) the average

size of household in some villages in Zaria area is eight. This figure was in conformity with an earlier FAO (1966) report and was used therefore, as a tentative basis for determining the population for the centres. When the total population of each settlement was divided by eight, the respective quotients were: Dunki 127; Fara Kwai 314; and Igabi 687. The ratio 1:3:7 derived from the quotients above was used to determine the sample population of each centre out of a total size of 500. The choice of a sample of 500 for all three centres was dictated by the prevailing financial constraints and the need for an acceptable level of representativeness. And on the basis of the above ratio, the centres were assigned as follows: Dunki (46), Fara Kwai (136) and Igabi (318). Although the actual number of questionnaires allotted to each centre was over and above the assigned shares, the number of returned questionnaires were fewer than the assigned shares. Of those returned only the following numbers were correctly filled and therefore found acceptable for analysis; Dunki (46), Fara Kwai (106) and Igabi (241). But even at this level, the degree of representativeness was considered adequate being 36% for Dunki, 34% for Fara Kwai and 35% for Igabi.

The foregoing procedure applied to the 393 questionnaires designed for farmers, most, if not all of whom were residents on a more or less permanent basis (by being natives of the area). The procedure did not apply to the questionnaire of the hired labour survey. This was because respondents were not necessarily natives or long term residents of the area. Consequently, enough questionnaires were produced and the respondents were interviewed directly on the farms. 443 farm workers were interviewed, 292 in Igabi; 120 in Fara Kwai and 31 in Dunki. The questionnaire designed for middlemen was distributed among them mainly in the local market centres. 89, 27 and 28 of them were interviewed in Igabi, Fara Kwai and Dunki respectively. Of the questionnaires which were distributed in urban Zaria, the number returned which were of value for analyses numbered 26 questionnaires.

1.8 Tools of Analysis

Quantitative techniques were used to describe the character, distribution and the relationship between variables. The product moment correlation coefficient was useful in the measurement of the relationship between sets of variables. This tool provided the numerical index which showed the degree of relationship in question. Bar graphs were used where necessary to show relative distribution among variables.

Partial correlation analysis was used to compute a linear combination of independent variables to determine those which correlate more strongly with yam, the dependent variable.

1.9 Limitations of Methodology

There is need to point out the limitations which arise from the methodology. First, no pre-testing of the questionnaires was done. However, the briefing of interviewers who knew the local Hausa language and the culture of the people did much to ensure that a high

standard was reached in the administration of questionnaires. The briefing also stressed the need for interviewers to cross-check the effect of memory lapse on the part of respondents when giving information about events in the past. Other limitations are noted where they arise during the course of writing this thesis.

1.10 Significance of the Study

The growth in Nigeria's population, coupled with the trends in urban growth and expansion, strongly calls for agricultural expansion to sustain the population. The responsiveness of farmers to change under the inducement of price changes and market opportunities was alluded to earlier in the chapter. The idea of change seems to be made manifest in the pattern of agricultural production of the rural producer. This project attempts an investigation of the pattern of change in the rural economy and the extent to which the said responsiveness can be used in the planning of change in rural development.

The rationale of the approach may be explained in the words of Tiffen (1971) who observed that

"development depends substantially on the reaction of individuals to new opportunities, both those created as a result of government planning and those occurring as a result of unplanned changes in demand and price". Such individual reactions stand to be useful in a plan to step up the productive capabilities of the study area particularly, and the rural area generally.

Besides, since "best national statistics relate to export crops" or crops purchased for industrial use, a project of this nature which studies the action of people in a local setting helps to show the importance of the largely unrecorded home market demands and price movement of food crops. Moreover, the cummulative effect of rural growth poles can very often only be analysed through a close study of an area which is of a manageable size like the Zaria area. The evolutionary pace of change in the growth pole may then be revealed. Otherwise, the rapid change in the "pole" tends to be obscured by the national average figure which gives the picture of comparatively slow growth.

Thus the present study was based on three

The choice of the villages was influenced by their contrasting locational situations and varying population sizes (chap. 3). From the study, therefore, should emerge valuable information for planned developments in rural economies.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This literature review may be divided into two broad sets. The first is general in character and deals with the theories of agricultural change. Evidence for two dominant models of spontaneous agricultural change are reviewed. These are the models of responses to population pressure and urban industrial growth. These two will suffice to provide the necessary foundation on which this study must stand since it is neither possible nor desirable to plough through the whole range of theories that have been advanced in the vast field of agricultural change.

The second set of literatures are those which are set against the Nigerian background including the Zaria area. This latter part should supply the needed spadework and information about the study area. The exercise begins with theories of agricultural change.

2.2 Theories of Agricultural Change

2.2.1 Population Pressure Model

Esther Boserup's (1965) work provides a most appropriate starting point in this analysis. Using data from South-East Asia, she hypothesised that

profound changes occur in primitive communities and that these changes are brought about by forces emerging within the communities themselves. To her, the main internal force which stimulates agricultural change and development is the pressure of population growth.

From a less intensive practice, the process of change advances to more and more intensive cultivation methods. She then identified successive stages of development, each stage incorporating a higher level of farming technique than the previous stage, the prevailing level of technology at each stage being explained in terms of the differences in population density. Under the influence of increasing population growth, therefore, shifting cultivation would advance into intensive cropping system through long term bush fallow, short fallow and annual cropping practice. Similarly, natural nomadic grazing would be replaced by fodder cropping while dry upland farming would give place to irrigation system.

Boserup concludes that technical, economic educational and social development are functions of rising population densities and that "primitive communities with sustained population growth have

a better chance to get into a process of genuine economic development than primitive communities with stagnant or declining population" (Ibid.,p. 118)

Boserup's theory enjoys the backing of Gleave et al. (1968) who attempted to establish a relationship between two correlates: agricultural system in West Africa and population densities. Three farming systems are recognised by these authors namely shifting cultivation; rotational bush fallowing, quasi-permanent and permanent cultivation. With reference to various parts of West Africa, these authors listed evidence which suggests that a connection exists between population density and agricultural practice and that the practice becomes modified as density changes. They claimed that shifting cultivation is found only where population densities are low, usually below about 10 persons per km^2. That, in general, rotational bush fallowing is practised where population densities are higher. But increasing population density eventually reduces the length of the fallow periods until the cultivation practice becomes semi-permanent or permanent. These farming systems are claimed to be in consonance with Boserup's successive stages of agricultural evolution and changes.

Another justification of Boserup's treatise is that based on the indigenous agriculture of the Kara people who inhabit the Ukara Island of Lake Victoria. This case was brought to light by the work of van de Walle (1972). The author shows that high population density prevails on the island, reaching an average level of 384 persons per square km. While very intensive farming methods were known to have been in practice among the islanders since the pre-colonial distant past, their counterparts who migrated to the less peopled mainland have, more often than not, given up their intensive cultivation methods.

Also relevant in the context of population density and agricultural systems is the work of Grove (1961). He notes that almost everywhere in Northern Nigeria, population density correlates positively with intensity of agricultural systems in Kano, Katsina, Zaria and Borno areas and finds them to relate to population density and size. He identified different levels of landuse practice ranging from extensive system in the thinly peopled South-west Borno with about 10 persons per square kilometre to intensive system in the close settled zone of Kano with population

densities exceeding 154 to the square kilometre. An extension of intensive landuse in Kano involving the use of well water has been observed by Mortimore (1978), who remarks that about 12 hectares of land are irrigated from well water in Warure area within the city call. This indigenous initiative Mortimore sees as falling within the limit of small scale indigenous technology .

In the cases just discussed above, Boserup's hypothesis is justified. Greater numbers of people both require and allow agricultural systems to be more intensive (Grove, 1961). The change in landuse practice to increase agricultural production has been in the main, a spontaneous response to increased market demand as measured by higher population density.

However, much as Boserup's hypothesis deserves accreditation, van de Walle (op. cit.) spotlights what he considers a weakness in it. It is that her thesis presupposed an unlimited dynamism in the ability of traditional communities to intensify agriculture under demographic pressure. On the one hand, his (de Walle's) work on the Kara islanders seems to weaken such assumption since in the case in question out-migration to the mainland appeared to

have provided the answer to the population pressure on the Ukara island. Even so, the present writer is of the view that the availability of land on the mainland could have served as an escape route which prevented the pressure of population from rising up to a stage high enough to trigger a technological innovation in food production on the Island. Van de Walle (1968) expresses a similar view elsewhere although in connection with the alleviation of population pressure by temporary migration. Referring to this type of migration he observes that; "it has afforded a breathing spell for subsistence agriculture to avoid evolution, and appears to have affected productivity in perverse ways" (Ibid., p. 364).

It would appear that only in a completely isolated situation such as Robinson Crusoe's Island, can one expect a population pressure high enough to cause technological evolution. This is because where alternatives abound within the same geographical or national area, it will be irrational to expect traditional communes not to migrate in response to available means of livelihood elsewhere in the form of available land for cultivation or even job opportunities.

Such was the underlying factor in the Ukara Island migration. Similar but temporary migrations have been observed by Udo (1975) for the Awka/Orlu area and Sokoto province of Nigeria. Goddard et al. (1959) have seen the widespread seasonal migration from the Sokoto area as a phenomenon in response to the poverty of the agricultural sector.

Clearly the seasonal migration here cannot be blamed solely on poor soil factor. A significant explanation can be found in the seasonal character of agricultural practice which has an after farm break when farmers must await the onset of the next seasonal rains to commence farm work. During such period, farmers migrate to other areas including urban areas for jobs (Udo, 1975). Afterall, the same author observed the existence of the probability that many migrant farmers from the densely settled area of Sokoto will be locally absorbed in the Zamfara valley which has a vast potentiality for development as food crop region (Ibid.).

Nevertheless, to assume an indefinite capability of traditional communities to intensify agriculture under population pressure might mean expecting too

much even in an isolated state. Even among the advanced communities of Europe, for instance, this does not seem to be the case. Boserup (1965) has argued that the transition from short fallow to annual cropping in Europe was not the result of autonomous inventions, since the new methods were nearly all known before, but of the extension of intensive methods from gardens to field (Ibid., p. 38). This view has been borne out by Hutchinson (1966) who argued that manure was more significant to the "New Husbandry" in England than the inventions to which the agricultural revolution is often credited. What appears more probable, then, is that in the long run, indigenous technologies are likely to arrive at stagnant points beyond which state the malthusian population/resource disequilibrium may set in(Baba, 1975).

Boserup seems conscious of the issue in question when she conceded that though "growing population may in the past have destroyed more land than they improved" modern techniques could be used to reclaim such sterile lands. Baba (op. cit., p. 30) argues on the basis of this that: "the hope which Boserup expressed in modern agencies of change to bring about

desired changes in traditional agriculture is a recognition of the limited technological scope of such communities".

The fundamental question which emerges from the foregoing is that having recognised the limited scope of indigenous technologies, one would expect Boserup to indicate the optimum population size or pressure beyond which diminishing returns in the performance of indigenous technologies would prevail. Allan (1965) has coined the term "critical density of population" to mean the density beyond which deterioration of land is bound to set in. Mortimore (1971) has argued that the concept, which was developed to calculate the human carrying capacity of native reservation in what is now Zambia in order to avoid ecological damage, is a conservationary concept. This is because, according to him, the concept can hardly contain the essentially dynamic reality of changes in a landuse system under demographic pressure or commercial opportunities. It is to be emphasised here, however, that due to the essentially dynamic character of changes in landuse practice in any society, the task of formulating an all sufficient concept is far from being an easy nut to crack. Afolabi Ojo (1968) has highlighted the nature of the problem when he

observed that although in Southern Nigeria, there is a defined upward trend which brings the population density ever closer to the cirtical density of population,one cannot talk of overpopulation pressure in the area. The authorargues that there is the need to examine the characteristics of local areas and micro-regions in order to understand the determinants of critical density of population and the possibilities for the best use of the land that would reduce the pressure.

Clearly, the absence of such a model does not invalidate Boserup's defence of indigenous resourcefulness. She has demonstrated that far from being "inherently indolent and economically inert" and therefore dependent on external sources for developmental changes, primitive/traditional societies are indeed dynamic. They are and have been subject to agricultural evolutionary changes stimulated by demographic pressure. As it were, the traditional farmers in the Zaria area cannot be excluded from this scheme of indigenous resourcefulness. Their responsiveness to change under population pressure, as expressed in commercial opportunities, is a major determinant in the transformation of rural Zaria; and it is the main theme of this research work.

2.1.2 Urban-Industrial Model

The other thesis on agricultural change gives prominence to the urban industrial centre as a "growth pole" providing the necessary stimuli for the promotion of agricultural and general economic developments. An early proponent of this thesis was Von Thunen (1826) who found his central place model useful in attempting an analysis of spatial variations in the conduct of agricultural enterprise and labour efficiency around major settlements. However, since the Thunian pioneering model, other attempts have emerged.

Kudiabor (1977) has observed that the approach of Perroux (1950) was to limit his growth pole hypothesis to the firm and its economic area of influence and that the main substance of Perroux's (Ibid.) argument is that a growth pole is "a place of passage of forces..... from which centrifugal and centripetal forces operate". To Kudiabor (op. cit.) the repulsive and attractive forces so operative must be seen as forces of overall development of African economies. He noted that some African towns are inactive as development centres and that in the planning for developmental change, these inactive

urban centres should be made growth centres for agricultural, industrial, commercial and cultural development.

In discussing Perroux and Hirschman's view on the role of growth poles, Gauthier (1970), according to Adalemo (1977) recognised the importance the co-authors placed on the situation of unbalanced growth through space when Gauthier pointed out that "inter-regional inequality of growth is an inevitable concomitant and condition of growth itself".

One is not left on the crossroads about the fact that, like those mentioned above, several urban-industrial theories are concerned with general economic development with little specific reference to agriculture. One notable exception however, is Schultz's (1953) urban-industrial model. Schultz's thesis will, therefore form the main focus of the discussion in this second part of the literature review.

Schultz's model emanates from his investigation of the impact of urban industrial location on agricultural development in the United States of America. Schultz's findings according to Baba (1975)

"imply that economic development, generally, and agricultural development in particular is stimulated most efficiently by the growth of industrial urban centres". The effect of the imbalance in the level of urban economy between areas forms the basis of "factor and product markets".

Baba recognises co-authors, Hayami and Ruttan (1971), who picked on a major policy implication that is consistent with the model (op. cit., p. 31) and relating to the technologically advanced countries. It is that the development of agriculture in the less developed areas of the advanced countries can be increased in one of two ways: either by decentralizing industries or through the migration of surplus agricultural workers to more distant urban industrial centres. Regarding the "third world" or "developing countries" and from the view point of development planning, the authors see the model as of little or no relevance for three reasons. These reasons are stated below and the remark of the present writer is made in each case.

(i) That the developing countries are more concerned with the attainment of satisfactory growth rate in the non-farm sector than in the spatial distribution of economic activities.

One cannot help seeing this view as thoroughly misleading when one considers the directed attempts to distribute economic activities in three developing countries in Africa. Kenabantu-Kapinga (1977) documents rural industralisation in Zaire as a programme which aims to achieve the elimination of regional imbalances as one of its objectives. On Ghana, Kudiabor (1977) writes of the four-tier hierarchy of growth centres, two of which are basically industrial in function and which locate virtually in all of Ghana's main regions of South-east, south-west, central and northern Ghana. The growth centres function as industrial hub of the region they serve as Tamale serves the northern part of the country.

In Nigeria, the official policy of even development of the 1979 - 1983 administration, together with the location of industrial estates

in the northern, western, and mid-western and eastern regions (Nigerian Trade Journal, 1965) shows the distribution of economic activities in space.

(ii) The next reason is that whereas the agricultural labour force is constantly growing, the technological requisites for rapid agricultural development are not usually available.

To this claim, the present writer is of the view that its validity is questionable. In a study of Gombe Emirate of Nigeria, Tiffen (1971) found that the introduction of new crops and the adoption of a variety of new farming techniques, including the use of ox-drawn plough, had resulted in higher yields from farmers owning larger plots. Grove (1961) has traced the spread of mixed farming and of soil improvement practices around major towns and cities of Hausaland.

(iii) That the growth rate of urban population, due to the influx of people from the rural areas, is more than available job opportunities in the urban centres.

It is to be stressed in this score that the picture is not as gloomy as the authors might want the reader to believe. Reference has been made to the efforts of developing countries to distribute economic activities to attain even development. Other countries, like Zaire, have embarked specifically on rural industrial programmes (Kenabantu-Kapinga 1977). These are well meaning efforts to reduce rural-urban migration so that in the long run, the relationship between the growth of urban immigration and the demand for non-farm labour will stabilise, contrary to the view of Hayami and Ruttan.

Implicit in Hayami/Ruttan's statement is the under-estimation of traditional societies of developing countries to provide the technological requirements for the take-off of agricultural development. The two grounds on which Baba (1975) discountenanced the submission of Hayami and Ruttan with respect to developing countries (his proxy of 'low-technology' countries) are rather interesting. These are that the main forces which propel agricultural development in the model are market forces. That although the market forces are strongest in the

industrial economies, they are nevertheless inherent in non-industrial economies. In pursuance of the pre-eminence of the market forces, he refers to the agricultural development models of Mosher and Mellor (Baba,1975,p. 32) which models emphasise the provision of access routes to efficient markets as an essential condition for agricultural development.

Baba further refers to the increase in the production of cash crops in developing countries since the colonial era and attributes such agricultural development to the extended market opportunities brought about by two antecedents. These are

(i) demand for industrial raw materials; and

(ii) provision of transport infrastructure which facilitates the evacuation of goods and movement of people.

His standpoint enjoys several vindications besides those of the models mentioned above. From Nigerian standpoint, further justification of the market forces is readily available.

In his study of fadama land of North Central Nigeria, the variable which Turner (1971) found to have a strong positive relationship with the proportion of

fadama land under cultivation was settlement density (a proxy of market force). In a latter work based on Fara Kwai, near Zaria, Baba (1976) observed that the proportion of land devoted to yam cultivation reduced with increasing distance from the main road and from the roadside market. This indicates that a positive correlation exists between accessibility factor and spatial distribution of yam plots in the area.

The impact of the accessibility factor has also been documented by Ajaegbu (1977) who sees 'the influence of the railway and later the major roads' as one of the factors which account for the increasing role of rural dwellers in regional economic development in Nigeria. Thus, given the right incentives in the form of market opportunities and transport infrastructure indigenous communities will make positive responses by changing their agricultural practice and increase food production.

Clearly then indigenous communities have the technological requisite for agricultural development. But whether such technologies can cope with indefinite demographic/commercial pressure is doubtful.

Baba (op. cit.) has observed that "it cannot be assumed that indigenous communities can indefinitely improve on their farming techniques under the impact of increasing economic opportunities". This same author reasons that, in theory the favourable responses which indigenous farmers make to economic opportunities will be subject to the limit of their desire for increasing material well being. That the eventual arrival of the indigenous agricultural society at a technological "ceiling" will prevent further development until a technological innovation presumably from an external source prevails. This implies that if the desire in question changes for good (increases), their favourable response to new commercial opportunities will sprout and the position of the ceiling too will change. Mortimore (1971) refers to the concept of limited environmental potential which sets a ceiling to the number of people a piece of land can support and notes that the ceiling presumably drops as the standard of living rises. It could be inferred from Mortimore's view that as the society experiences changes through time and space the ceiling changes position.

The whole argument then reduces to a process of change in the desire of the indigenous farmer, his

responses to new opportunities and in the position of the ceiling. Through this evolutionary process of change, the ceiling ceases to be the limit but mere marks representing the various stages in the process of development. The eventual arrival at the prime ceiling will mark the limit beyond which no development takes place until a technological breakthrough provides a remedy.

In conclusion, this writer observes that similar to the observation made in the case of demographic impact, the question which arises from the concept of technological ceiling is that while the concept stands accepted, one is left with the problem of finding an acceptable indicator to show just when an external technological remedy is most needed.

2.3 Relevant Nigerian Case Studies

This final section of the literature review deals with three major antecedents which are closely related and which are central to this research project. These are demographic pressure, market opportunities and the farmer's response as shown in changes in his agricultural landuse practices.

In her study of indigenous agriculture in Gombe Emirate of Nigeria, Tiffen (1971) observed that the

characteristics of change had occurredwithin a time span of six decades, 1910-1970 and identified the following factors as the agents of change.

(i) A population increase of the order of from 120,000 to 700,000.

(ii) Higher prices which played dominant role in bringing about changes in the production of cash crops.

(iii) Improved communication which opened the area hitherto poorly linked and isolated.

(iv) A widespread technological change emerging within the communities and involving the switch from the hand hoe to the plough and the consequent acquisition of more land and labour in the farmland.

These factors had made the area a major exporter of grains, animals, cotton and groundnuts in 1970, according to Tiffen. Within the chain of actions and reactions the responsiveness of the farming communities becomes very apparent.

According to the report of a project study of two rural communities near Zaria (Baba, 1976) accessibility factor and market opportunities were found to be behind the increased yam production in the area. In their spontaneous response to the urban market stimuli and to the efficient access route via the major road, the rural farming communities had changed their pattern of production in favour of a rapid increase of yam cultivation. This report sees the yam phenomenon as an evolution rooted in the rising commercial motivation of farmers in the area.

The evolution of yam cultivation has been borne out by Mortimore (1978) who remarked that intensification of landuse and changing crop patterns may be observed in the expansion of yam cultivation around Zaria. According to him, the new practice which involved the growing of yams on mulched ridges has been brought about by the high prices of yams in Northern urban markets.

Hogendorn (1970) documented an interestingly dramatic switch from cotton production to that of groundnut in Kano area about 1912. The Kano agricultural switch arose from the impact of higher

relative export prices for nuts, and the construction of a railway linking Kano with the seaport. Market forces had been expressed in the new demand for nuts between 1906 - 1914 following the manufacture of margarine as a new product in Europe. A well organised agriculture and marketing system of food at the time had supported a high population density including an urban segment relatively large for the era. Permanent cultivation with animal and green manure had replaced shifting cultivation in parts of the province. Irrigation and metal farm implements made by local iron-smiths were used. It will then appear from the Kano experience that extension of commercialised agriculture affected the demand for labour which in turn stimulated the migration of people to the area. When, therefore, a potential source of new income offered itself, a reservoir of agricultural experience was available to respond to the price stimuli. The long existence of intensive landuse practice in Kano area has been documented elsewhere (Grove, 1961; Mortimore and Wilson, 1965; Mortimore, 1971).

Observing the impact of population density and market forces on West African food farmers, Hill (1970) remarked that the spectacular increase in West African

urbanisation had resulted in a vastly expanding demand for marketed food. The author judges that the farmers seemed to have organised themselves to keep pace with the demand. Although demographic pressure and market demand are two separate factors, their impact in this case is not clearly separable.

As regards the responsiveness of the farmers to external stimuli, Hill maintained that between the two world wars, before swollen shoot destroyed much of cocoa, the farmers responded to a higher world cocoa price by buying more land.

Norman (1972) showed the relationship between population density, the size of farm holding and accessibility factor. He found that average and median size of farm holdings increased as population density decreased and communication with Zaria becomes more difficult. The influence of Zaria is shown in the characteristics of settlements which are closer to and are linked with Zaria through efficient access route. As was the case in Kano (Hogendorn, op. cit.), progressive commercialisation of agriculture which finds ready market in Zaria may have led to labour immigration thus, raising population density.

All said and done, there seems to be much to confirm the influence of population density and new commercial opportunities in changing the agricultural patterns of rural communities. The installation of access route has also been shown to stimulate the process of agricultural change. It is also on the basis of this point that Baba (1976) reasons that the provision of access routes to the rural areas becomes a priority issue and key to the nation's effort to boost agricultural production.

However, some gaps are evident in some of the works reviewed under this section. For instance, Tiffen (1971) observed that the control of prices of agricultural products led to production reduction and to an average loss of about £33,000 per annum during the years 1950 - 1966. The implication of this to the present study is that such official price control is absent in the marketing of the Zaria yams. This leaves the production level to be influenced by changing expectations of farmers.

Moreover, there are no indications of the use of aerial photographs in the reviewed studies whereas they were used in the present research to show the

nature of changes in landuse practice through time and space. As the present research endavours to close the observed gaps, it hopes to arrive at valid results as well as spotlight areas for further research.

CHAPTER THREE

THE GEOGRAPHICAL AND HISTORICAL SETTING

3.1 Location of the Study Area

Igabi, Fara Kwai and Dunki on which the present research was based are all located in Igabi District of Kaduna State (Fig 1). A description of their locations is given below beginning with Fara Kwai. In each case, reference is made to their varying population sizes.

Fara Kwai (2,508 in 1963) is located at a point 34 km on the Zaria - Kaduna road, It thus benefits from a highly efficient inter-urban flow route which gives it a direct access to the northern urban markets of Zaria, Kano, Funtua, Sokoto, Katsina and Maiduguri as well as the southern market in Kaduna. This locational advantage together with an extensive yam producing hinterland stretching over 10 km on the Fara Kwai - Amana Road, has placed a positive impact on Fara Kwai as the biggest road-side yam market on the Zaria - Kaduna highway.

Igabi (5,495 in 1963) has the highest total population, but experiences a less efficient access route compared to Fara Kwai. As shown on Fig. 2,

Fig.i : ZARIA RFCONNAISSAM^F PURVEY ARBAS

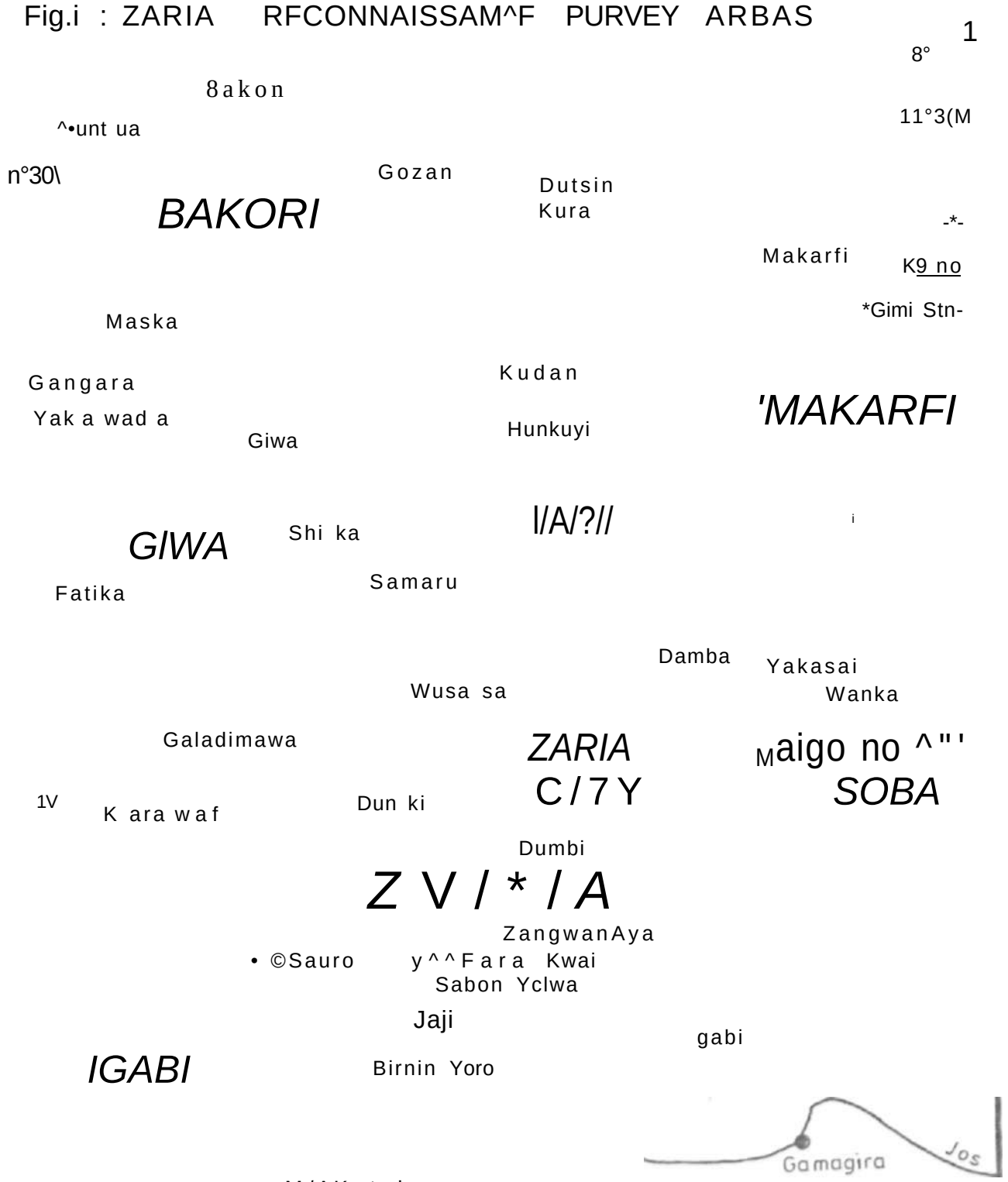
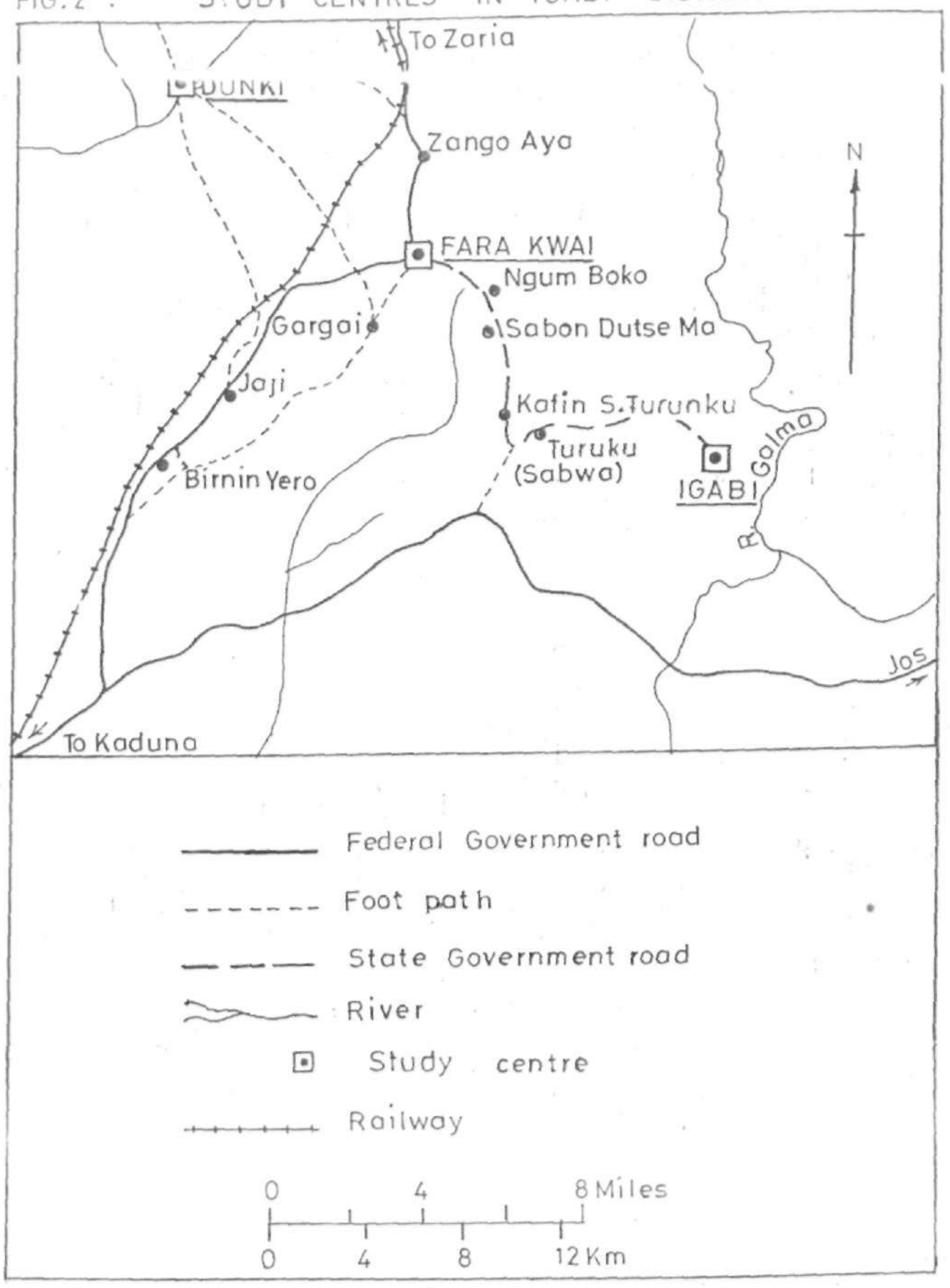


FIG. 2 : STUDY CENTRES IN IGABI DISTRICT



two seasonally motorable routes may be used to reach Igabi village. The first is by way of Fara Kwai - a 27-kilometre route inland from Fara Kwai. The other is a 15-kilometer route from Amana on the Kaduna - Pambegua road. (Both routes meet at a point where Igabi village is 12 km away. The Galma River valley is about 3 km from the village).

Dunki (1,014 in 1963) has the lowest total population as well as being the least accessible of the three villages. Access routes to Dunki are by footpaths only and one such paths penetrates from Dumbi, 20 km on the Zaria - Kaduna road. It crosses the rail and winds some 6 km to Dunki, north - west of Fara Kwai (Fig. 2). The location of this settlement close to an area which is liable to floods contributes to the inaccessibility of Dunki specially during the rainy season.

3.2 The Physical Resource Base

Physiographically, the Zaria Area consists of a peneplain which developed on pre-cambrian rocks and characterised by a gently undulating terrain. The general elevation is about 670 metres (2200 ft.) above sea level. Rising above the general level are

isolated inselbergs which are associated with older granite. The most outstanding of these resistant masses are Kufena (821 metres), Turunku (797 metres), Fara Kwai Hills (c.810 metres) and Hange Hill (746 metres). Low and resistant ridges and rock plains composed of cemented quartz grains and pebbles as well as few cappings of iron pan are readily observable in the surrounding. The plains are underlain by the basement complex which is covered by varying thicknesses of sandy and silt deposits formed either by weathering or transported from the north during recent geological periods. These deposits form the basis of the predominantly deep soil which is fine and medium in texture. The area is well drained in most parts, but there are imperfectly drained portions the frequency of which increases proportionately downslope.

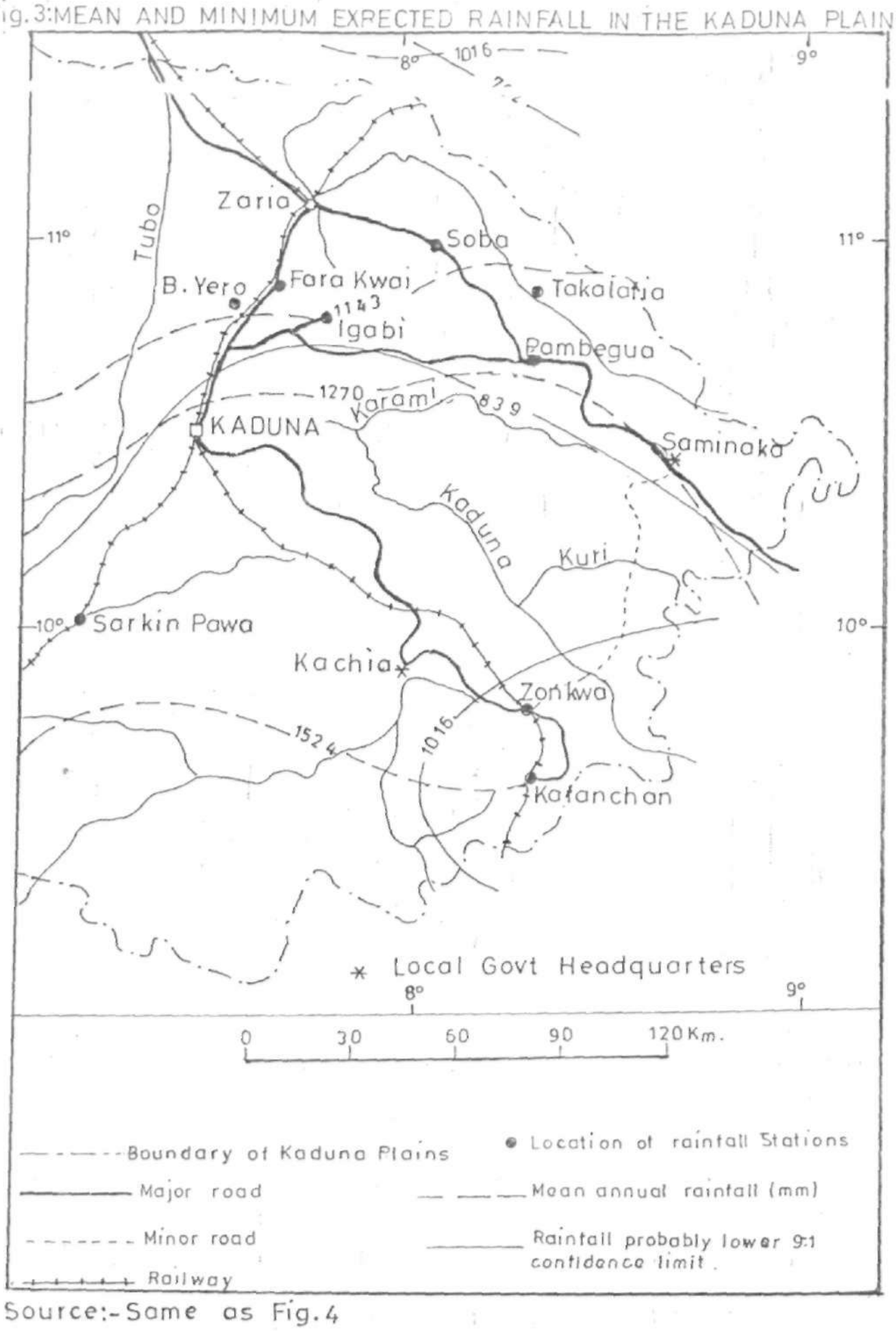
There are two contrasting seasons in the area. From October to April/May, it is influenced by the dry north-easterly winds which yield virtually no rain. During these months, vegetative growth reduces to a minimum and cultivation in the upland farm ceases. From April to May, the season changes, the moist south-westerly winds bring rain and both cultivation and

plant growth respond almost immediately. The rainfall regime continues till September/October leading to an annual total average of about 1050mm with a tendency towards an August/September maximum and giving rise to the Guinea Savanna which is denser and more humid than the Sudan Savanna. The 1143mm normal average rainfall for Igabi (Fig. 3) spreading over six months from between May to October (Fig. 4) is long enough to meet the growing season duration required by indigenous crops in the area. The growth of yam tubers, like other food crops, is made possible by the favourable combination of temperature (no monthly average is below 18°C) and rainfall on the favourably deep soil of the plains. These are physical resources that are basic to thriving commercial agriculture in the Zaria area. Equally important however, is the human resource base.

3.3 The Human Resource Base

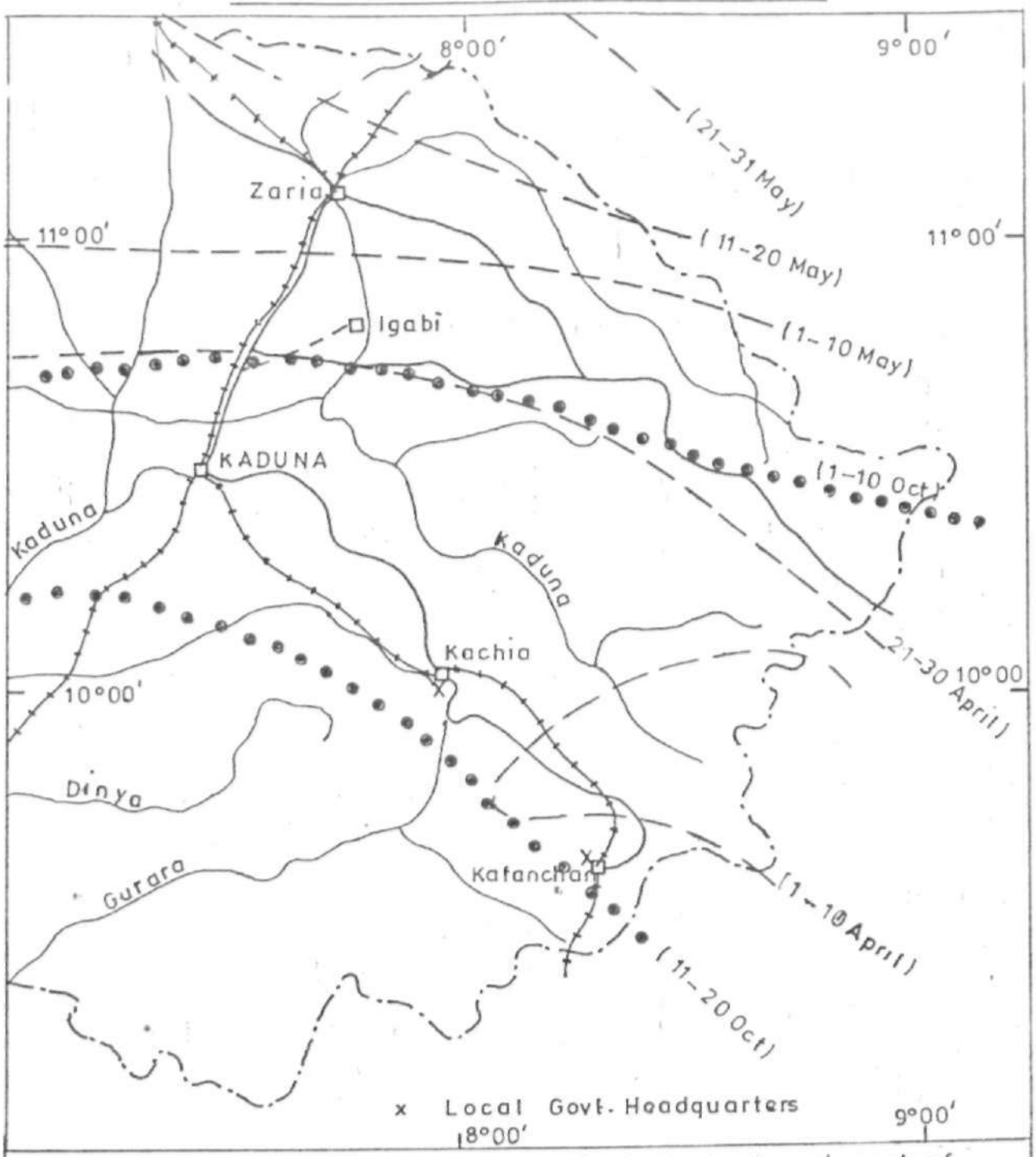
Two distinct components of the human resource base may be identified as having direct bearing on the transformation of rural Zaria. The first is the urban population which forms the market, while the other is the rural population whose appreciation

Fig. 3: MEAN AND MINIMUM EXPECTED RAINFALL IN THE KADUNA PLAINS



Source:- Same as Fig. 4

Fig.4: ISOCHRONES OF THE START AND END OF THE RAINY PERIOD IN THE KADUNA PLAINS



Source:- A Blair Rains et al (1977 Land resources of Central Nigeria, Vol.3 Climate and Vegetation, Text map 21.

for new income opportunities has much to do with the extension of commercialised agriculture in the area. Furthermore, since the influence of urban Zaria on the productive process of its rural hinterland is likely to be very substantial by virtue of its relative proximity, prominence is given to the evolution and character of the population of Zaria town.

The growth in urban Zaria which had a beneficiary effect on the commercialisation of agriculture was based on the increasing number of southern Nigerians in the urban complex. The growth which Davies (1976) saw as an "alien one in a very real sense" started with the construction and completion of the railway to Zaria early in 1911(Dhliwayo,1980). This event was followed closely by the construction of road network so that together, routes converged on Zaria which became an important centre. Gana (1977) observed that by focusing on Zaria, transport routes have enlarged the town's capacity for growth including that of becoming an important bulking and distributing centre.

In response to the nodal advantages of Zaria many trading firms established their headquarters as well as plants for the processing of agricultural

products. Consequently, there were increases in Zaria's commercial activities as well as growth in its urban population. A steady increase in the number of small and large scale industries in the town had also been documented by Davies (1976) and Jaworek (1980).

Changes in Zaria's population figures may then be considered against the foregoing historical background. According to the Native Authority estimate of 1914, the population of Sabon Gari was 1,809. By the 1963 census, it was 15,842 while that of the area north of the walled city (Tudun Wada) was 78,315 and that of the city itself was 34,872. The figure for urban Zaria comprising figures for Sabon Gari, Tudun Wada and the City totalled 129,029 by the 1963 census.

Population figures covering the studied rural centres were also obtained. According to a District Report,* the number of farming families in 1979 were Igabi 1,086; and Fara Kwai 420. The figure for Dunki was not included, but the population sizes of the

* Office of Kaduna State Integrated Rural Development Project, Maigana, Field Survey, 1982.

three villages were given by the 1963 census as: Igabi 5,495; Fara Kwai 2,508; and Dunki 1,014. It is to the farmers of these centres that the thrift, frugality and enterprise of the commercial agricultural production of the area must be credited.

However, the population figures dealt with so far are not recent enough (reference has been made to the problems facing censuses in Nigeria in Chapter one of this study). Besides, the figures lack the breakdown which is useful for an assessment of market and labour potentials of rural communities. For this reason and in the absence of up-to-date data on the population of Zaria, a population projection has been undertaken using the 1952 census figures, and projected to 1983 - a span of 31 years.

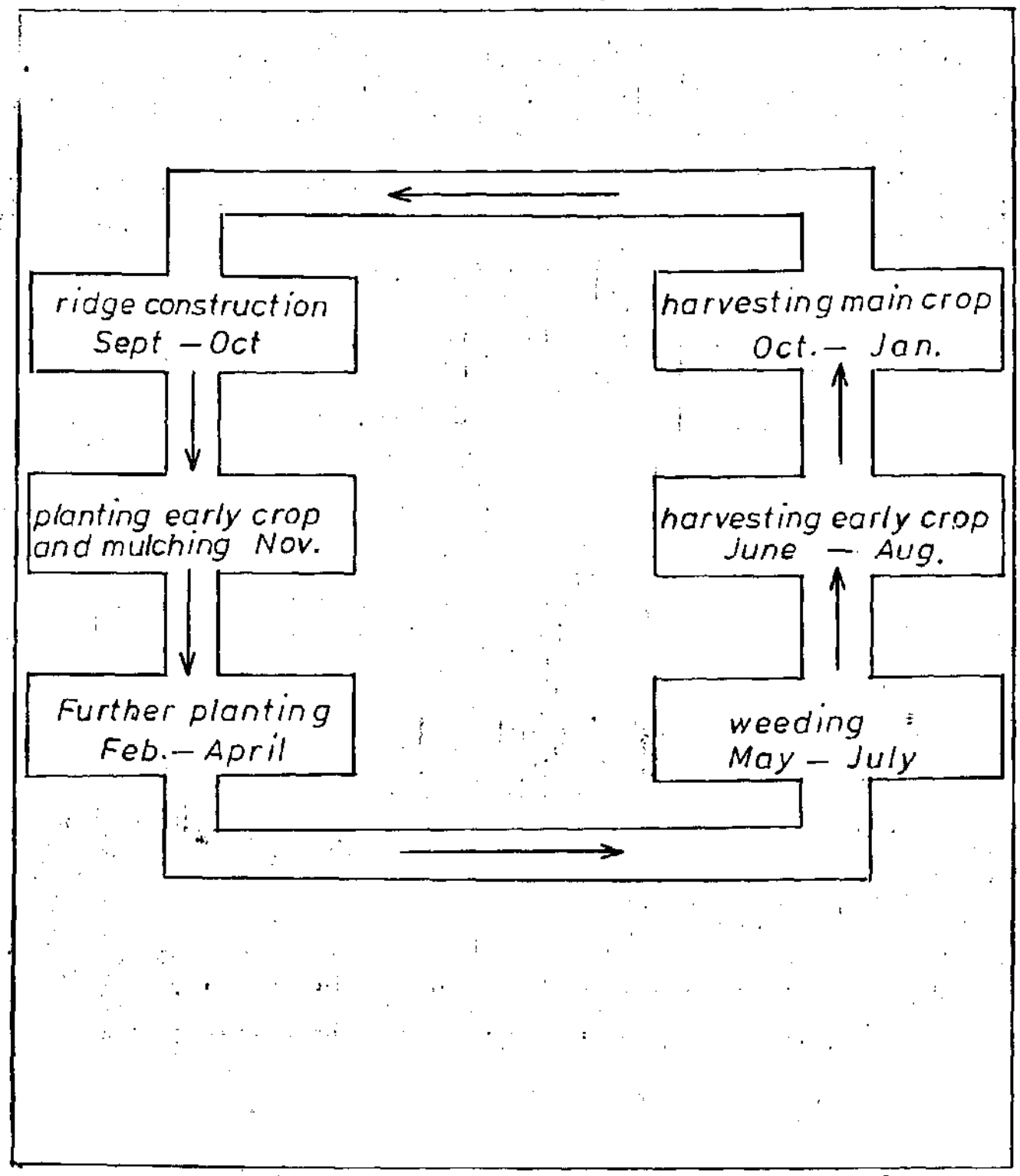
The population of Zaria according to Ajaegbu (1976, p. 31) appears to represent Zaria City only. This source shows the growth rate of Zaria between 1952/3 and 1963 to be 5.5% whereas an examination of the same figures by Brown (1984) shows that the growth rate was higher. Medugbon (n.d.) shows the

population of Zaria township for 1952 and 1963. Calculating the rate of growth of Zaria township between the two periods, Brown (1984) arrived at a growth rate of 6.5%. This growth rate was used in the projection exercise because it was derived from changes in the population of the whole of Zaria township.

By its relative numerical strength, the working population (age 15 - 50 years) in Fig. 5 is likely to exert a strong demand for agricultural products from the rural hinterland. It is also a pointer to the labour potential of the area. Males and females in this class interval represent 54% of the total projected population.

Nevertheless, this projection assumes a constant percentage change in all the age groups. Furthermore,

Fig.6 : Cycle of Yam Production in Igabi District. Zaria.



Source:-Field Survey 1980

the use of a constant growth rate of 6.5% throughout the period of 31 years is unrealistic. This is because the growth could have been played down by factors such as the Nigerian civil war (1966-1970). It is likely that the growth rate could have risen above 6.5% during the post-war years through increased urban immigrations. The above are the weaknesses which impose serious limitations on the data. However, in the absence of up-to-date data, the figures may be accepted as indicators of the characteristics of the population of Zaria; and its potential for stimulating spontaneous changes in the agricultural economy of rural Zaria.

Moreover, according to Ajaegbu's (1976) observation about the composition of urban population in Nigeria, Zaria town seems to have a high proportion of its elite group,the base of which is to be found in the many institutions of learning, placements in the public services, the Armed Forces and several sectors of the economy. Clearly, the importance of the elite group in the transformation of rural Zaria lies in its demand, backed by cash earnings, for agricultural products from the rural communities. This group has, therefore, given the Zaria urban market a demand effectiveness which is stimulating changes among the rural producers.

On the other hand, the rural farmers themselves have demonstrated their capability for change. The cultivation of grains like guinea corn and millet and cash crops such as groundnuts and cotton have been very well organised. The practice of planting most crops on ridges with the use of household manure/ fertilizer has also been well established. There has been the availability of artisans like ironsmiths who produced farm implements such as the hand-hoe (patanya) and the local shovel (gara) used for ridging. Thus the required farming skills and associated resources among the rural population have been available and ready to tap potential sources of new income opportunities based in the urban market.

Of the Zaria urban market, attempt has been made to highlight its population size and characteristics as a way of assessing its market viability and labour potential. Attempt was also made to assess the potentiality of Zaria to provide the desired market stimuli for continued rural production and development. Towards this end, documentary sources and questionnaire (Appendix IV) were used to study the turnover of industrial, commercial, public and

educational establishments in Zaria town. Primary schools were not included in the exercise because they were closed due to the industrial action of teachers when the survey was conducted in December, 1982. The number of students were not included in the Educational institutions shown in Table 3.1 since the figures were not forthcoming from the institutions.

Table 3.1 shows the outcome of the survey. Due to incomplete data, the increase or decrease percentage of four establishments; A.J. Seward, First Bank, Nigerian Railway Corporation and Police Headquarters; could not be calculated. Only two establishments; Zaria Industries and G.B. Olivant; recorded decreases of 27% and 50% respectively in their labour force. 15 of the 24 establishments recorded increases in their labour force during the period under review. This represents 60% of all the establishments or 75% of establishments with complete data. The Electricity Meter Company recorded a remarkable increase of 5900%. Two other establishments recorded increases of over 1000% while seven of them increased their labour force by over 200%.

It may be noted that the establishments in Table 3.1 do not include small scale industries

which numbered 1443 during the 1973/74 period (Jaworek,1980). Jaworek (1980) points out that the possibilities of merging between industries to form larger units exist. According to Jaworek, the blacksmith and the carpenter can jointly make products which cannot be produced if they operate separately.

From table 3.1 6,573 workers were engaged in 24 establishments in 1982. This figure is besides their dependents and workers who are engaged in establishments which failed to respond to the questionnaire survey. Moreover, the figure does not include workers in the small scale industries. Since these are workers in urban Zaria, they possess the essential characteristics of the elite group one of which is their effective demand backed by their income earnings for agricultural products from the rural communities.

Perhaps it is the institutions of learning in Zaria town which together constitute the strongest single factor in promoting population agglomeration in Zaria. The role of Zaria as an educational town dates back almost four decades and there has been no

Table 3.1: Industrial, Commercial, Public and Education Establishments in Zaria Town: Trend of Labour Turnover

Establishments	Activities	Date established	No. of workers when established	No. of Workers in Dec. 1982	% Change
A: Industrial Establishments					
1. Cotton & Agric. Process	Ginning	1911	280	280	± 0
2. A.J. Seward	Processing & Marketing	1964	n.a	147	± 0
3. Zaria Industries	Tarpaulin manufacture	1974	405	286	29% decre
4. Electricity Meter Company	Manufacture	1977	5	300	5900% inc
5. Rigidpak containers	Manufacture	1980	40	70	75% incre
6. Nig. Automative Compontnts	Manufacture	1982	30	42	40% incre
B: Comm. & Banking Establishments					
7. First Bank, Zaria	Banking	1912	n.a.	70	± 0
8. G.B. Olivant	Distribution & Wholesale	1948	50	25	50% decre
9. C.S.S. Bookshops	Sales of Bks & Stationeries	1949	12	18	50% increas
10. Northern Nig. Pub. Company	Book publication	1966	7	55	686% incr
11. United Bank for Africa	Banking	1967	12	52	333% incr
C: Soc. Security Establishment					
12. National Prov. Fund	Soc. Security Scheme	1970	2	6	200% incr
D: Public Corporations					
13. Nig. Railway Corporation	Transport services	1910	n.a.	3500	± 0
14. P & T Postal Division	Postal Services	n.a.	68	112	65% incre
15. Post & Telecommunication	Communication services	n.a.	n.a.	700	± 0
E: State Ministries & Departments					
16. Ministry of Health	Medical services	1954	26	104	300% incr
17. Chief magistrate court	Administration of Just.	1975	10	32	220% incr

...../2

Table 3.1 (Contd.)

Establishment	Activities	Date Established	No. of workers when Established	No. of Workers in Dec. 1982	
18. Ministry of Justice	Judicial services	1976	2	8	300% increase
19. Div. Audit Office	Auditing	n.a.	11	11	± 0
20. Police Headquarters	Maintenance of Law & Order	n.a.	30	n.a.	± 0
F: Educational Establishments					
21. Barewa College	Education	1923	71	103	45% increase
22. Kufena college	Education	1953	6	92	1433% increas
23. Nigerian Military School	Educ. & Military training	1954	40	475	1088% increas
24. Women Teachers College	Education	1982	12	78	550% increase
			1126	6573	

Source: Field Survey, 1983

indication that this role will reverse. According to the Zaria Provincial Report (1945), "many schools, colleges and training establishments of various sorts are to be centred here, and these will give Zaria a special significance and status in the future progress of Northern Provinces".

With reference to Table 3.1 the employment increases recorded for Kufena College, Women Teachers College and the Nigerian Military School are very high indeed. From 6 in 1953 to 92 in 1982, from 12 in 1971 to 78 in 1982 and 40 in 1954 to 475 in 1982 respectively. Even higher in aggregate increase (student and staff) is the Ahmadu Bello University as shown in table 3.2:

Table 3.2: Growth of Students and Staff in Ahmadu Bello University, Zaria

	1962/63	1973/74	1979/80
Student	425	7977	11758
Staff*	142	4364	10078
Total	567	12341	21836

Source: The Ahmadu Bello University Digest of Statistics, Vol. 2 September, 1980 pp. 19, 33 and 47.

*Staff figures include senior, intermediate and Junior staff of the various units of the University i.e. direct teaching units, teaching support units, organised research units, public service units, administrative support units, institutes and colleges. The staff figure of 142 for 1962/63 represents senior staff only. The record for junior and intermediate staff was not available according to the source.

One weakness which arises from table 3.2 however, is that, whereas the concern of this project at this stage is on urban Zaria, staff figures as shown in the table include all units of the Ahmadu Bello University within and outside Zaria.

Moreover, the students figure of 11758 for 1979/80 excludes students of Diploma in Accounting, Banking, Insurance (Arts and Islamic Studies who were transferred to Bayero University, Kano) and Year I enrolment of NCE by correspondence.

Further emerging from the Zaria urban study is the fact that 19 institutions of rank of teachers' colleges and secondary schools and above locate in Zaria/Samaru excluding the Ahmadu Bello University complex. Thus in terms of educational institutions and other establishments in Zaria, the list on table 3.1 is by no means exhaustive. The 25 establishments shown, therefore, represent those establishments which received and responded to the questionnaire which was prepared to investigate the growth of Zaria urban dynamics.

Yet, although the list is not complete, it gives an indication of the trend of growth prevalent

in Zaria town. Against the background of a projected total population of about 649,540 (fig. 5) the trend so indicated can be considered adequate to maintain increasing demand for yam and other agricultural products from Zaria's rural areas. The basis of the market resources needed for the commercial agriculture in the area may be considered established. This basis is extended very considerably when it is remembered that the demand for and the marketing of Zaria agricultural products particularly yams go far beyond/the confines of Zaria and include other northern towns and Lagos. This fact was revealed during the questionnaire survey among middlemen in the study area (Appendix III).

But although other towns have a share in the agricultural trade of this area, the influence of Zaria has remained one of the strongest impetus to yam production in the area. It is Zaria also which formed the source of the initial demand which set in motion the yam evolution which now takes a commercialised dimension. This is because as early as 1946 yams were sold in Sabon Gari market in Zaria under a control price of one penny per pound weight (Zaria Provincial Report, 1946).

This historical evidence clearly suggests that a high demand existed at the time which necessitated an official control of yam prices. Such a demand arose in the wake of growth in Zaria's urban population following the construction of roads/railway and the nodal position which Zaria was assuming in the emerging road network. The influence of this urban event on changes in the rural landuse system suggests the existence of relationship between changes in Zaria urban growth and those of the rural landuse economy. Consequently, attention now focuses on the rural economy.

3.4 The Rural Economy

This section gives a broad exposition of the modes of production and exchange under the rural econmic system. It refers to the income sources of the people, before the commercialisation of agriculture in the area and how the income was used to improve their standard of living. Other factors considered are the sources of capital which was used for the take-off of commercial yam production and whether the process was gradual or not.

Agriculture has remained the key of the rural economy and production has centred on a variety of crops based essentially on subsistence economy. Millet and guinea corn are staple food crops but they are also exchanged for cash in the local markets. Inter-cropping has been widely practiced involving grains and vegetables. Before the commercialisation of yam, cotton and groundnut had been two major sources of income although groundnut is also consumed locally. Seasonal migration to urban areas for off-farm season job had been economically motivated. Localised trade supplied essential requirements. Simple handicraft work, smithing, construction of living quarters and the digging of wells have remained other main occupations in the production and exchange economy of the area.

However, inspite of the involvement of the people in the occupations at one time or the other, they were engaged, as a rule, in subsistence farming as this ensures that food is available for dependents of the family. To the occupational list may be added the butchers and operators of cottage grinders used for grinding grains for the preparation of traditional food like 'Tuwo' and 'Fura'.

The various pursuits above, by and large, were the sources of income to the rural societies before the commercialisation of agriculture. In addition to the building of living quarters with the use of local materials mainly and the digging of wells for water supply, the generated incomes were used in other ways to improve the standard of living of the poople. These include expenditure on health services such as payments to local midwives, the purchase of drugs and the cost of transport to urban health centres, expenditures on cotton goods and on religious obligations such as going on pilgrimage. The payment of taxes also deserves mentioning in the list of expenditures. Salt and palm oil are food items which must be paid for; but of significance perhaps is the gradual acceptance of new foods and the resultant expenditures on foods such as tea, bread and tinned milk.

The rural economy may then be said to have involved the provision and exchange of essential requirements. The scale of farming had been smaller and simpler and cash investment tended to have played a minor role in the largely subsistence agricultural economy.

With reference to large scale agriculture, the treatise pauses to examine the sources of capital which was used in the take-off of commercial yam cultivation in the area. The project revealed several ways in which land was made available to members of the communities for agricultural purposes. While other avenues included purchase, inheritance, loan, hire and gift; the availability of land to respondents clearly shows that land was not a scarce resource. However, the availability of land at any point in time to an individual farmer is likely to be a function of the size of the land required, besides other factors. The availability of land in the area therefore, means that the acquisition of land for agricultural use required little capital outlay, at least during the initial stages of the agricultural change.

Labour, on the other hand, is another important factor of production and the influence of its availability on the size of farm holdings has been observed elsewhere (Hill, 1970; Norman, 1972; Tiffen, 1976; Etuk, et.al., 1981). Although Zaria's rural societies are no exceptions to the labour constraints, labour requirement at the initial stages of the

transformation seemed to have been met largely through family labour and that of relatives and friends. Field survey suggests that hired labour was not practised perhaps because farm sizes were not large enough to warrant it.

Fig. 11 suggests that the area under the cultivation of yam rose steadily between 1960 and 1970. The tempo increased in 1970 when the commercial extension probably set in. It would appear that the agricultural change which triggered the transformation in rural Zaria was until 1970, moderate in scale. Thereafter, it has been rapid and production has increased tremendously.

Perhaps it was within such a gradual process of take-off that the relatively limited labour from the family and relatives was enough for the small scale of farming at the time. In the absence of paid labour the capital investment on labour would be minimal since family labour required little or no financial obligations.

Since a farmer could use only one implement at a time and since according to this research the cost of implements, like the hand

hoe and the garma, were considerably low, little capital was needed for purchasing them. Moreover, seed for the relatively small farm sizes at the time also called for a moderate capital outlay which was met through the support of friends and relatives besides whatever the individual farmer could raise personally. Support from kiths was either in cash or kind (gift of seed).

In general, therefore, the total required capital investment was modest for the subsistent farms then. Support from relatives seemed a major source of capital during the initial stages of yam production in the area. These initial stages probably spanned the period between 1960 and before 1970 (Fig. 11). Until 1975 when the drop in the groundnut curve became noticeable, groundnut appeared to have been the major source of capital which was used for the take-off of the agricultural transformation. The prominence of groundnut in this role is suggested by the dominance of the plots under it in 1960 and about 15 years thereafter, assuming that these were years of normal production.

3.4 The History of Yam

Reference has been made in this treatise to the effect that the commercial production of yam in Zaria Area is a recent event (Baba, 1976; Mortimore, 1978). More specifically, the Zaria Provincial Annual Reports for 1938, 1939, 1944 and 1945 referred to crops which were grown in the area during the years as groundnut, cotton, tobacco, guinea corn, onion, ginger and sugar cane. These crops were mentioned in connection with the influence of climatic vagaries and other shock factors like locust invasion on the general performance of agriculture. That yam was conspicuously absent from the list is a strong indication that the crop was grown at a localised scale, perhaps too limited to gain official notice. From the report, it could also be inferred that yam cultivation may have been in an experimental stage at the Department of Agriculture, Samaru. The basis of this latter inferrence is to be found in the correspondence from the Department of Agriculture, Ibadan, to the effect that white yams which had done well at Moor plantation included 'Mampha' from Maigana and Fara Kwai*. Reference made to the cultivation of the

* Official correspondence between the Agricultural Department, Ibadan and the Botanist, Samaru, Zaria. October, 1944 (Zaria Provincial Annual Report, 1945).

Chinese variety by the Samaru Botanist led to a reply that "we would normally harvest our Chinese yams (water yam) about February" (Freeman, 1945).

Furthermore, the correspondence from the Acting Director of Agriculture, Northern Region, to the Principal Agricultural Officer, Samaru, sought information on the spacing and planting of yams on ridges in Mokwa. This suggests that by 1953 when the above letter was written, the practice of cultivating yams on ridges in Zaria would have been established, hence the enquiry from another part of the region.

With reference to Zaria, as at 1966 Davies, (1976) remarked that the main cash crops of this part of Northern Nigeria were cotton, groundnut and tobacco. Those of lesser importance were sugar cane, onions and yams. His data on the dominant cash crops placed yam in the third position after cotton and groundnuts. It will then appear from the foregoing that the commercialised scale of yam production in Zaria area must have gathered momentum between the early 1960s and the early 1970s. If, however, cognizance is taken of the Nigerian Civil War of 1966-1970 and of its possible adverse repercussion on general

economic activities including agriculture, the more probable date would be the early 1970s.

On the global scale, however, Davies (1960) suggests that the process of development of yam cultivation may have begun as early as 5,000 B.C. That during the time, a culture using heavy stone hoes which would be well adapted for digging tubers, and which were refinements of the Sangoan culture hoes of some 30,000 years earlier, began to spread out of the equatorial region to other parts of sub-saharan Africa. That as the northern portion of the continent became more desiccated about 2,000 B.C., the hoe using people were forced southwards into the forests and more humid zones of West Africa taking the now partially domesticated savanna species of yam with them. This historical basis is significant because it supports the widely accepted fact that yam is indigenous to West Africa (Miege, 1954; Wrigley, 1960; Morgan, 1962; Coursey, 1967).

Yam, according to Coursey(1967, p.2) is "Any of economically useful plants of the botanical genus Dioscorea. Or the tubers or rhizomes of these plants". Although the provision of calories in

food is nutritionally their major function, yams are also useful sources of vitamins and contain limited but significant amount of proteins (Ibid).

CHAPTER FOUR
LANDUSE PRACTICE IN THE STUDY AREA

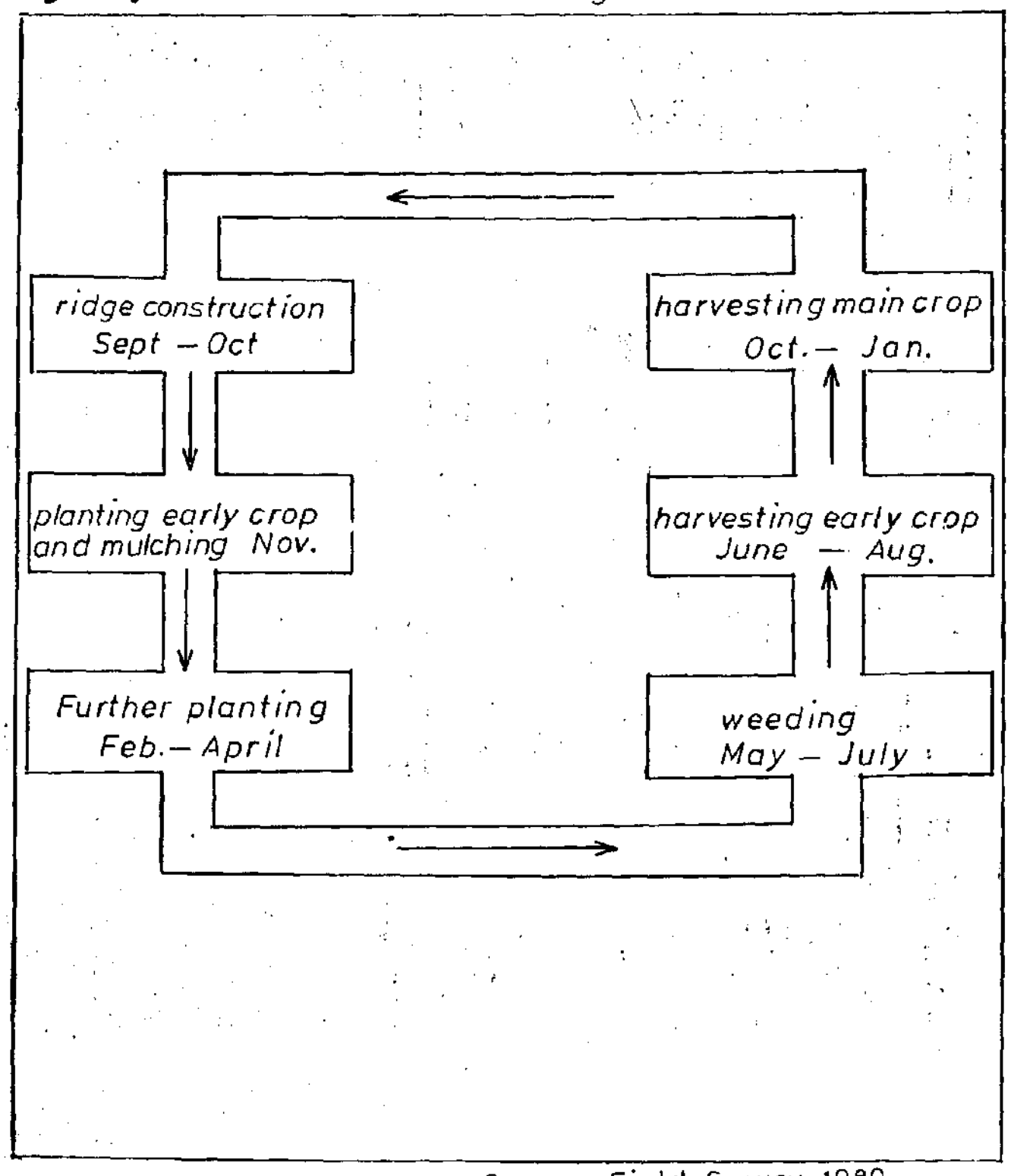
4.1 Introduction

This chapter opens with an account of the agricultural practice which attends the cultivation of yam in the Zaria Area. Next, the land tenure system which prevails in the area is briefly discussed. An indepth treatment of land tenure relationships is not attempted as this is beyond the scope of this study. Rather, our aim is to ascertain what changes, if any, have occurred in the tenurial pattern under the influence of commercial agriculture. The analyses of landuse changes together with an assessment of the impact of yam cultivation on other traditional cash crops are then conducted. Finally, the pattern of income and expenditure in the production and sales of yam and other traditional cash crops are discussed.

4.2 Yam cultivation in Zaria Area

The economy of rain water is a critical issue in the successful cultivation of yams in Zaria area. This is because the annual total rainfall in the area is just enough for root crops and yam seed must

Fig.6 : Cycle of Yam Production in Igabi District. Zaria.



Source:-Field Survey 1980

be planted early enough to enable it benefit from all the rain water. For this reason, yam is planted well ahead of the onset of the first rains and mulching is applied to reduce evaporation (Fig.6). To a very large extent, therefore, the timing of the planting activities could determine the success or failure of yam production in the area, assuming that normal yearly rainfall amount is experienced.

Planting takes place during the dry season when, due to lack of rain, the soil is hard and difficult to till. To make planting possible this time, the construction of ridges for seed is done early (September - October) when the level of the soil's moisture content is enough to unbind the soil and make ridge construction possible. Planting could then be done as the heaped soil could be dug with ease. If ridge construction is delayed, planting may not be done in good time to enable seeds take full advantage of total rainfall. To this extent timely ridge construction is critical for timely planting and this the enterprising farmer of this area knows very well.

The 'Gara' is the main implement for ridging. It has a wooden handle with an iron frame which is rectangular in shape and broad enough to make it suitable for moving earth.

Guinea corn, maize, okra and rice are inter-cropped with yams, but these crops are planted when yam vines have matured and a good grove of leaves show up. Rice is planted in the furrows between ridges to take advantage of the pools of rain water.

The rationale of the intercropping lies in providing food for the household sinceyam is produced for the market (Baba, op cit.). However, intercropping was by no means, applicable to all yam plots in the study area. There were plots on which yam was grown as sole crop. Such plots were often larger in size, and they were also strong indicators of the increasing scale of commercial cultivation of yams in the area.

That the bulk of weeding is generally done during the months of June and July has been observed by Norman (1973). In respect of yams, however, this study revealed that weeding commences in May for seeds planted in November; and it is done twice or more

during the growing period, depending on the vigour of regrowth of weeds after previous weeding had been done.

Harvesting of yams falls into two stages which are concomitants of the planting of two well marked crops. The harvesting of the early crop of yam is during the months of June, July and August beginning with those planted in Fadama areas (Fig. 6). The soil is excavated and the tuber is cut with care from the crown in an operation known as 'milking' or 'beheading'. The care exercised at this stage is necessary to avoid damages to the roots or stem. The soil is replaced and the crown grows again to produce another tuber, this time the yam seed. The harvesting of the main crop extends over four months (October-January, Fig. 6). Tubers are dug up when the tops (vines and leaves) turn yellowish brown or die down. Care is again exercised to ensure that tubers are not wounded during lifting. Packing is done soon after harvest to avoid exposure to the sun. Otherwise, exposure may lead to drying and cracking of tubers.

The application of traditional norms and values in the use and occupation of land in Zaria Province has been noted by Norman (1974) who observed that:

> Traditionally, land belongs to the Emir, whose representative at the village level is the village head. The latter distributes the land, authorises and witnesses certain land transactions.....that because land is owned by the Emir any individual can have only a usufructuary control over land. Theoretically at least, this may inhibit individuals from investing capital in improving the farm land. However, in practice, there usually appears to be little to fear of losing land on which rights of usufruct have been inherited (Ibid. p. 16).

Norman (Ibid.) further identified the application of Moslem law in the land tenure practice in the area and observed that the Law is concerned with the sharing of land among heirs. That certain transactions such as pledge, sale and loan are recognised by Moslem Law provided the transactions do not contravene the customary laws.

Documentary evidences indicate that the number and types of transactions used in traditional land tenure practice vary in time and space. Tiffen (1971) identified eight in her study of Gombe Emirate. These were inheritance, allocation, gift, purchase, pledge, loan, lease and share cropping. Luning (1965) identified

six in Norti em Nigeria: inheritance, gift, sale, pledge, loan and government. In Hanwa villrge near Zaria, Norman (197U) identified all six transactions according to I.uning other than gift: in Doka and Dan Mahawayi he identified all but government.

The transaction labelled "government" needs immediate explanation while other transactions will be explained later. According to Norman (Ibid") this type of transaction applied, only in Hanwa (which was one of the three villages studied around Zaria) and may be considered as a loan type of tenure except that no rent is paid. TVe government land in Hanwa was sold ' . .;ir Aliyu (1903-20) to the government. Farmers ars allowed to use the land as long as the government loes not require it for any purpose, but the government reserves the right to acquire the land at any time. If this happens during the growing season, money equal to the value of the crops is paid r:s compens' fcion .

That [=1 uiwf? village was the on3y one in which government, *lend* was identified may be explained in terms of the nearness of the village to Zaria.

The absence of government land in the present study may also be due to the effect of distance from Zaria town as such places are outside government administrative area. The six transactions under which customary land tenure practice is made effective in the study area are stated below:

1. Inheritance (gado)
2. Purchase (saya) according to which there is an outright transfer of a piece of land for cash. Two or more witnesses are present and the village head is informed.
3. Loan (aro). Land is lent without cash payment for a given number of years usually two years in m-?ny cases.

Ix. Hire (haya). Land is given for farming and for a well defined period usually one farming season. It. is for the payment of a token amount.

5. Gift (kyauta). This is an outright gift generally between relatives.

6. Pledge (jingina). A piece of land is given to an occupant for a desired amount of money for at least one farming season. The land reverts to the owner after he refunds the amount.

It is to be emphasised that the importance which was generally given to the village heads in land affairs, in the study area can be seen as being indicative of their position as representative of the traditional land owner, the Emir. This is in consonance with Norman's (1974) observation.

Table 4.1 shows the types of customary transactions through which land ownership/occupance was secured in the study area.

Table 4.1: Forms of Land Acquisition

Year	Inheritance	%	Purchase	%	Loan	%	Hire	%	Gift	%	Pledge	%	Total	%
1960	61	35.06	8	4.59	10	5.75	6	3.45	44	25.29	45	25.86	174	100
1965	62	31.63	7	3.57	38	19.39	14	7.14	55	28.06	20	10.20	196	100
1970	76	31.15	20	8.20	33	13.52	35	14.34	61	25.00	19	7.79	244	100
1975	81	31.89	42	16.54	30	11.81	23	9.05	55	21.65	23	9.06	254	100
1980	73	27.14	84	31.23	21	7.81	17	6.32	38	14.12	36	13.38	269	100
Total	353	31.05	161.	14.16	132	11.61	95	8.35	253	22.25	143	12.58	1137	100

Source: Field Survey, 1980

Note: Figures under each column represent the number of responses showing the transactions under which land was owned or occupied during the years shown.

From the description in pages 93-94, it becomes clear that in the cases of loan, hire and pledge, land occupancy is temporary. The lack of security in these cases seriously discourages capital investment in land improvements. Luning (1965) noted that where occupancy was based on loan and pledge, the temporary cultivator would not be inclined to manure the field. If he did, Luning continued, it would imply that he was establishing a claim on the land and the owner would refuse to continue the contract for another year. Thus only in cases such as inheritance, purchase and gift, where land occupancy is permanent, can the cultivator be expected to invest in land development.

At this stage, the information in Table 4.1 will be examined in an attempt to find out what was the nature of land tenure before the commercialisation of agriculture in the area and what possible impact the commercial extension has on the tenurial system.

Relying on documentary sources and on the data in Figs. 11, 12, 13, and 14 the evolution of yam cultivation was found to have gone through three stages

(Chapter 6). The stages and their probable periods are stated below:

i) Preliminary stage: Middle 1940s through the 1950s

ii) Pre-commercial Stage: Late 1950s through the 1960s

iii) Commercial state: Set in 1970 and reached a crescendo in 1975 and has been rising ever since.

The periods shown in Table 4.1 cover the pre-commercial and the commercial stages of the yam evolution. The rate of expansion of yam cultivation was slow and gradual during the former stage and high during the latter stage (Fig. 11). During the pre pre-commercial period in the area (1960 - 1965), the figures recorded for the same period in Table 4.1 under 'purchase' are relatively low. This suggests that the land tenure system was less individualised. Land transactions involving no monetary outlay like inheritance and gift were more frequent, while the majority of those involving money i.e. purchase and hire were less frequent. Only in the case of pledge was a figure as high as 45 or about 26% recorded. The absence of money in most land transactions might have been due to the fact that agriculture was largely subsistence and not commercial (Chapter 6).

1970 may be seen as the water-divide in the entire period covered in Table 4.1. The first part, which has just been discussed, corresponds with the pre-commercial stage of yam evolution while the second (1970, 1975, 1980) corresponds with the commercial stage. Only in the case of 'purchase' do the figures record a steep rise during the commercial period. In the cases of loan, hire and gift, the figures show marked decline. This suggests that land owners were less willing to part with their land through these transactions. They would rather cultivate the land as they would earn more money through commercial agriculture. The decline under 'inheritance' in 1980 may be due to the increased individualised tenure as shown in the highest figure of 84 or about 31% under "purchase" for the same year (1980). Moreover, fragmentation of holding resulting from the sharing of land to heirs (Rowling, 1949; Luning, 1963) may render inherited holdings uneconomical for commercial agricuture.

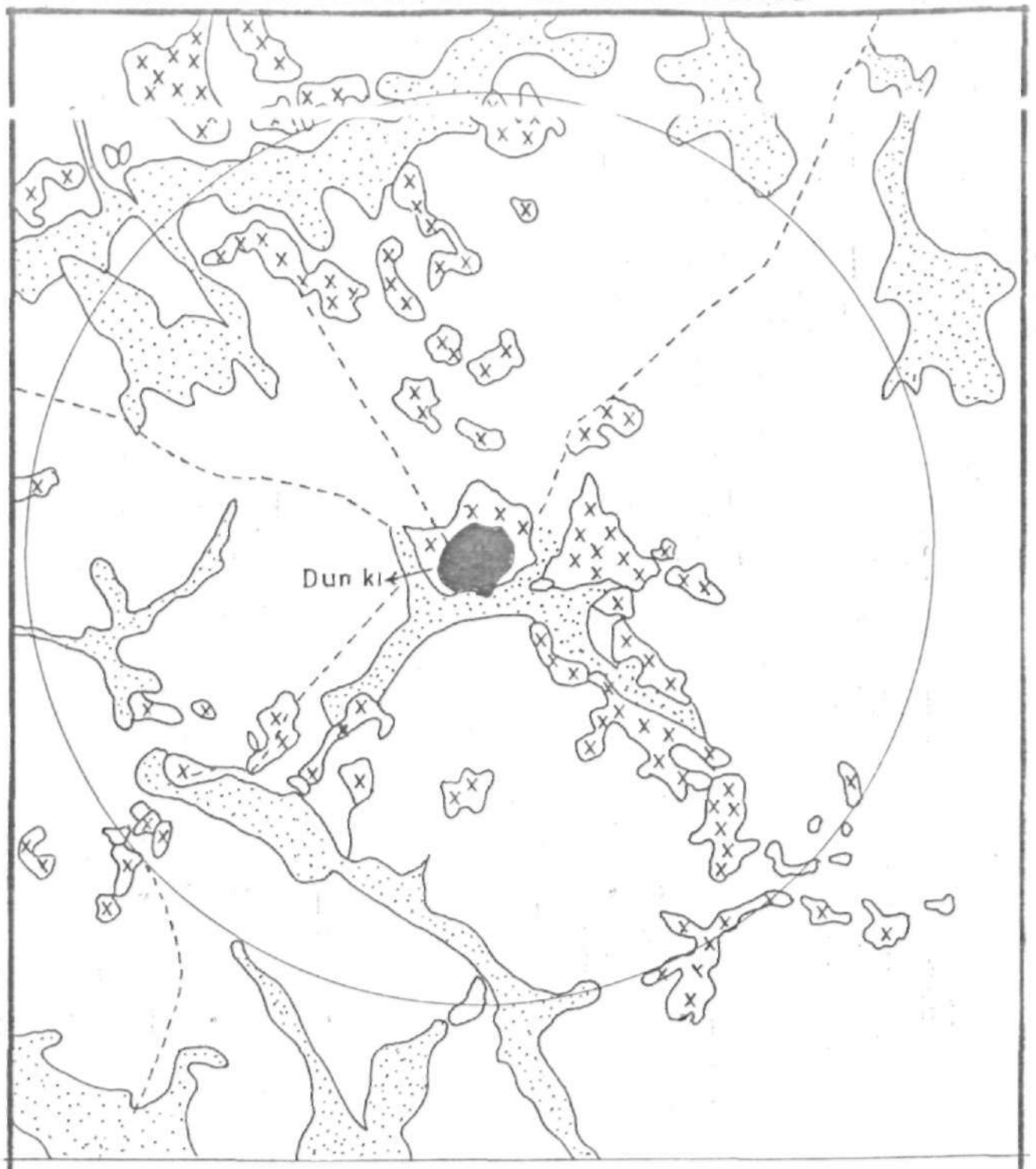
Thus before the commercialisation of agriculture (1960 - 1965), most land transactions (i.e. those under inheritance and gift) were those with no monetary

involvement. The tenure system was also less individualised. Under the impact of commercial agriculture, there appeared to be an increase in land deals involving outright sales (purchase). Moreover, landowners seem to prefer to cultivate their holding under commercial opportunities instead of parting with land through transactions like loan and hire.

4.4 Changes in Agricultural Land Use

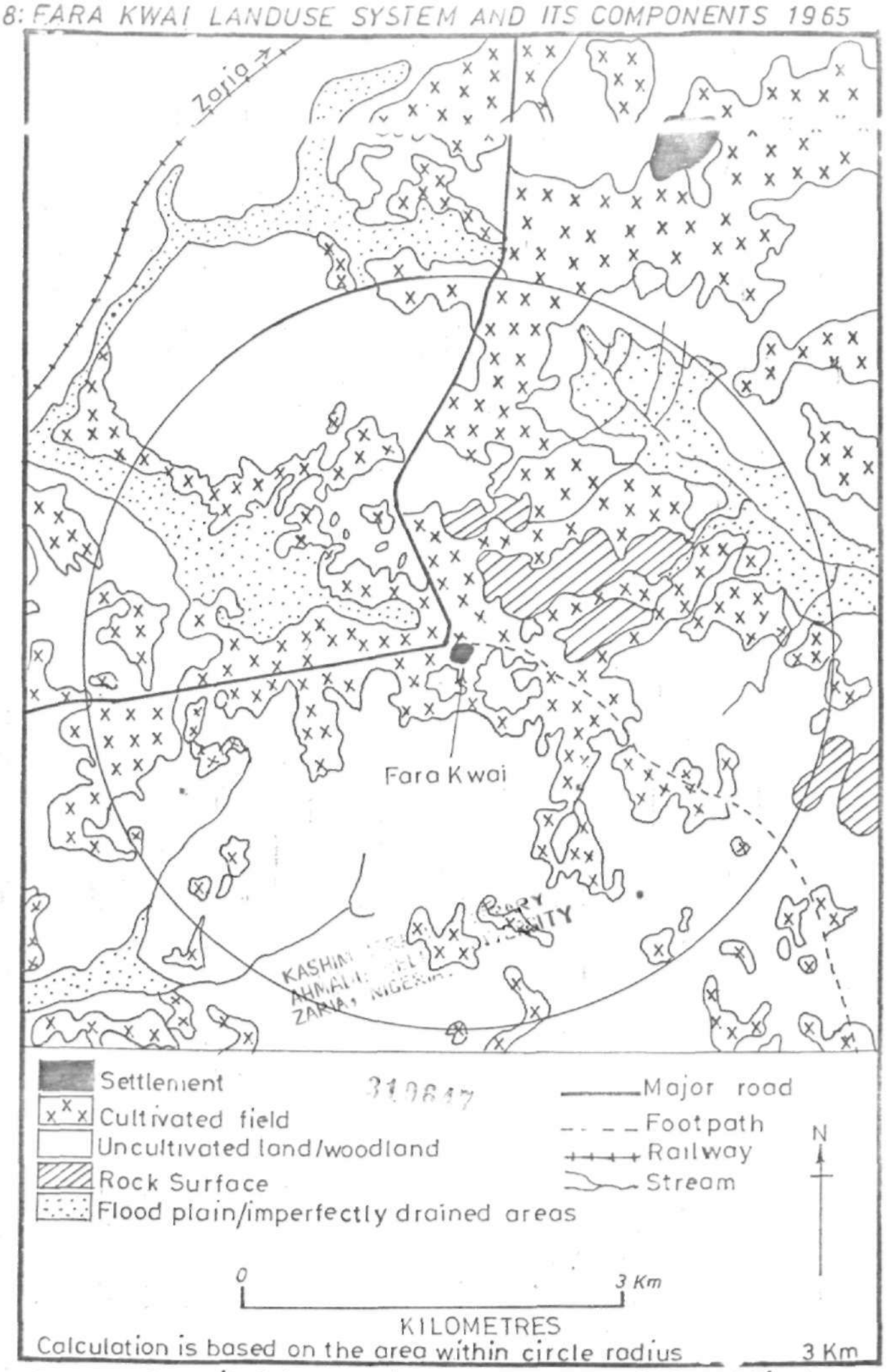
With the aid of two runs of aerial photographs, it was possible to assess changes in landuse practice within both temporal and spatial dimensions. Figs, 7 8 and 9 were compiled from field survey and aerial photographs taken in 1965 and covering the villages of Dunki, Fara Kwai and Igabi respectively. From the centre of each village, a circle radius 3km was drawn to demarcate the area of analyses. The choice of 3km radius was consequent upon an important observation . From figs 7, 8 and 9, it becomes evident that the intensity of cultivation diminishes significantly beyond 3km from the centre of each settlement.

Fig. 7, DUNKI: LAND USE SYSTEM AND ITS COMPONENTS 1965



Source;-Compiled from aerial photographs, 1965 and Field Survey. 1980.

FIG. 8: FARA KWAI LANDUSE SYSTEM AND ITS COMPONENTS 1965



Source:- Compiled from aerial photographs, 1965 and Field Survey 1980.

FIG. 9 : IGABI LANDUSE SYSTEM AND ITS COMPONENTS 1965



Source : Same as fig-8

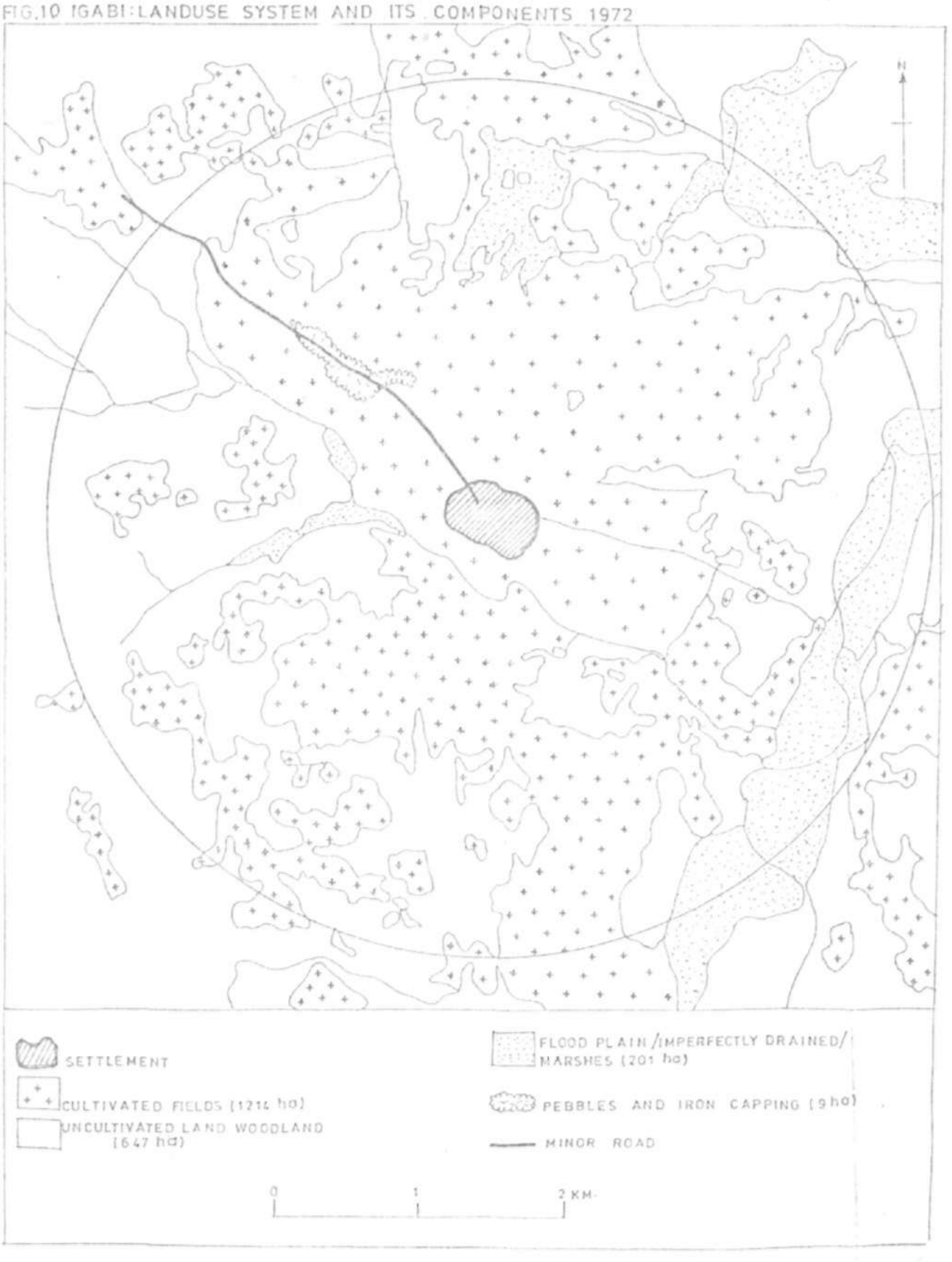
Unlike Fig 9, Figs 7 and 8 have no corresponding figures for 1972 due to the difficulty of procurring the relevant aerial photographs during the period that this project covered. Table 4.2 shows the sizes of the various land components in the two centres represented in Figs. 7 and 8.

Table 4.2: Sizes of Land Components in Dunki and Fara Kwai in 1965 in ha.

Land Components	Dunki	% Total	Fara Kwai	% Total
Cultivated field	202	8.07	684	7.58
Uncultivated field	2029	81.10	8004	88.71
Rock surfaces	-	-	72	0.80
Flood plain and imperfectly drained areas	271	10.83	263	2.91
Total	2502	100.00	9023	100.00

Source: Compiled from field survey and aerial photographs taken in 1965 (Figs. 7 and 8).

FIG.10 IGABI: LANDUSE SYSTEM AND ITS COMPONENTS 1972



Only in respect of Igabi were aerial photographs taken in 1972 available for comparison. A close examination of Figs. 9 and 10 will reveal that between 1965 and 1972, there was appreciable expansion in the area of land brought under agriculture. Table 4.3 shows the changes in landuse system in detail.

Table 4.3: Landuse Changes in Igabi Village Between 1965 and 1972

Components	Area in 1965* (in ha.)	Area in 1972 (in ha.)	Changes between 1965-72 (in ha.)	% Change
Cultivated fields	488	1214	726	149
Uncultivated fields, wood-land	1294	647	647	-50
Flood plain, imperfectly drained areas	288	201	87	-30
Pebbles, iron Capping	-	9	-	-

*Figures in these columns were used to calculate the % change.

Source: Field Survey, 1983

The absence of an area covered by pebbles and iron capping in the 1965 aerial photograph appears to be due to the scale of 1:40,000 which tended to conceal some land features in the area. The scale of 1:25,000 used for the 1972 aerial photograph (Fig.10) appears big enough to show the terrain features in greater and clearer details.

The cultivated area had increased from 488 hectares in 1965 to 1214 hectares in 1972. This represents an increase of 149%. Within the same period, uncultivated fields and woodland had reduced by 50% under the impact of expanding cultivation. The expansion of farms into flood plains and poorly drained areas had also added 87 hectares into the cultivated fields. The actual land area brought under agriculture between 1965 and 1972 was 726 hectares of which 87 hectares were accounted for by the expansion of cultivated fields into flood plains, (Table 4.3). The average of 10.2 hectares per year may not appear high enough to justify the commercialised scale of agriculture in the area. But when it is

remembered that the Nigerian Civil War (1966-1970) and its probable adverse effect on general economic activities, fell within the period in question; and that much of the expansion might have occurred between 1970 and 1972, after the civil war, then the scale of the increase may be better appreciated.

However, the above expansion relates to the whole spectrum of agricultural practice in the area. In the next stage of the analysis, attempt is made to ascertain the aspect of the agricultural expansion which rightly belongs to yam and other commercial crops. This approach is adopted to enable this project address itself to the first two of its stated objectives namely; to account for the evolution of yam production in the Zaria area in the last two decades; and to examine the impact of the evolution on other cash crops in the area.

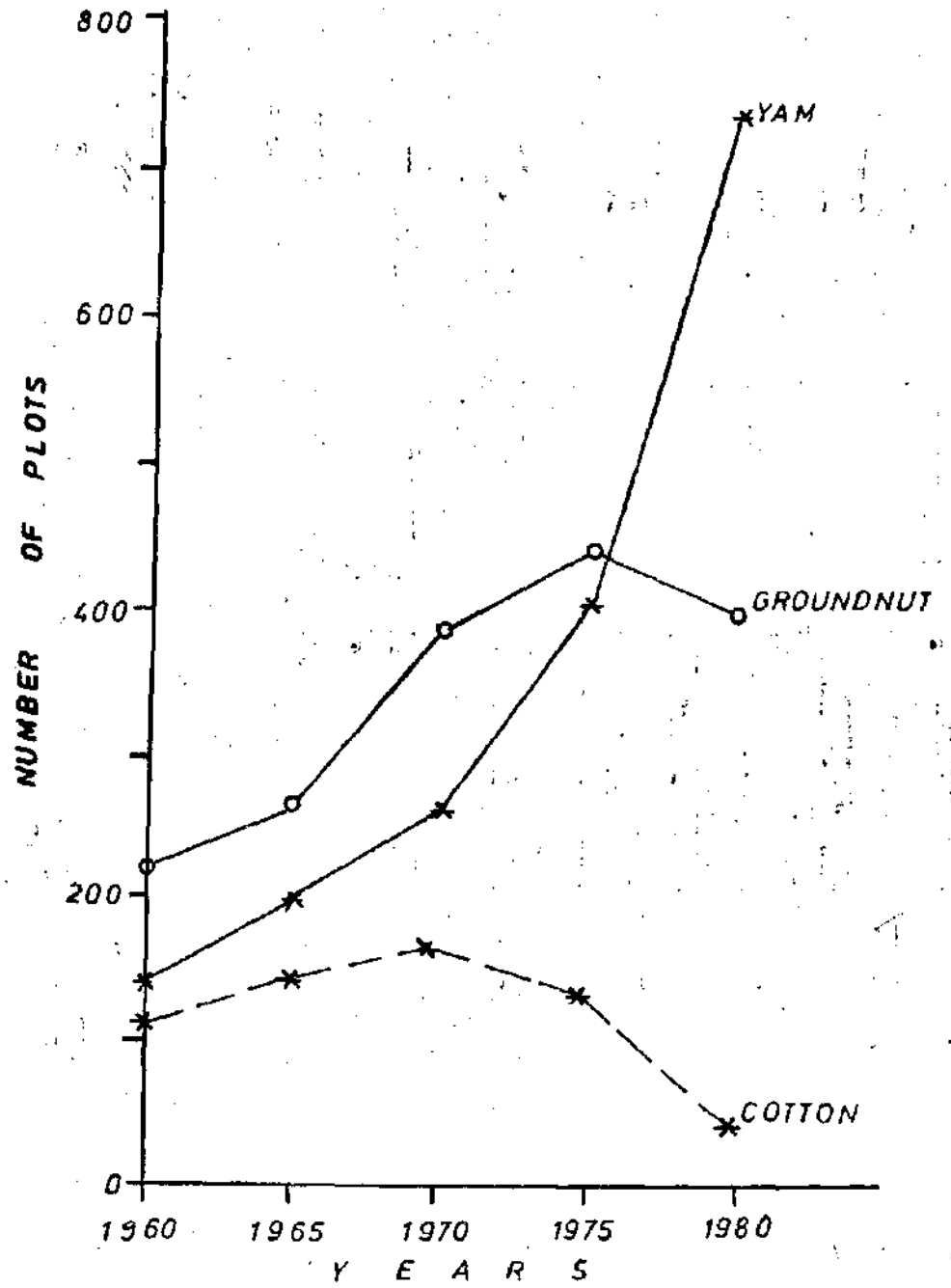
The two other commercial crops which were listed for this study are cotton and groundnut. The crops are produced alongside yams in the study area and the

interest of analyses lies in the economy of landuse which emerges as the three crops compete for arable land space. And it is safe to assume that given the enterprise and responsiveness of the farmer, the success or failure of any of the crops to occupy more arable space at the expense of the others will be determined first and foremost by the size of net revenue which accrues to the farmer from each crop.

Effort was made in the farmers' questionnaire (Appendix 1) to examine changes which have occurred in respect of individual crops over space and time. The temporal aspect was spread over five periods within two decades, 1960 to 1980. The spatial dimension was based on the number of plots under each crop. Fig. 11 shows the order of change for each crop during the years shown and for the three rural centres. The figures derived were in response to the question, "How many plots of yam had you during the following period.....?" (Appendix I). The same question was administered to collect similar data in respect of cotton and groundnut.

FIG.11

CHANGES IN THE NUMBER OF PLOTS UNDER THE CULTIVATION OF YAM, COTTON AND GROUNDNUT IN IGABI FARA KWAI AND DUNKI 1960 – 1980



It is important to point out that respondents were not asked the sizes in hectares of the respective crops they cultivated during the periods. This was due to the fear that the generalisation that might arise from the lack of a correct impression of sizes especially in cases dealing with the distant past could lead to inaccurate responses. This fear became apparent during interviews the researcher had before the administration of the questionnaires. It was found easier for the farmer to remember the number of plots he had in a given year than to remember the sizes of all his plots put together in respect of each crop.

However, attempt was made to measure 30 plots of yam with the aim of using the average size (coefficient of variation 17%) as a constant with which the plot numbers could be converted to actual sizes. But since it was difficult to get a base data such as a tax list from which to select the respondents, the village heads were requested to give the names of subjects whose farms were measured. Moreover, since this method of selection was considered subjective, the use of the measured plots for the conversion exercise was abandoned. The use of plot numbers in this analys s thus imposes a limitation which the use of actual sizes might have taken care of.

FIG·12

CHANGES IN THE NUMBER OF PLOTS UNDER THE CULTIVATION OF YAM, COTTON AND GROUNDNUT IN IGABI VILLAGE 1960–1980

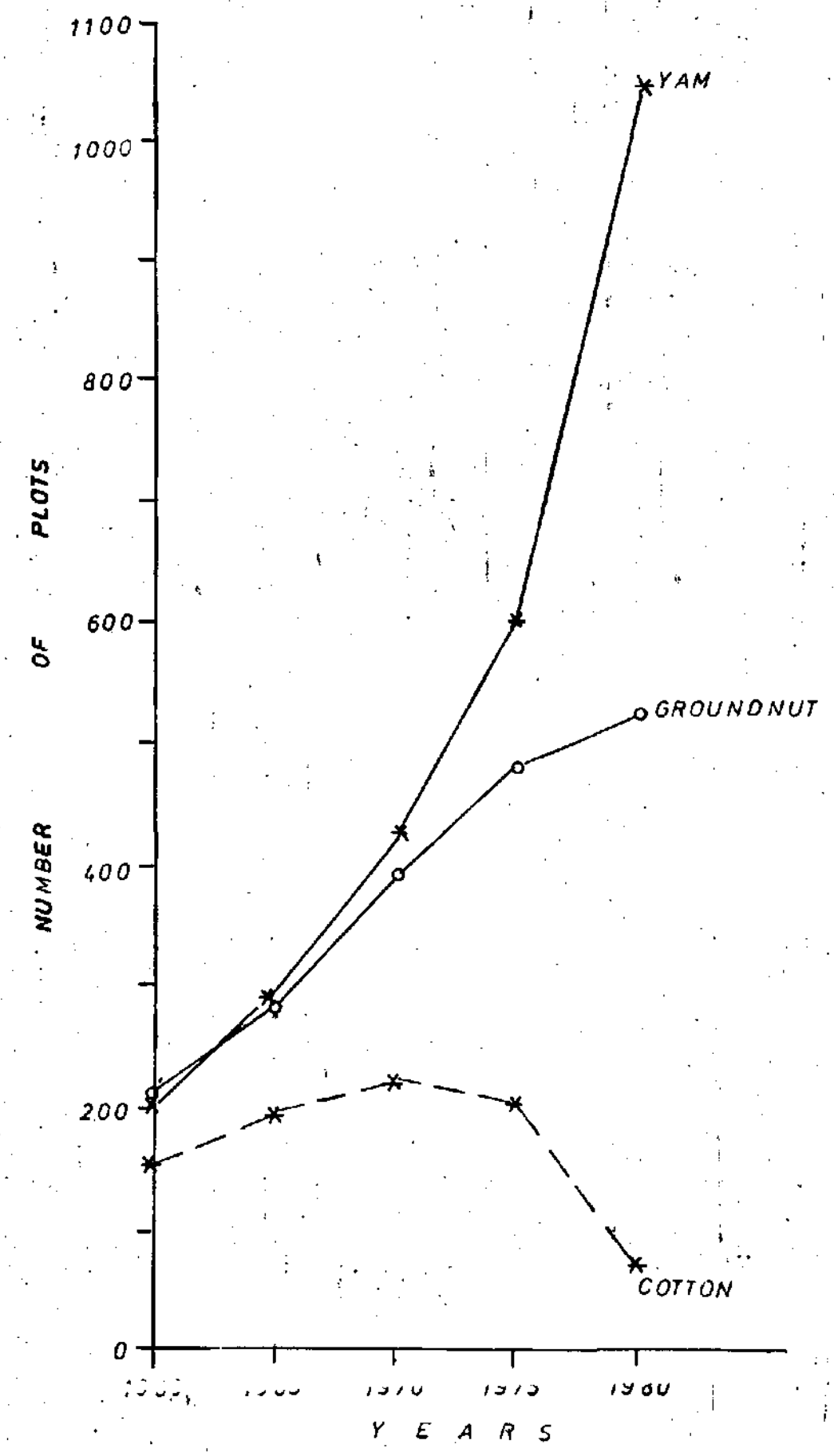
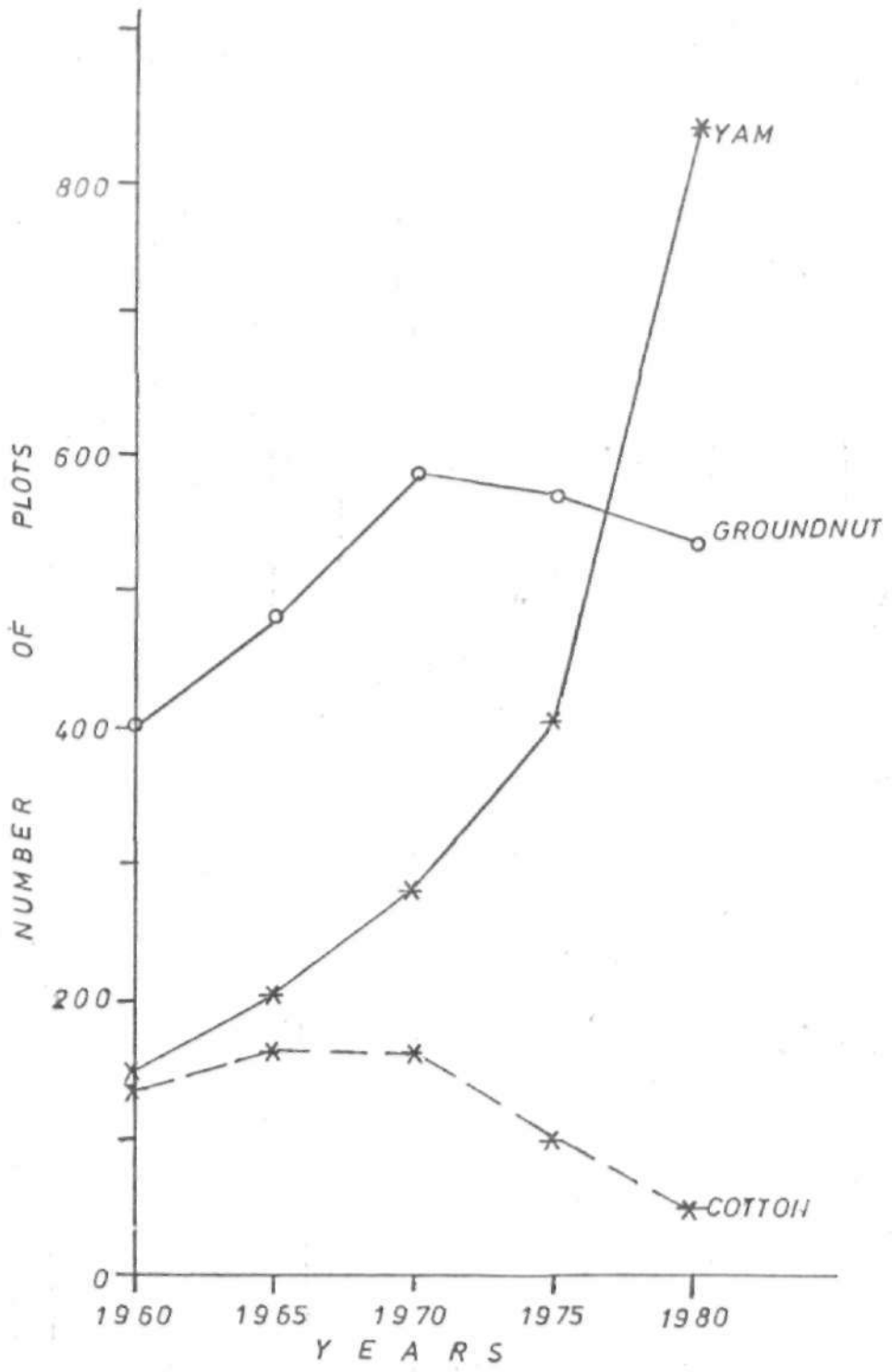


FIG.13

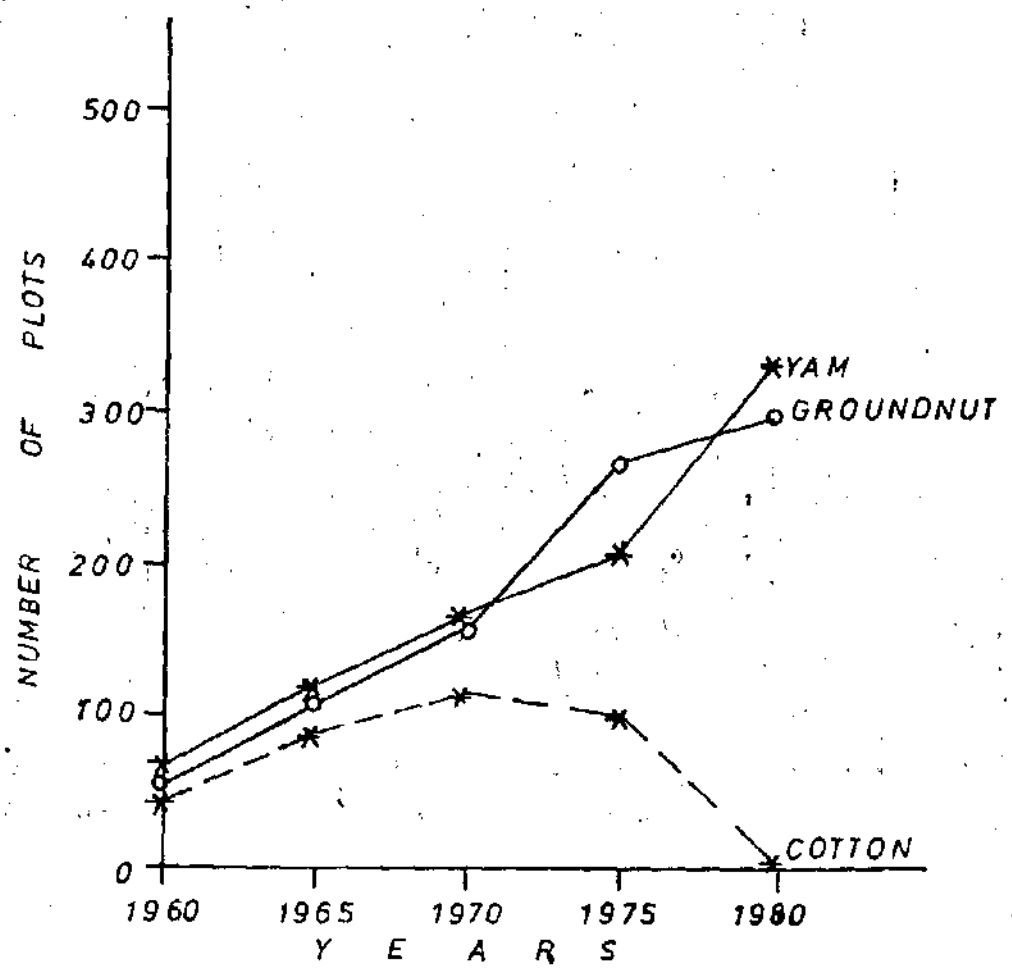
CHANGES IN THE NUMBER OF PLOTS UNDER THE CULTIVATION OF YAM, COTTON AND GROUNDNUT IN FARA KWAI VILLAGE 1960-1980



SOURCE :- FIELD SURVEY 1980

FIG. 14

CHANGES IN THE NUMBER OF PLOTS UNDER THE CULTIVATION OF YAM, COTTON, AND GROUNDNUT IN DIMKI VILLAGE 1960-1980



SOURCE:- FIELD SURVEY 1980

4.5 The Impact of Yam Cultivation On Other Traditional Cash Crops

Fig. 11 provides a useful starting point in the assessment of the above impact. The groundnut curve rises from 1960 to 1975. Thereafter, a decline is encountered from 1975 to 1980. The cotton curve rises only gently up to 1970. Between 1970 and 1975, it declines becoming steeper between 1975 and 1980. Only in the case of yam production is there no decline throughout the period under assessment. And whereas the curve rises steadily during the 1960 - 1970 decade, it records a steep rise from 1970 with the slope becoming steeper between 1975 and 1980.

More discussion on the decline of the other crops (cotton and groundnut) will follow presently; but before then, the performance of all three crops in each centre will be examined. This approach will help to show the extent to which the trend in fig. 11 is confirmed. It will also be useful in revealing details in individual centre which the average data in Fig. 11 might conceal.

The graphs which represent the position in each village were also based on the number of plots under the cultivation of each crop. The graphs

in respect of Igabi, Fara Kwai and Dunki are shown in Figs. 12, 13 and 14 respectively.

In Figs. 12 and 14, the cotton curves record a gradual rise between 1960 and 1970. A decline set in 1970 becoming steeper between 1975 and 1980. This trend thus confirms the position in Fig. 11. In Fig. 13 the cotton curve records a decline between 1970 and 1980. It levelled up between 1965 and 1970 but records a gradual rise only between 1960 and 1965.

Again in Figs. 12 and 14, the groundnut curves rise throughout the period but record a slight decline between 1975 and 1980, again confirming the trend in Fig. 11. However, in Fig. 13, 1970 stands out as a divide marking the end in the rise of the curve and the beginning of a gradual decline which persists to 1980.

The direction in the cultivation of yam seems to present a different picture in the analyses. In Fig. 12, 13 and 14, the yam curves rise steadily between 1960 and 1970. The curves steepen between 1970 and 1975 and assume a dramatic surge from 1975 to 1980 as it is shown in Fig. 11. This rise appears to be more dramatic in Figs. 12 and 13. In Fig. 14, the general performance of the yam curve appears to be relatively modest. This is perhaps due to the remoteness of Dunki from the Zaria - Kaduna highway and from allied roadside markets and urban buyers.

Based on the foregoing analyses therefore, the relationship between the plots under the cultivation of the three crops may be assessed. Before 1970, there appears to be a weak positive relationship between yam and groundnut plots in all centres. A weak inverse relationship seems to surface in 1970, becoming stronger between 1975 and 1980. The positive relationship between yam and cotton plots does not seem to go beyond 1965. Thereafter, it takes an inverse turn which appears weak between 1965 and 1970 and stronger from 1975 and 1980.

Thus while the inverse relationship between yam and groundnut plots occurs between 1975 and 1980, it is from 1970 to 1980 that a similar relationship occurs between yam and cotton plots. It may be claimed on the basis of the above relationships that the impact of yam cultivation led to the decline in groundnut cultivation from 1970 to 1980; and a decline on cotton cultivation from around 1965 to 1980. But it may also be contended that it is the decline in the cultivation of cotton and groundnut which has led to the increase in yam cultivation. This implies that the impact in question may be exercised by yam plots on those of cotton and groundnut or vice versa.

4.6 Patterns of Income and Expenditure in the Production of Yam and Other Traditional Crops

As this study now returns to more discussion on the decline of cotton and groundnut, attention shifts to the pattern of income and expenditure in the production of all three crops. This is in attempt to ascertain the relationship suggested above and the statistics for this exercise are contained in Tables 4.4; 4.5 and 4.6 dealing with yam, cotton and groundnut respectively.

Table 4.4: Pattern of Income and Expenditure from Yam Cultivation per ha. 1983

Activities and Inputs	Description[1]	Cost (in ₦)
Ridge construction	74.10mandays	370.50
Yam seed	-	370.50
4.9 bags of Fertilizer[2]	-	10.96
Fertilizer application	2.70mandays	12.45
Dressing and Maintenance of ridges3	24.70mandays	123.50
Harvesting	37.00 mandays	185.30
Total expenditure	138.5 mandays	1,073.21
Sale of Yam	14,820 kg	3,705.00
Net revenue	₦(3,705-1073.21)	2,631.79

Notes: 1. One Manday = eight hours at ₦5.00

2. Normal cost of fertilizer per bag was ₦12.00 but it was sold to farmers at a highly subsidised price of ₦2.20 per bag. In the case of yam, mixture, i.e. a mixture of phosphorus (super phosphate) and nitrogen (urea) was used.

3. Dressing involves weeding while the maintenance is concerned with filling up and remoulding of ridges.

4. The figure of 14820kg, represents the average output of yam per ha. Yam does not require spraying except during outbreak of disease or pests.

Source: Field Interview with the Chief Technical Officer, Kaduna State Integrated Rural Development Project, Maigana January, 1983.

Table 4.5: Pattern of Income and Expenditure from Cotton Cultivation per ha. of Land 1983

Activities and Input	Description[1]	Cost (in ₦)
Land preparation	24.70mandays	123.50
Seed	Distributed free	-
4.9 bags of Super/phosphate	₦1.80 per bag[2]	8.82
Planting	14.80mandays	74.00
First weeding	14.80mandays	74.00
7.4 bags of CAN Fertilizer[3]	₦1.80 per bag	13.32
Fertilizer Application	2.47 mandays	12.35
Second weeding	14.80mandays	74.00
4.9 litres CYMBUSH Chemical	₦5 per litre	24.50
Spraying of chemical	2.47 mandays	12.35
Harvesting two times	39.52: 19.76 each	97.61
Total expenditure	-	514.45
Sale of cotton	741 kg[4] at 45k per kg.	333.45
Net revenue	₦(333.45-514.45)	-181.00

1. Same as in Table 4.4
2. Subsidised price
3. CAN = Calcium Ammonium Nitrate
4. 741 kg. represents average output of cotton per ha.

Source: Same as in Table 4.4

Table 4.6: Pattern of Income and Expenditure from the Cultivation of Groundnut per ha. 1983

Activities and Inputs	Description[1]	Cost (in ₦)
Land preparation	12.4 mandays	61.75
Seed	2.5 bags[2]	39.52
Planting	7.4 mandays	37.05
5 bags, super phosphate	₦1.80 per bag	9.00
Fertilizer application	2.5 mandays	12.50
Weeding: 2 times	30 mandays, 15 each	150.00
5 litres, pirimor chemical	₦5 per litre	25.00
Spraying of chemical	2.5 mandays	12.50
Harvesting:		
Lifting	24.7 mandays	123.50
Packing and bagging	14.8 woman days[3]	74.10
Shelling	15 bags at ₦4 each	60.00
Total expenditure	-	604.92
Sale of nuts	15 bags[4] at ₦16 each	240.00
Net revenue	₦240-604.92)	-364.92

Notes:
1. Same as in Table 4.4
2. During the years 1980, 1981, and 1982, the Groundnut Board launched a scheme which was administered by the Kaduna State Integrated Rural Development Project, Maigana. Under the Scheme, the Board provided the seed which was distributed by the Project to the farmers. The number of bags given to a farmer was to be refunded by the farmer after harvesting. As farmers made no refunds during the period, the distribution was discontinued and farmers were made to pay the normal price of ₦16 per bag for seed.

3. Picking and bagging of nuts was reported to be the job for women folks and the daily wage of ₦5 payable to men is also payable to women.

4. 15 bags of groundnut represents the average output per ha.

Source: Same as in Table 4.4

Table 4.7 summaries the expenditure and revenue, position of the respective crops. It also spotlights the relative benefits or otherwise which the farmer receives from the cultivation of each crop.

Table 4.7: Expenditure on and Revenue from the Cultivation of Yam, Cotton, and Groundnut per ha. 1983

Crops	Cost of Production in ₦	Revenue from Sales (in ₦)	Net Income or loss (in ₦)
Yam	1073.21	3705.00	2631.79
Cotton	514.45	333.45	-181.00
Groundnut	604.92	240.00	-364.92

Source: Derived from Tables 4.4; 4.5; and 4.6

If shelling is considered optional and the cost of ₦60 removed, the net loss for the cultivation of groundnut reduces to - ₦304.92.

The net income or loss column shows that it pays the farmer much more to cultivate yam which gives him net revenue of ₦2631.79 per ha. By contrast he loses ₦181.00 per ha. and ₦364.92 or ₦304.92 (if the cost of

shelling nuts is removed) in the cultivation of cotton and groundnut respectively. In more specific terms, the following differential requirements may be noted in the cultivation of all three crops. The cost of purchasing and spraying chemicals is not applicable to yam as no chemical is required by yam except during times like the outbreak of disease or pests. Thus whereas spraying of chemicals constitutes part of the total expenditure in respect of cotton and groundnut cultivation, the expenditure is not applicable in the case of yam.

Moreover, whereas the cost of labour for weeding twice is about ₦150 in the cases of cotton and groundnut cultivation, the cost of dressing and maintenance of yam ridges which incorporates weeding is ₦123.5.

However, since the information in Tables 4.4; 4.5; 4.6 is based on recommended practices, it may not be taken without caution. But as the same recommended practices were derived from records of the farmers' experience and performance, the information can be accepted as indicative of the level of cash which the farmer receives for growing the respective crops. This also implies that the rural producer may eliminate partially or totally, some inputs and

activities like the purchase and spraying of chemicals in order to cut down expenditure. Besides, he may apply free family labour if available if he so desires, to reduce the cost of labour monetarily. However, these options do not seem to hold any attraction for the farmer who knows that rising market price movement is in favour of yam products and that he will realise more income if he redirects these resources towards the cultivation of yam. Favourable price movement operating within the context of price mechanism then appears to be the force behind the change which the rural producer makes in his agricultural production in the study area. The change seems to explain the evolution in the increasing cultivation of yam vis-a-vis the relative decline in the area of land under the cultivation of cotton and groundnut. However, while a discussion on price mechanism is dealt with in the next chapter, the remaining part of this chapter attempts to assess the validity of the data in Tables 4.4; 4.5 and 4.6.

The information in Table 4.8 covers the whole of Kaduna State and represents average figures which tend to conceal the fundamental differences between individual localities. However, since the average data indicate the mean direction of movement in the cultivation of each crop, they will be useful for the

assessment of the data on the expenditure and income of these crops.

Table 4.8: Farmers Growing Particular Crops as Percentage of Total in Kaduna State

Crops	1968/69	1969/70	1970/71
Yam	4	5	10
Cotton	29	37	36
Groundnut	75	67	64

Source: North Central State of Nigeria Statistical Year Book 1972; p. 101

According to the above table, cotton records a rise only in 1969/70 and declines in 1970/71. While the percentage of groundnut falls throughout the period, only in respect of yam does it rise throughout the period. Further references will be made to other sources of information in the assessment exercise.

Table 4.9: Tonnage of Crops Inspected by the Produce Inspection Division, Zaria 1982.

Years	Cotton	Groundnut
1970	32600	8502
1971	2370	2370
1972	2540	9559
1973	15498	15742
1974	3847	250
1975	4881	-
1976	9758	-
1977	4975	-
1978	4975	-
1979	9883	-
1980	5194	-
1981	5545	14
1982	-	2.6

Source: Divisional Produce Officer, Zaria Area
Produce Inspection Division, Zaria

According to Table 4.9, there was a sharp fall in the tonnage of groundnut handled by the Produce Inspection Division in 1974 with virtually nothing between 1975 and 1980. The reason for this situation may be due to the effect of drought and rosette disease which wiped out

the crop in 1975 (Mortimore, 1978). Moreover, since according to the produce officer, the sale of nuts was not confined to official buying stations, farmers may have sold nuts elsewhere such as the local markets, if they had any. This was highly probable as prices in the markets were higher than Marketing Board purchases since 1970 (Mortimore, Ibid.).

Cotton, according to Table 4.9 was handled throughout the period except 1982; and although there is wide flunctuation in the tonnage inspected, the average monthly figure after 1973 is low compared with 1970 and 1973 figures. In the movement of both crops, the evidence of decline is shown.

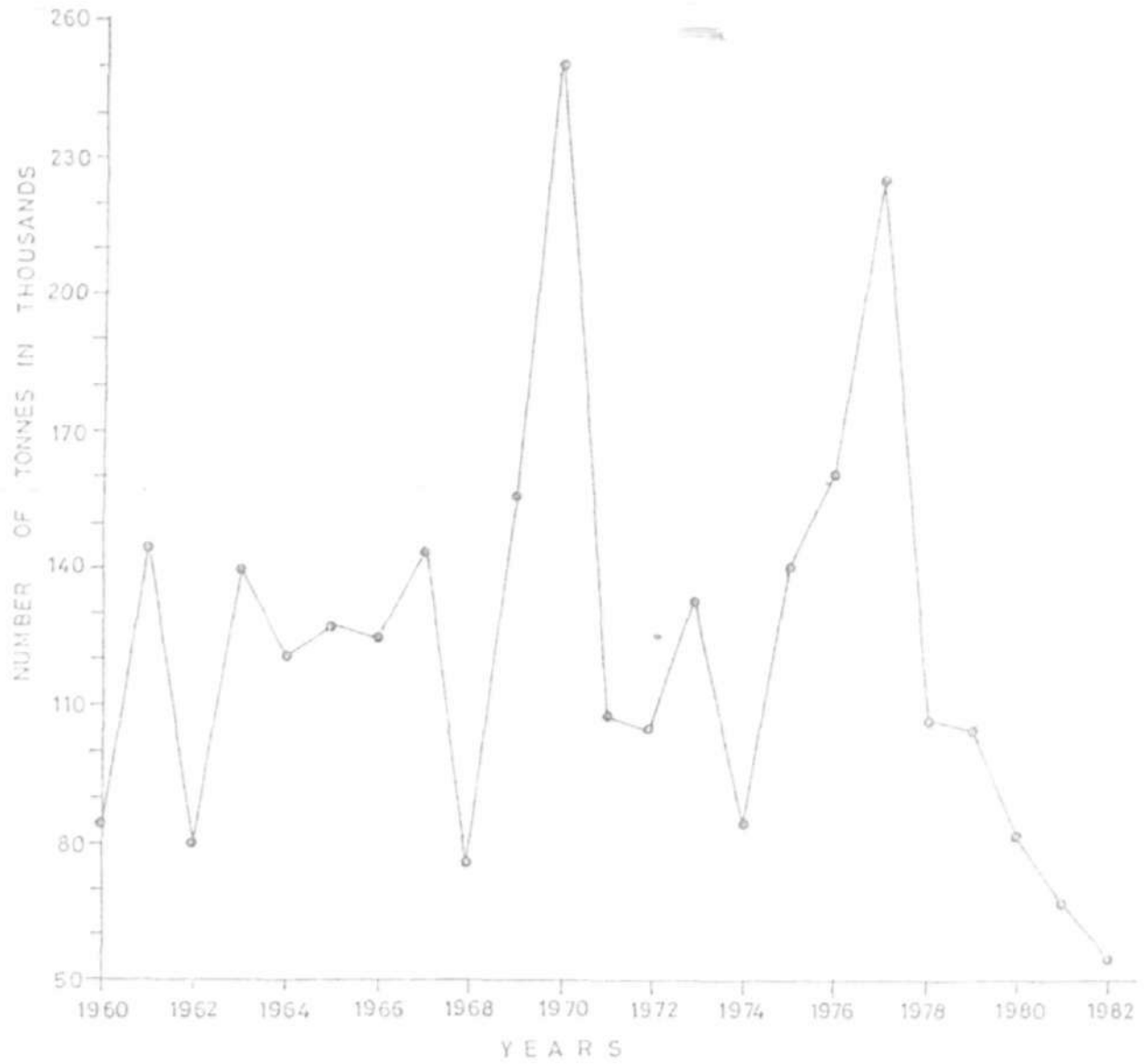
The Cotton and Agricultural Processors is the only plant which processes raw cotton grown in Nigeria. After the extraction of cotton seeds, cotton lint is packed in bales: two bales of lint being equivalent to one tonne of raw cotton. In Fig. 15, 1970 and 1977 are shown to be peak years when the amount of processed lint reached about 251,000 tonnes and 226,000 tonnes respectively. Fig. 15 further shows that before 1977 there was fluctuation in the level of production and after that date the decline has

persisted throughout the remaining period. As the quantity of lint delivered for processing determines the level of production, the information in Fig. 15 indicates the national trend in the cultivation of the crop. But while this is the picture on the national scene, there is nothing to suggest that the pattern is otherwise in the Zaria area where Mortimore (1970,P.114) has observed that "cotton is rarely seen close to Zaria but it is much more common on recently fallowed fields".

Advancing reason for the relative decline in the cultivation of cotton in Kano, and relying on information from the Kano Experimental Farm and the Institute for Agricultural Research, Samaru, Hogendorn (1970,P. 36) remarked that "..... cotton requires more labour time and effort, cotton needs deeper cultivation, more intensive weeding and several more pickings compared to groundnuts". As for groundnut, its decline is claimed to have necessitated the importation of 20,000 tonnes of nuts by the Nigerian Oil Mill, Kano in March, 1984 (New Nigerian, 12 June 1984). The Mill had experienced a drastic fall in its turn-over from about 75 million naira the previous year to only 3 million naira the following financial year, according to the source.

Judging from the general decline of both crops shown in tables 4.8, 4.9, and Fig. 15 and

FIG. 15 : PROCESSING OF COTTON LINT BY THE COTTON & AGRICULTURAL PROCESSOR LTD. ZARIA FROM 1960 TO 1982



SOURCE: COTTON AND AGRICULTURAL PROCESSORS LTD. ZARIA 1983 (TABLE 4.15)

supported by the documentary evidence above, the data on the expenditure and income of yam, cotton and groundnut (Tables 4.4, 4.5 and 4.6)seem confirmed. This also appears to explain the increased area under yam cultivation vis-a-vis the relative decline in area under cotton and groundnut. The process of crop substitution would have been well under way.

At this stage, this project will pause to attend to a further but brief discussion on price mechanism with focus on price relationship. The price movements of the crops in question (yam, cotton, groundnut) as they relate to one another will be examined in order to see if any of them explains what appears to be a growing dominance of yam cultivation in the area. This discussion is conducted in the next chapter.

CHAPTER FIVE

THE AGRICULTURAL MARKETING SYSTEM

5.1 Introduction

Price mechanism is further discussed in this Chapter but this time with emphasis on relative profitability. Underlying the comparative price analyses of the major cash crops in the study area, is the importance of price relationship. And on the basis of this importance, a functional relationship between prices and some other variables is proposed and discussed. An appropriate unit used for the sales of yam is considered. Based on the unit, the spatio-temporal patterns of yam prices, is examined. Finally, the types of marketing organisation of the major cash crops with particular reference to traditional marketing organisation and marketing Board organisation is analysed.

5.2 Price Mechanism

The importance of price in determining the allocation of agricultural resources and therefore the pattern of agricultural production was stressed earlier in Chapter One of this thesis. The view according to Mellor (1966), that the relative profitability is a function of the relationship

among prices of inputs and outputs was also alluded to. Tiffen (1976) subscribes to the general importance of price in terms of this relationship when she observes that "..... price affects farming policies, both by determining the choice between different crops and by determining the rate of profit, saving and investment". Therefore, it is price relationship rather than the absolute level of prices which is important as far as the inducement of more agricultural production is concerned (F.A.O., 1967).

This conceptual view may then be applied to yam, cotton and groundnut that for price of any of them to induce increased production, it has to relate to the cost of inputs, the cost of living in the economy, the price of the other two crops and to savings. The pattern of expenditure and income of the three crops in Tables 4.4, 4.5 and 4.6, suggest that the relative profitability level from the cultivation of yam is the highest. The production of the crop is done within the same physical resource base (Chapter One). The cost of living is also the same since the crops are grown within the same socio-economic system. Saving would depend upon relative profitability occuring from price levels;

and saving will be more, the more stable and higher prices are. And since efficient marketing system often relates very closely to rising prices, the outstanding issues in the price analyses of these crops would appear to be two. These are relative level of the prices of these crops; and the relative efficiency of their marketing systems. The former will be considered under comparative price analyses of these crops and the latter under types of marketing organisation.

5.3 Comparative Price Analyses of Major Cash Crops

According to table 5.1, the average price of seed cotton rose from 8.5 kobo per kilogram during the 1974/75 buying season to 54.5 kobo for the same unit in 1982/83. This represents 541% increase over the 1974/75 rate. Similarly, the percentage increase in respect of groundnut prices between 1970/71 and 1981/82 was 614% (Table 5.2).

Table 5.1: Cotton Board Prices for Seed Cotton in Zaria (in Kobo per Kilogram)

Year	Grade I	Grade II
1974/75	9	8
1975/76	14	13
1976/77	14	13
1977/78	33	31
1978/79	33	31
1979/80	33	31
1980/81	40	37
1981/82	46.5	43.5
1982/83	56	53

Source: Zaria Cotton Board, with the assistance of the Divisional Produce Officer, Produce Inspection Division, Zaria Kaduna State, 1984

Table 5.2: Groundnut Board Price for Groundnut in Zaria (In Naira per Tonne)

Years	Prices
1970/71	63.00
1971/72	67.60
1972/73	80.00
1973/74	94.25
1974/75	165.00
1975/76	250.00
1976/77	250.00
1977/78	275.00
1978/79	290.00
1979/80	350.00
1980/81	420.00
1981/82	450.00
1982/83	450.00
1983/84	450.00

Source: Same as Table 5.1

The view that high prices induce increased agricultural production does not seem to apply in this case. Nevertheless, part of the same view is that relative profitability relates to other factors such as cost of living, cost of other cash crops and savings. Assuming that the data in Tables 5.1 and 5.2 are reliable, the decline in the production of these crops would appear to be due to unfavourable

relationship between their prices and the above related factors, assuming that their marketing system is efficient.

The Assistant General Manager of the Nigerian Cotton Board, Funtua, Mallam Kankia, confirmed that Commodity Board prices for cotton and groundnut have been rising for the past ten years or so inspite of fluctuations in world market prices.

On the basis of the importance of price relationship, it is proposed and hypothesised that:

P = f (I,L,O,S) where f is the function

P = Price

I = Cost of inputs (production)

L = Cost of living

O = Prices of other cash crops

S = Savings

$$P = K(I \times L \times O \times S) \quad \ldots\ldots\ldots \quad (1)$$

where K is a constant whose value is determined by the values of the variables.

$$P = KI \times KL \times KO \times KS$$

$$KI = \frac{P}{K(L \times O \times S)} \quad \ldots\ldots\ldots \quad (2)$$

$$KL = \frac{P}{K(I \times O \times S)} \quad \ldots\ldots\ldots \quad (3)$$

$$KO = \frac{P}{K(I \times L \times S)} \quad \ldots\ldots\ldots \quad (4)$$

$$KS \quad \frac{P}{K(I \times L \times O)} \quad \ldots\ldots\ldots \quad (5)$$

substituting in (2), (3), (4) and (5) for KI, KL, KO, and KS.

$$P = \frac{P}{K(LxOxS)} \times \frac{P}{K(IxOxS)} \times \frac{P}{K(IxLxS)} \times \frac{P}{K(IxLxO)}$$

Substituting in (1) for P

$$P = \frac{K(IxLxOxS)}{K(LxOxS)} \times \frac{K(IxLxOxS)}{K(IxOxS)} \times \frac{K(IxLxOxS)}{K(IxLxS)} \times \frac{K(IxLxOxS)}{K(IxLxO)}$$

$$P = I \times L \times O \times S$$

$$I = \frac{P}{LOS} \quad \ldots\ldots\ldots(6)$$

$$L = \frac{P}{IOS} \quad \ldots\ldots\ldots(7)$$

$$O = \frac{P}{ILS} \quad \ldots\ldots\ldots(8)$$

$$S = \frac{P}{ILO} \quad \ldots\ldots\ldots(9)$$

Equations 6,7,8 and 9 imply that only price (P) relates directly with I,L,O and S. The other components relates inversely one with another. This means, for example, that if the farmer allocates an unduly high portion of income to saving, the portions of the other variables will reduce proportionately. The cost of inputs (I) is important for the conduct of the production process. Difficult situations such as unfavourable physical conditions and outbreak of diseases may also raise the cost of inputs as to disrupt the price

relationship and make production uneconomical. The cost of living (L) represents the cost of essential expenditures borne by the farmer. The prices of other cash crops have a role in this relationship because the farmer tends to cultivate the crop (s) whose price yields the highest relative profitability. Saving is the reserve which the local farmer uses to purchase agricultural innovation. It may also be ploughed back into the farm to expand operations and increase agricultural production after the satisfaction of I,L, and O. Such expansion will represent the farmer's response which may lead to rural transformation.

Therefore, for the price of commodity X to induce more production of X, it has to accommodate I, L, O and S. This defines the relationship under which the price of agricultural products will induce more production of such products. If this relationship is strained production may fall or cease. This appears to be the explanation for the decline in the cultivation of cotton and groundnut in the Zaria area.

However, while Tables 5.1 and 5.2 show that the prices of cotton and groundnut rose during the period, Table 5.3 carries a different information about the prices of these commodities. It is observed though, that the

data here cover a different period and the prices are Free On Board (F.O.B.). Furthermore, the market prices of yams and groundnuts in Zaria, according to Tables 5.4 and 5.5 appear to have resulted from the demand and supply situations of those crops in the open market. And a trend which departs from those shown in tables 5.1 and 5.2 is therefore the case.

Table 5.3: Free on Board Prices of Cotton and Groundnut

Years	Average FOB Prices in £ Per Tonne	
	Cotton Lint	Groundnuts
1957/58	221.66	52.86
1958/59	198.80	55.24
1959/60	208.13	61.74
1960/61	220.36	59.43
1961/62	221.20	56.04
1962/63	213.92	54.55
1963/64	219.43	58.75
1964/65	219.62	66.09
1965/66	199.70	63.32

Source: Nigerian Produce Marketing Company Limited Fourth Annual Report. Lagos November, 1967

Table 5.4: Commodity and Service Retail Prices in Kobo per Pound Weight of Yams and Groundnuts in Zaria - Annual Average

Year	Yams	Groundnuts
1961	1.9	4.0
1962	2.3	4.2
1963	2.0	3.4
1964	1.6	3.6
1965	1.7	3.7
1966	1.9	3.9
1967	1.5	3.5
1968	1.3	3.4
1969	1.5	5.6
1970	1.9	3.7

Source: North Central State of Nigeria Statistical Yearbook, 1972. Page 145.

The highest and lowest average price per pound weight of yam during the period shown are 2.3 kobo in 1962 and 1.3 kobo in 1968. This gives a difference of only 1 kobo between 2.3 kobo and 1.3 kobo which suggests a fairly stable trend during the period shown in Table 5.4. The average prices of groundnut

on the other hand are relatively higher in Table 5.4 with a range of 2.2 kobo. In Table 5.5 the prices of both commodities fluctuate, but not very widely, with yam recording a higher average price of ₦286 per ton while the average price of groundnut stands at ₦255.5 per ton. Further attempts made during this research project to assess the price of yam in time and space are contained in the section which follows.

Table 5.5: Commodity Prices in Naira per Tonne in Zaria

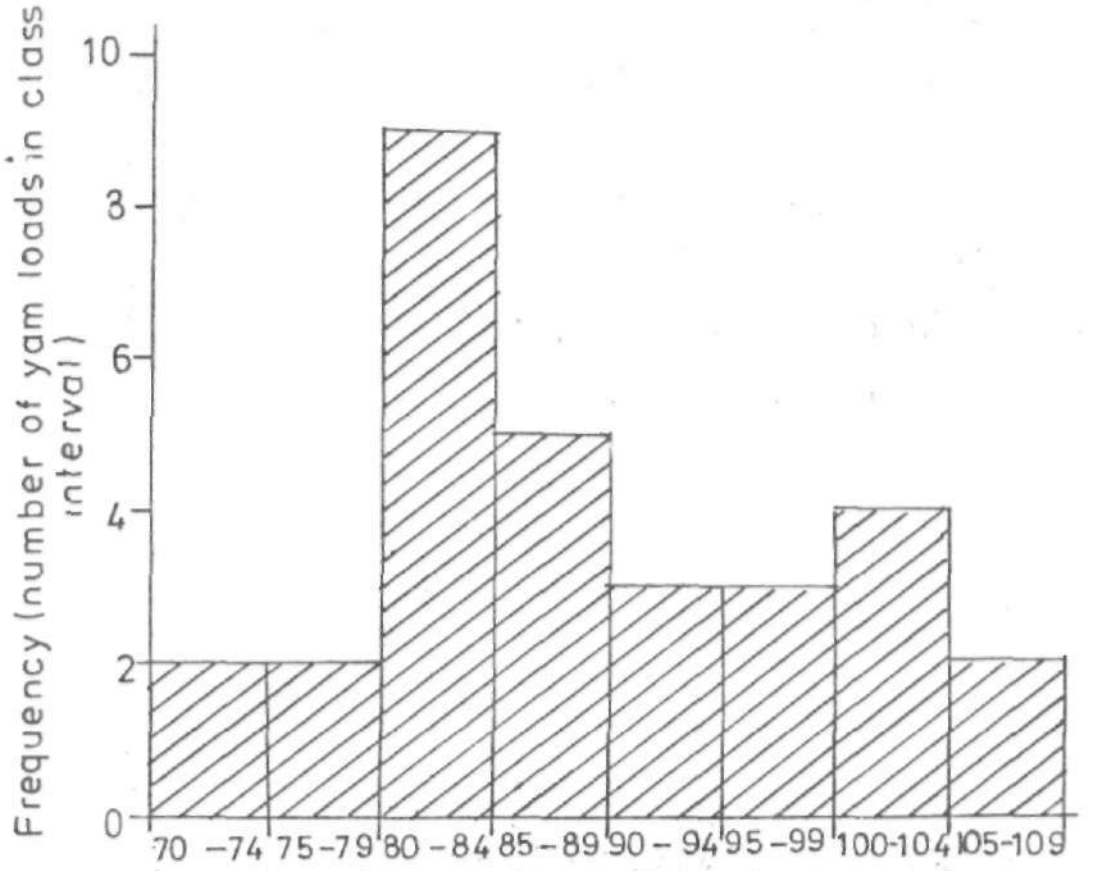
Period	Yams	Groundnuts (unshelled)
October, 1982	300	200.0
November, 1982	178	200.0
December, 1982	178	300.0
January, 1983	360	333.0
February, 1983	200	200.0
March, 1983	500	300.0
Average Price	286	255.5

Source: Extracted from files provided by Mallam Yahaya Funtua, Development Officer, Kaduna State Integrated Rural Development Project, Maigana, 1984

5.4 Spatio-Temporal Patterns of Yam Prices

Empirical evidence showed that three distinct approaches of measuring yam tubers for sale operate within the exchange economy. In the first, tubers are commonly displayed in clusters at the roadside and local markets, the number of tubers varying in accordance with prices. Several clusters with equal number of tubers are displayed in a row. The number of tubers in a set of clusters may be four, five or more as the case may be. Secondly, tubers may be handled in a unit of one hundred and this is commonly the case with bulk purchases. The third uses the donkey load as a unit of measurement and it is the system which was adopted in the present study. This was because the basket on the donkey's back is a defined and uniform size within which an average weight could be ascertained and treated as a working unit. The other two approaches depend on number and since tubers vary very widely in sizes, such approaches suffer from a serious lack of uniformity. Fig. 16 shows the outcome of the measurement of 30 donkey loads conducted to establish the average weight of a donkey load of yam. From this exercise, 88.40 kg emerged as the average weight of a donkey load of yams.

FIG.16:WEIGHTS OF DONKEY LOADS OF YAMS IN THE ZARIA AREA



Class intervals of weights of donkey loads of yams in Kilograms.

Co-efficient of variation (cv) = 11·44%)

Note:-The low CV value implies that many of the weights approximate very closesly to the average weight. For this reason the average weight of 88·40 Kg. can be accepted as a standard weight of a donkey load of yam in the area.

Having established a standard workable unit that can be applied uniformly throughout the study area, another attempt was made to investigate the price changes per donkey load through time and space. Four base periods were used for the conduct of the investigation. These were March, June, July and November corresponding with the mid-planting season, mid-growing season, mid-early harvest, and mid-main harvest season respectively (Fig. 6). The locational bases under each period were: the farms; the local markets; and Zaria urban market (Sabon-Gari). Detailed information is set out in Table 5.6.

It is to be emphasised that there were instances in June, when urban prices were as high as ₦45 per donkey load of yams and that during periods of yam scarcity (May - June) it was common for sellers to present what they consider as equivalence of a donkey load of about 48 tubers rather than actual loads for as high as between ₦46 and ₦55. Moreover, such equivalences were often less than average weight of a load. By May, 1984 an equivalence of a load had gone up to between ₦60 and ₦70 in Fara Kwai, according to interviews by the researcher. The figures in Table 5.6 therefore represent strictly average prices for the year shown.

Table 5.6: Average Price (in ₦) Per Donkey Load of Yams in Zaria Area 1982 - 83.

Locations	Mid-Planting season - March	Mid-growing season - June	Mid-early harvest - July	Mid-main harvest - Nov.
Farm	17	-	12	16
Local mkt.	27	25	14	21
Urban mkt.	33	37	18	28

All season average price = ₦22.60

Source: Field Survery. 1982.

An investigation into the cost of transporting yams in the area showed that the three commercially important means of conducting this business are the donkey, the van/lorry and the trailer. The donkey is useful in evacuating yams from remote farms to local markets and to convenient locations for onward distributions by motorised transports. Four-wheel delivery vans also convey tubers to local markets, but bigger vans and lorries are employed for transport services between local markets and nearby urban centres. The trailer is engaged for conveying yams to distant urban markets such as Lagos, Maiduguri, Sokoto, Katsina and Kano, in many cases.

Based on field survey (appendix III), the average cost, in kobo per donkey load per kilometer, of transporting yams by these three transport modes were:

Donkey	-	36.27
Van/lorry	-	6.3
Trailer	-	0.24

The highest cost of 36.27 kobo is associated with the donkey which operates more often in remote areas where access routes are poor or completely absent.

At this stage, what remains of this price analyses is a consideration of the types of marketing organisation of major cash crops with the aim of assessing the relative efficiency of the existing marketing organisations.

5.5 Types of Marketing Organisation of the Major Cash Crops

With reference to the influence of relative price changes on the level and pattern of agricultural production, Raba (1981a) has observed that the general tendencies have been the expansion of production under conditions of high and stable prices and efficient marketing system, and reduction of production under low and unstable prices and inefficient marketing system. It will then appear that profitable producers' prices and efficient marketing system correlate very closely and directly in a relationship in which the former depends largely on the latter. The relative efficiency of the marketing system, therefore, becomes another means by which the relative profitability of agricultural prices can be judged. The relative efficiency in question is discussed under two types of marketing organisations the traditional marketing organisation and the Marketing Board organisation. For the sake of convenience the discussion begins with the Marketing Boards.

5.5.1 Marketing Board Organisation

The position which governs the sales of cotton and groundnut will form the basis for the assessment of the Marketing Board organisation. Much of the information on this subject was collected during interviews between the researcher and the Produce Officer, Zaria, the Assistant General Manager (operations), Nigerian Cotton Board, Funtua and with farmers.

The sale of cotton is done during the cotton buying season which falls between November/December and April. Besides, sales are conducted at approved cotton markets which are also Produce Inspection Centres. Although the sale of groundnut is not confined to the official buying season, Groundnut Special Inspection Stations remain the major marketing centres for the crop and the buying season, according to the Groundnut Board, stretches from November/ December to May.

Under the marketing arrangements of cotton and groundnut, therefore, sales at the buying centres may be done only during the buying season. This limitation militates against the initiative of a farmer who might

store his crop for deferred sales when higher prices could be earned. Furthermore, crops may only be sold during the hours of the day when agents are present at the stations. These weaknesses cause delays in the immediate disposal of agricultural products; this is besides the fact that prices are fixed without the knowledge and the participation of the local farmer. For this reason, it is not uncommon for prices in the open market to be higher than those paid at the buying stations during the life of the Marketing Board or its successor, the Commodity Boards which were established in April, 1977 (The Bullion, 1977).

Referring to the relatively low prices paid by the Marketing Boards, the Standard Chartered Review (1975) remarked that "Groundnuts sold through unofficial channels continue to attract good prices and many farmers appear to be still bypassing the buying agents". Baba (1981a) listed other limitations of the Marketing Boards as including "dependence on middlemen in the marketing chain, and managerial inefficiences". Helleiner (1970) and Nixon (1970) outlined how reserves of the Marketing Boards which were meant for the stabilisation of producers' prices were largely used for government development plans. The cost of such developments was thus imposed upon the rural producer

who was paid prices which were anything but stimulating to more agricultural production.

Thus the prevailing marketing arrangements of cotton and groundnut by the Boards in which the participation of the producer in pricing is denied and which limit sales of produce to time and space or both cannot be said to be efficient and certainly not in the best interest of the producer. Kankia (1984) agreed that the poor marketing arrangements of cotton and groundnut by the Boards have militated against increased production of these crops. He advanced another reason for the decline in cotton production but particularly for the displacement of cotton by maize in the Funtua Agricultural Project. He noted that whereas the technology for accelerating cotton production was yet to be developed, the herbicide and the machinery for use in increasing maize production are available and widely used in the project area. The available mechanical devises range from simple hand shellers for small scale farmers, through medium size machine shellers for medium scale farmers to the combined harvester for large scale farmers. These technologies, together with the personal involvement of the farmers in the price process seemed to have resulted in the displacement of cotton by maize in the area.

Seen against the poor marketing organisation, the price levels of cotton and groundnut by their respective Boards do not seem to benefit the producer in the sense which satisfies the price relationship (model) described above. The tendency towards declined production under low and unstable price and inefficient marketing system appears to apply to cotton and groundnut under the Marketing Board organisation.

5.5.2 The Traditional Marketing Organisation

Besides documented sources, the present research shows that the yam market of the Zaria Area is footloose as sales can be done at the roadside, the local market and the urban markets (Baba, 1976; Mortimore, 1978); or even at the farm where bargaining may cover harvested tubers and unharvested lots. As tubers can be sold to inter-urban travellers and middlemen, the nearest and most convenient points on the roadside are sufficient for the yam farmer, who is also free to display his wares as and when they are available.

Moreover, the local producer enjoys the choice of selling his tubers at any time of the day and at any of the avenues that are open to him including the urban market where competition from buyers can earn him a

good price that repays the efforts of intensification of agricultural production. In the procees, the local producer is directly involved in the bargaining of his ware in a manner which is aptly outlined by Scott (n.d.) who notes that:

> With expanding commercialisation of food crops in Northern Nigeria, the internal organisational structure of rural produce markets changed. Those changes involved the increasing participation of farmers in aspects of the markets formerly held by traders, dillalai (middlemen) and other full-time market participants..... They also adjusted commodity supply to influence market prices and they assume the role of sellers in certain expanded sections of old and new markets (Ibid., p.108).

Stressing the importance of price perception in inducing agricultural production, the author further observes that:

> Perception of price is strongly associated with willingness to produce. When farm prices are determined by conditions and forces other than the farmer, they tend to be low, and .... low produce prices mean low income, which severely limits farmers' ability to purchase innovations that help improve agricultural production. Whereas artificial strains on farm prices, the number of intermediaries in the market system, inadequate storage facilities, taste, expectation and satisfaction of the buyer or the seller are important in formulation of commodity prices, it is the direct, personal participation of the farmer in the setting of the price that seems to influence his future decisions regarding production and exchange (Ibid., p.108).

Therefore, the range of advantages which are open to the rural producer in the traditional market as a result of his direct personal participation in the open market are the very factors which make the traditional marketing organisation of this type efficient.

Moreover, whereas the sale of cotton and groundnut, according to the procedure of the Commodity Boards seriously limits the effectiveness of group bargaining by producers, this is not so for the sale of yam according to traditional marketing organisation. In the traditional system, farmers sell in incipient groups to offset middlemen potential for depressing farm prices. Farmers display their wares together. Collectively, they would have agreed on a range of prices to be effective on a market day. If at the end of the day, low variability in prices prevailed, this indicates that price was just and fair. The cartel ensures that members of the group sell their produce and at a relatively profitable price.

Thus the sale of yam in the traditional market where there is close and positive relationship between price perception and the willingness to produce seemed to have shown up in raising the level of yam production

and in changing the pattern of agriculture in favour of yam production in the study area. Convenient market location, direct personal participation of the producer, the organisation of the cartel to protect producers against middlemen and ensure profitable prices within just limits are essential aspects of the traditional market system which make it efficient compared with the Commodity Board system.

From the view point of comparative efficiency, the price levels which emerge from the traditional marketing system may be considered beneficial to the farmer and satisfactory in terms of the price relationship (model) postulated above. Therefore, the tendency of increased agricultural production under rising prices and efficient marketing organisation seems to be the corollary which holds in the case of yam as a major cash crop. This has been an increasing tendency and it represents the farmer's spontaneous response which underlies the transformation in rural Zaria.

CHAPTER SIX
LABOUR ORGANISATION

6.1 Introduction

This chapter identifies three stages of evolutionary changes in the cultivation of yam in the study area. The organisation of labour is examined during two of the phases - the pre-commercial and the commercial stages. The discussion on the pre-commercial labour organisation helps to show the position of labour organisation as it affects other crops in the study area. Although the commercial labour organisation is woven round yam as a major commercial crop, other crops in the area are not left out of the seasonal labour activities.

The organisation of family labour and that of migrant labour are examined. Since the general labour organisation is examined within the context of the evolution of yam cultivation in the study area, the stages of the evolution and their probable duration is first discussed. But while the evolution was only mentioned earlier in this thesis, attempt is made here to support the suggested evolution with documentary and field evidences.

6.2 Stages of Yam Evolution in the Zaria Area

From documented evidence and from the analyses of the landuse practice in the area conducted in Chapter four (Figs. 11, 12, 13 and 14), the evolution of yam cultivation in Zaria may be broken into three stages namely, the preliminary stage, the pre-commercial stage

and the commercial stage. The preliminary stage probably began about the middle of the 1940s and stretched through the 1950s. During the period, yam cultivation seemed to have been on a very small scale though it might have taken root in the area. In 1944, a letter from the Agricultural Department, Ibadan held that "white yams which have done well at Moor Plantation include... Mampha from Maigana, Fara Kwai" (Zaria Provincial Report, 1945).

In 1956, the same document made a report on the commercial and staple food crops in the area without any reference to yam. This suggests that the level of yam cultivation at the time might have been too limited to be noticed by the colonial administration. Yet the crop was placed under the control price of one penny per pound weight during the year 1946 (Ibid.). The demand for yam had risen in urban Zaria (Sabon Gari) following the assemblage of strangers from southern Nigeria and this had probably necessitated the control of yam prices.

The pre-commercial stage is likely to have been a transitional period when the process of yam cultivation in the prevailing ecological conditions was adopted by more and more farmers in the area. The rise in the level of production appeared to have been very gradual

(Fig. 11) during the period which probably spanned the late 1950s and the whole of the 1960s.

The commercial stage seemed to have set in in 1970 with the tempo of production increasing in 1975 (Fig. 11).

6.3 The Pre-Commercial Labour System in the Area

In Chapter three of this thesis, it was noted that prior to the commercialisation of yam, which corresponds with the preliminary and pre-commercial stages, the lifestyle of Zaria rural societies evolved round a subsistence economy. This was in turn based on the exchange of essential commodities. During the period, labour was not commercialised and there were no hired workmen in the area. This was because the limited labour that was required for the largely subsistence agriculture was provided by the family with supports from relatives when there was need. Crops like guinea corn, millet and vegetables were grown for food as it is the case now; but the crops also went into the exchange economy especially the cereals. And although other cash crops (cotton and groundnut) might have been grown at the time, the relatively limited internal labour seemed adequate for the non-commercialised agriculture of the period.

Moreover, the rural societies appeared to have been closely knit and somewhat closed to strangers. With the gradual penetration of urban influence and the commercialisation of agriculture, the rural societies have tended to become more open and more receptive to strangers.

Thus the organisation of labour during the pre-commercial period was largely a family affair . Male members of the family and the children who were of age constituted the workforce and work was based on two short daily sessions during the farming season. The sessions were shorter compared with the present system probably because the largely subsistence and exchange agriculture required less labour input. Communal labour was reported to be contracted not strictly on monetary terms. Food and drink or a token fee was given in recognition of work done or service rendered.

6.4 General Labour Organisation During the Commercial Stage of Yam Cultivation

With the onset of commercial production of yams in the study area, the demand for labour rose beyond the capability of the local labour with the result that migrant labour was needed. Thus three clearly

marked types of labour organisation seem to have emerged under the impact of yam cultivation. These are individual paid labour who are invariably migrants, contract or communal labour and family labour.

According to the field survey of the present study paid labour is engaged on a daily basis. Man hour input per day averaged six hours (7 a.m.-1 p.m.) and it attracted an average daily wage of ₦3.50 in 1980. In the case of contract labour, an agreed sum is reached between the farmer or his agent and the workmen or their representatives. The extent of the job is assessed by both parties and a negotiated sum is paid for the job. Under the cash influence of the yam enterprise, however, deals involving communal labour appear to be more or less identical with those of contract labour especially where the needed labour is for yam plots. For this reason communal and contract labour are used inter-changeably in this write up.

Table 6. 1 shows that this class of labour was not used in Dunki and that all the 980 paid labour fell under the daily paid labour. Also set out in the table is the distribution between daily paid labour and contract labour in Igabi and Fara Kwai. In terms

of number, the daily, paid labour was more by far and constituted 71.6% of total paid labour in the study area.

6.5 Organisation of Family Labour

Family labour consisted of the farmer, his children and his relatives. Due to the traditional practice of wife seclusion in the area, the contribution of married women to farm labour is negligible. Seclusion of married women in Hausa Moslem societies has been documented by other writers (Smith, 1955; Hill, 1972; Baba, 1975). For this reason, married women are not included in the organisation of family labour in this project. Only children who according to the responses of the farmers, participated either on full-time or part-time basis to farm work, were included in the exercise. This excludes children who were too young to assist on the farm.

Table 6.1: Daily Paid Labour and Contract Labour as Percentage of Total Paid Labour

	Total No. of paid labour employed	Daily Paid Labour		Contract Labour	
		Total	%	Total	%
Igabi	3583	2206	61.6	1377	38.4
Fara Kwai	2151	1622	75.4	529	24.6
Dunki	980	980	100.0	-	-
Total	6714	4808	71.6	1906	28.39

Source: Field Work 1980

Since the unavailability of cash was reportedly a common problem to most farmers in the area, family labour was significant and distinct from paid labour in the sense that it is free and the most reliable. For this reason, this category of labour will form the basis of the estimates which follows.

6.5.1 Diurnal Schedule of Family Labour

Interviews during the project revealed that the diurnal schedule of work on the farm in respect of family labour is as illustrated below in Fig.17.

Fig. 17 Family Labour: Diurnal Schedule During Farming Season



Source: Field Interview, 1982

7 Hours represents the average labour input per man per day or one-man day is 7 hours.

The schedule operates during the growing season which lasts six months, May to October. Since the farmer is engaged in the production of yam for the market as well as in the production of food crop for his family, the growing season is a very busy one for him. It is also the period when the demand for farm labour is comparatively high. However, activities which are connected with the production of yam spread throughout the year (Fig.18).

6.5.2 Annual Manhour Input of Family Labour

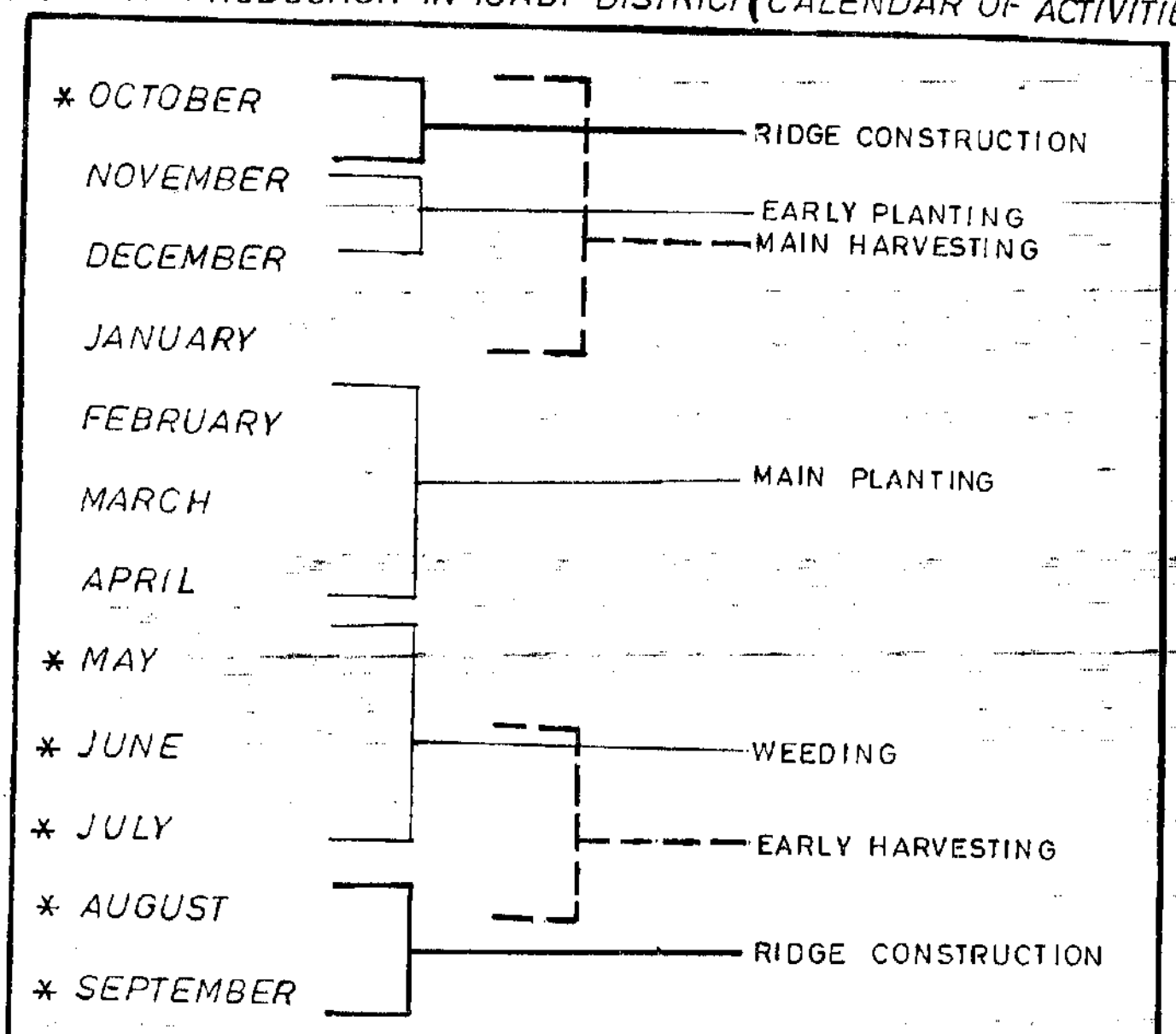
On the basis of the periodic breakdown of farming activities in Fig.18, the following annual manhours was estimated in the study area with respect to yam cultivation.

(a) Six months growing period, May to October of 184 days, but allowing two days each month for exigencies such as illness, urgent travels and rest yielded an estimate of 172 days.

(b) September and October, ridge construction period at an estimated period of 25 days, allowing rests in between the period as the operation is labour exacting.

(c) Other activities fall outside the busy growing season and ridging time in (a) and (b) above.

G.18 :YAM PRODUCTION IN IGABI DISTRICT (CALENDAR OF ACTIVITIES)



Note:-

* RAINY MONTHS WHICH COINCIDES WITH GROWING PERIOD AND TIME OF PEAK LABOUR DEMAND.

SOURCE:- FIELD SURVEY 1980

Since they are less labour exacting, the amount of labour input was estimated at six full days work per month (i.e. one fifth of one month). This yields the following estimates:

i) Main harvest and early planting from October to January. Since October is included in (a) the estimate covers November to January i.e. 18 days approximately.

ii) Main planting from February to April i.e. 18 days approximately.

The sum of (a) (b) and (c) gives 233 days. But one man day is equivalent to 7 hours, according to the diurnal schedule above. Therefore, total man hours is 1631 man hours per annum.

Cognizance is taken of the average number of hours which adult farmers spend working on the farm per day as documented variously by other writers. Within Nigeria, the following variations have been observed.

4 hours in parts of Rivers State (Martin, 1956).
8.4 hours in Mokwa District (Baldwin, 1957).
8 hours in Katsina Province (H.A. Luning, 1963).
8 hours in Sokoto Province (H.A. Luning, 1964).
5 hours in Makarfi District of Zaria Emirate (F.A.O., 1965).
8 hours in Kura District of Kano State (Baba, 1975).

Numerical variation which are evident in the figures are to be expected as the investigation which yielded them were conducted using different methods and under different physical and socio-economic circumstances.

In his study of Kura District, Baba (Ibid) estimates that the farmer puts an average of 1600 man hours per annum. The estimate of 233 working days a year which relate to yam cultivation may not be regarded as an over-estimation. This is more so when it is remembered that the activities spread over the year. Moreover, the estimate falls within acceptable limits, as it is only three days more than Norman's (1968a) average of 230 days a year for the Nigerian farmer.

6.6 The Organisation of Migrant Labour

The organisation of paid labour, on the other hand, is based on migrant labour from other areas. Stouffer (1940) postulated that "the number of persons going in a given distance is directly proportional to the number of opportunities at that distance and inversely proportional to the number of intervening opportunities". This is to say that the existence of job opportunities exerts a pull to which migrants respond positively. Migration

studies by Udo (1970,1975) have shown that Stouffer's concept also applies in Nigeria. And the present study reveals that there have been adjustments to the new labour demand situation in the Zaria area. The analysis which follows highlights the adjustment in terms of spatial mobility of migrant farm workers.

From the administration of questionnaires(appendix II) 292,120 and 31 respondents farm workers were interviewed in Igabi, Fara Kwai and Dunki respectively. Table 6.2 describes the sex and the distribution of the home states of migrant workers in Igabi village.

Whereas the farm operations for which males were hired were ridge construction (huda gona), weeding (noma) and harvesting/packing (girbi), that for females was confined to weeding alone. A further breakdown of the respondents from Kaduna State according to Local Government Areas shows that most of the local government areas are well represented. Table 6.3 contains the breakdown. The widespread absence of female workers reflects the importance of social customs and tradition in Hausa moslem societies referred to above. Only Saminaka Local Government Area has female representations.

Table 6.2: Migrant Farm Workers at Igabi
Sex and Distribution of Home States

	Kaduna		Sokoto		Kano		Bauchi		Gongola		Benue		Plateau		Kwara		Borno		Niger		Others*	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
No.	112	5	61	-	54	-	13	-	4	-	5	-	15	6	2	-	7	-	3	-	5	-
% of Total	40%		20.9%		19%		4.5%		1.4%		1.7%		7.2%		0.6%		2%		1%		1.7%	

* Neighbouring West Africa

M = Males

F = Females

Source: Field Survey, 1980

Table 6.4: Migrant Farm Workers in Fara Kwai. Sex and Distribution of Source Area on the Basis of States of Origin

	Kaduna		Kano		Sokoto		Plateau		Gongola		Bendel		Borno		Niger		Kwara		Others*	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
	42	2	41	-	20	-	1	-	4	-	2	-	5	-	1	-	1	-	1	-
	44		41		20		1		4		2		5		1		1		1	
% of Total	36.5%		34%		17%		.83%		3.2%		1.66%		4%		.83%		.83%		.83%	

* Neighbouring West Africa

M = Males

F = Females

Source: Same as in Table 6.2

By contrast, Fara Kwai, as an absorbing centre, enjoyed the representation of a southern source area, Bendel State as shown in Table 6.4. In terms of the number of respondents available at the time of the survey and in terms of the number of states represented in Dunki village, the situation is very much reduced in scale (Table 6.5). In Table 6.5 total population of paid farm workers is shown to be only 31. These were all males and not more than five states were represented in this village.

From Tables 6.2, 6.4 and 6.5, the dominance of Kaduna State in all three centres has clearly shown the effect of proximity. Thus high number of migrants correlated positively with short distance and in consonance with Ravenstein's (1889) general law of migration

Table 6.5: Migrant Farm Workers at Dunki: Distribution of Source Areas on the basis of States of Origin

	Kaduna	Kano	Sokoto	Bauchi	Plateau	Total
	21	1	4	1	4	31
% of Total	67.8	3.2	12.9	3.2	12.9	100.00

Source: Same as in Table 6.2

that most migrations occur over short distances. The

remoteness of Dunki as an absorbing centre appears to have exercised a limiting influence on the number of migrants found here. The zone which isolates Dunki is represented by the area covered by footpaths and which stretches from points on the Zaria - Kaduna road to the settlement itself. The area forms a remote zone because it hardly permits the use of motorised transport (bus, lorry) which is the major means of movement by migrants. This remote zone constitutes a resistance in the migratory flow and may be seen as 'intervening obstacle' according to Lee (1966) or intervening resistances.

6.7: Rhythm of Migrant Labour Movement

Whereas the source areas of the migrant labour were easily identified, their rhythm of movements as regards their arrivals and departures is less marked. The two migratory flows generally do not seem to relate to the farming calender but appear as a matter of individual convenience and needs. Only in Igabi and in respect of migrants of Kaduna State origin did the survey reveal a clear trend in the outward and return flow of migrants. Table 6.6 shows the number of arrivals and departures of these migrants on a monthly basis. Fig. 26 shows the percentage arrivals and departures of the migrants.

Only the cases of 32 out of 104 arrivals (or about 31%) observed for April and May seemed to be connected with weeding which begins in May. The arrival of 45 migrants(or 43%) in January appears to be connected with the main planting season which lasts from February through April.

Thirty-three out of 87 departures (or 38%) recorded for June suggest that the migrants concerned would have left for home after accomplishing available jobs in weeding or at one stage during weeding which begins in May and ends in July. The inward and outward flow of migrants in Igabi seemed then to relate substantially with the calendar of activities in respect of yam production. However, when it is considered that Igabi alone accounts for 292 (or 66%) of the total of 443 migrant labour covered during the survey, such a relationship may be considered strong and may be used to describe the migrant labour pattern which has emerged in the area under the impact of yam cultivation.

Table 6.6: Monthly Arrivals and Departures of Migrants of Kaduna State Origin at Igabi Village

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
No. of Arrivals	45	7	6	12	20	4	4	2	2	-	-	2	104
% of Totals	43	7	6	11	19	4	4	2	2	-	-	2	100%
No. of Departures	-	2	4	2	2	33	3	8	17	4	2	10	87
% of Totals	-	2	5	2	2	38	3	9	20	5	2	12	100%

Source: Field Survey, 1980

Table 6.7: Personal Expenditures in the Installations of Zinc Roofs in Igabi, Fara Kwai and Dunki

Year	Number of Houses	Estimated Total Cost (in Naira)
1960	2	200
1961	-	-
1962	2	100
1963-64	-	-
1965	3	200
1966-68	-	-
1969	6	449
1970	56	7488
1971	8	868
1972	9	1487
1973	1	90
1974	23	3010
1975	17	2109
1976	34	4402
1977	32	3195
1978	53	7438
1979	31	2759
1980	55	5257

Source: Field Survey, 1980

The impact can also be seen in the present organisation of family labour in which longer hours of labour have replaced the shorter hours which prevailed during the pre-commercial stages.

It would also appear that the evolution of yam cultivation has brought about some institutional changes among the rural communities. From the rather close structure during the pre-commercial periods of yam cultivation, the communities have become more open and more receptive to strangers most of whom constitute the paid migrant workers in the area.

There has also been a rise in the number of rural infrastructural installations. In Table 6.7 and 6.8 the installations in respect of zinc roofs and cement floors are shown and their number appears to have increased over the years. More rented apartments seemed to have become available for strangers. There are more permanent arrangements under which land is leased to strangers for putting up their houses as is the case in Igabi village where migrants from Southern Zaria have built their own compound. This is located at about two kilometers from the village and on the main approach to it. It may well form the nucleus of the 'Sabon Gari' of Igabi village.

While the improved conditions of access routes, where they exist, may not have resulted from the influence of yam cultivation, the yam enterprise has taken advantage of the high quality access route in respect of the Zaria - Kaduna highway which passes through Fara Kwai. The route which leads to Igabi via Amana has only been improved by the Galma River Basin Authority whose farm project lies close to Igabi village.

Table 6.8: Personal Expenditures in the Installation of Cement Floors in Igabi, Fara Kwai and Dunki

Years	Number of Rooms	Estimated Total Cost (in Naira)
1960-69	-	-
1970	24	430
1971	-	-
1972	28	791
1973	2	80
1974	24	870
1975	20	1480
1976	28	920
1977	38	1622
1978	54	3606
1979	33	2215
1980	58	4575

Source: Same as in Table 6.7

Thus two major changes may be identified between the past and present system of labour organisation in the study area. The one is the longer hours in the input of family labour on farms in the present system; the other is the emergence of migrant labour hitherto absent in the old system. They are changes which appear to have come in the wake of increased labour demand and rising expectations in the rural economy.

CHAPTER SEVEN

ASSESSMENT OF OBJECTIVES AND HYPOTHESES OF THE STUDY

7.1 Introduction

The subject of this chapter might have been treated in the previous chapters on data analyses. But this was considered inappropriate because those chapters dealt with other specific topics. Consequently, the assessments in question are given separate attention in this chapter.

On the basis of the analyses conducted in the study, the chapter sets out to demonstrate the achievement of each statement of objective. This attempt also serves as the summary of the findings of the study. On the same basis, the chapter also examines the extent to which each hypothesis is either withheld or modified.

7.2 Assessment of Objectives

Figs 9 and 10 show that there was a remarkable expansion in the area of land brought under agriculture between 1964/65 and 1972. However, the period falls short of the two decades required by the first statement of objective. Moreover, the evidence embraces all aspects of agriculture whereas the statement is particular about the evolution of yam. The appropriate air photographs were not available

for analysis. To offset these setbacks, use was made of the information in Figs. 11, 12, 13,and 14. which covers two decades, 1960-1980. These Figs. also show changes over time in the area under cultivation of yam and related cash crops. Based on the illustrations and on historical evidence the evolution of yam production in the area was reconstructed and it appeared to have covered three stages, the preliminary, the pre-commercial and commercial stages.

During the preliminary stage which covered the period between 1940s and the 1950s, yam cultivation seemed to have been in its infancy and on a relatively small scale. The pre-commercial stage represents the transitional period between the preliminary and the commercial stages and probably spanned the late 1950s and all of the 1960s. During the period, the process of yam cultivation under the prevailing ecological conditions was gradually adopted by more farmers in the area. The rise in the level of production also appeared to have been slow but, steady(Fig.11). The final stage,the commercial stage seemed to have begun around 1970, with an increase in the tempo of production setting in in 1975.

The second statement of objective proposes the examination of the impact of the evolution on other traditional cash crops in the area. The approach adopted in the project to determine the required impact was that of studying the relationship between the areas of land brought under the cultivation of yam, cotton and groundnuts. It was considered that as the three crops compete for arable space within the economy, the process of crop substitution might prevail as the crop(s) which yields the highest relative revenue tends to displace the others over time. Thus according to the evidence in Fig. 11 which shows the average information in Figs. 12, 13 and 14, the area under yam cultivation rose throughout the period while that under cotton rose only up to 1970 but declined between 1970 and 1980. The groundnut curve, on the other hand, rose until 1975 when it fell throughout the remaining period.

However, for a more accurate assessment of the relationship between the areas under the crops, the partial correlation coefficient analysis was employed. The formula for the partial coefficient $r_{xy.z}$ between variables x and y with the effect of z, the third variable removed, is stated by Monkhouse and Wilkinson (1971) thus:

$$r_{xy \,.\, z} = \frac{r_{xy} - (r_{xz} \,.\, r_{yz})}{\sqrt{\left[(1 - r_{xz}^2)(1 - r_{yz}^2)\right]}}$$

The same formula was used to calculate the values of $r_{xz.y}$ and $r_{yz.x}$ where

x represents the number of plots under yam cultivation

y represents the number of plots under cotton cultivation

z represents the number of plots under groundnut cultivation

r represents the correlation coefficient sign

The numbers of farm plots (Table 7.2); provides the data for the partial correlation analysis. The result of the analysis for the three centres is stated below.

Table 7.1: Partial Correlation Coefficients showing the Relationship Between Lands Under the Cultivation of Yam, Cotton and Groundnut in Igabi, Fara Kwai and Dunki.

Centres	$r_{xy.z}$	$r_{xz.y}$	$r_{yz.x}$
Igabi	-0.80	0.97	-0.71
Fara Kwai	-0.28	-0.61	0.04
Dunki	-0.65	0.85	0.41

Source: Field Suvey, 1980

Table 7.2: Number of Farm Plots Under the Cultivation of Yam, Cotton and Groundnut in Igabi, Fara Kwai and Dunki

	Igabi			Fara Kwai			Dunki		
Years	Yam	Cotton	G/nut	Yam	Cotton	G/nut	Yam	Cotton	G/nut
1960	203	156	211	152	134	400	62	46	52
1965	286	196	280	205	164	478	116	85	107
1970	423	222	392	284	162	587	161	114	157
1975	605	206	484	406	100	569	204	96	265
1978	759	138	502	540	72	394	248	30	219
1979	924	86	501	682	49	341	293	9	255
1980	1049	74	525	826	49	353	330	7	295

Source: Field Survey, 1980

The above results appear to support the information in Figs. 13, 14 and 15. $r_{xy.z}$ shows an inverse relationship betwwen x and y (yam plots and cotton plots) in all three centres. But while the inverse relationship is strong in Igabi (-0.8) and substantial in Dunki (-0.65), it is weak in Fara Kwai (-0.28). This implies that while the number of yam plots rises, that for cotton plots falls during the period. $r_{xz.y}$ shows a strong positive correlation between x and z (yam plots and groundnut plots) in Igabi (0.97) and in Dunki (0.85), but an inverse relationship in Fara Kwai (-0.61). The movement between yam plots and groundnut plots (x and z) seems to be close during a greater part of the period under consideration - 1960 to 1975 (Fig. 12). This seems to be responsible for the correlation value of (0.97). $r_{yz.x}$ is of little importance to this study. This is because the focus here is not on the relationship between cotton plots and groundnut

Plots but between yam plots and plots of each of the other crops. Nevertheless, only in Igabi is there an inverse relationship between cotton plots and groundnut plots.

The implications of the correlation analyses and those in Figs. 12, 13 and 14 in terms of the relationship between yam and other crops are two. The one is that the number of yam plots and cotton plots correlate inversely over the entire period in all three centres. The next is that a similar inverse relationship between yam plots and groundnut plots surfaced only during a quarter of the period, from 1975 to 1980. In both cases, the area of land under yam cultivation increases as those under cotton and groundnut cultivation decrease. Therefore in the competitive landuse system in which yam prevails over the other crops, the impact of the evolution of yam is expressed in the displacement of cotton and groundnut. The impact on cotton appears to have spread over the pre-commercial and commercial stages of yam evolution while that on groundnut became pronounced only during the commercial stage.

The third statement of objective seeks to examine the impact of yam production on the rural labour organisation. Such impact seemed to be made manifest

in two major areas. The first is the more intensive application of family labour through the input of longer hours on the farms. An analysis of the diurnal schedule of family labour during the farming season (Fig.17) shows that the average labour input per man per day is seven hours after the onset of the commercialisation of yam in the study area. This may be set against the pre-commercial period when the largely subsistent agriculture required less labour. An average labour input per man per day of five hours has been observed in Makarfi District of Zaria Emirate (F.A.O., 1965). The second area of influence seems to be the emergence of migrant labour in response to increased labour demand and to rising expectations in the rural communities.

In Igabi village, inward and outward flow of migrants appear to correlate with the calender of activities of yam production. However, the remoteness of some centres like Dunki appeared to have constituted bottlenecks in the migratory flow of migrants and thereby modify the direct influence of yam production on this aspect of labour organisation.

The fourth and final statement of objectives is to examine ways by which the response of the farmer can be used for the plan of change in rural development.

The price analyses of crops and the model on the price relationship suggest that the revenue from yam production is the most favourable to the farmer. This appears to give the reason for the expansion of yam cultivation which has in turn led to increased labour demand. The new labour demand situation has attracted hired migrant labour whose presence has stepped up the demand for and the setting up of rural infrastructures. In response to this demand, the rural communities are putting up buildings (Tables 6.7 and 6.8) and letting rooms out to strangers, including migrant workers. The occupation of one room by four tenant migrants in the compound of Mallam Tanko in Fara Kwai village tends to suggest the need for more rented apartments in the village. It may also indicate the preparedness of tenants to share one room in order to reduce the rent per head. Transport services such as vans for transporting yam tubers and those offered by the 12-16 seater commuter buses link centres such as Igabi with neighbouring villages and urban centres. Table 7.3 shows that in 1980 alone eight motor vehicles were acquired in the area according to the questionnaire survey. These rural investments seem to indicate rural development and they appear to represent empirical expressions of the responses of the farmers to the new market opportunities.

One major way of using these responses for the planning of change in rural development is to strengthen the base of the rural development indicators which are peculiar to the area. And since the indicators have emerged in a spontaneous response to the new demand and supply situation in the rural economy, they are likey to have a high utility value and to lead to further development and growth of the rural areas.

Moreover, the effect of the remote location of Dunki in delaying the take-off of commercial yam production was noted above. Therefore another avenue of basing rural development plan on farmers' responses is to open more access routes and improve the standard of the existing ones. Effective links between rural centres and inter-urban routes will facilitate the movement of people and the evacuation of rural agricultural products. New farmlands are likely to be opened up for the expansion of farms and increases in agricultural production. Table 7.4 indicates that the higher the total population of each centre, the less the average size of plots and the less the average holding per farmer, and that the smaller the total population, the more the average size of plots and the more the average holding per farmer.

Table 7.3: Personal Expenditure in the Acquisition of Buses/Goods Van and Lorry in Igabi Fara Kwai and Dunki, 1980

Year	Number	Estimated Total Cost (in Naira)
1960-69	-	-
1970	1	5000
1971	-	-
1972	-	-
1973	1	3000
1974	2	7750
1975	1	1000
1976	1	900
1977	5	9600
1978	7	18000
1979	3	8901
1980	8	50332

Source: Same as in Table 6.2

Table 7.4: Total Population, Average Size per Farmer and Average Holding per Farmer of Yam Plots in Igabi, Fara Kwai and Dunki

Centres	Population	Average Size of Yam Plot (in ha.)	Average Holding per farmer (in ha.)
Igabi	5495	0.63	0.91
Fara Kwai	2508	0.7	1.28
Dunki	1014	1.24	2.06
All centres	9017	0.86	1.42

* Population is according to the 1963 Census figures. Federal Census Office, Lagos 1965.

Source: Field Survey May 1981-Jan. 1982

7.3 Assessment of Hypotheses

The two operational hypotheses of this project are stated in Chapter One. The first suggests that the expansion of yam production in the area is a function of the spontaneous response of the farmer to changing market opportunities. And since price is a function of changing market opportunities the suggested relationship may be seen as existing between the expansion of yam production in the area and the spontaneous response of the farmer to favourable

price changes. Two sets of data were earmarked for a rigorous test of this hypothesis: the area of land under yam cultivation over time and corresponding data on prices over the same period. Attempt to collect information on prices produced data which proved to be of little value to the exercise. For this reason, the test is based on inference.

It has been argued above that whereas the prices of yam, cotton and groundnut have risen over the years, only in the case of yam, does the price relationship appear to yield the highest revenue to the farmer (see Tables 5.1, 5.2 and hypothesis on price relationship). Since the price levels emerging from the price relationship are sustained only by market forces and opportunities, it could be inferred that the expansion of yam production in the area is a spontaneous responsiveness of the farmers to the market opportunities.

The second hypothesis proposes that the expansion of yam cultivation in the study area, is due to the decline in traditional export crops (cotton and groundnut). This proposal finds support in the analyses of land under the cultivation of the cash crops (Yam, cotton and groundnut). The analyses indicated that the relationship between the cultivation of yam and the other crops was expressed in the displacement of

cotton and groundnut. It also suggested that while the decline in cotton cultivation began from about 1965, the decline in the cultivation of groundnut began in 1970 and lasted until 1980. The decline in the cultivation of cotton would appear to be confirmed by the result of the partial correlation analysis for the three rural centres.

From the partial correlation result between yam plots and groundnut plots ($r_{xz.y}$), only in Fara Kwai does the correlation value of (-0.61) indicate an inverse relationship which suggests a decline in the cultivation of groundnut and a rise in that of yam. In the other two centres, the result indicates a high positive relationship. Therefore, the expansion of yam cultivation seemed to be due to the decline in cotton cultivation in the three centres, while it is only in Fara Kwai is the expansion of yam due to the decline in groundnut cultivation.

On the basis of the foregoing, the second hypothesis may not be sustained as it stands. The following situation appears to be the case: that the expansion of yam cultivation is due to the decline in cotton cultivation in all three rural centres, while it is due to the decline in groundnut cultivation only in Fara Kwai. The reason for the decline in question was attempted earlier in this thesis (See Tables 4.4, 4.5, 4.6 and the hypothesis on price relationship).

CHAPTER EIGHT

IMPLICATIONS OF STUDY, RECOMMENDATIONS AND CONCLUSION

8.1 Implications of the Study for Rural Development

That the Zaria rural communities are quick to appreciate profit opportunities and that they are responsive to changes under appropriate commercial inducements have far reaching implications for the development of rural Zaria.

From documentary and field survey sources, evidence has been advanced in the study to support the claim that the commercialisation of yam production in Zaria area led to a new labour demand situation. This in turn has given rise to longer hours of family labour and paid migrant workers. Local labour that would have moved in search of jobs elsewhere would tend to remain in situ under the new demand situation, all things being equal. The presence of this category of local labour and migrants would seem to have given rise to increased expenditures with particularity to the utilization of zinc roofs and cement floors (Tables 6.7 and 6.8). In both tables, it is evident that the rise in the number of properties began in 1970 and that more than 80% of the properties shown thereto were installed between 1970 and 1980. When it is recalled that the commercilisation of yam began around 1970

and that the period 1970-1980 falls within the commercial stage of this evolution, the influence of yam production upon these rural investments is strongly suggested.

These consumer goods point to the level of the material well-being of the rural communities while the total amount of money involved in the purchases points to the level of annual capital turnover in the rural economy. Moreover, the rural societies appear to have become more open and more receptive to strangers who can now buy land for farming and development purposes.

Since production is a key to development and since the rural producers have shown that they are adaptable to change and to the expansion of their mode of production, they can be expected to play very significant roles in rural development. If this is so, the question which immediately comes to focus is whether such spontaneous responses are sufficient to take care of rural development in Nigeria. This issue is considered next.

Due to the positive response of the Zaria rural societies to new market opportunities, rural Zaria has witnessed changes which are developmental in character. More jobs are created in farms as more land is brought under cultivation. There is

increased expenditure on income-yielding assets and marked increases in the number of consumer goods. However, whether or not the responsiveness in question is adequate for rural development will depend upon the level of development envisaged.

It would appear from the present study that transport vehicles are used in the trade between the rural and urban centres and in the movement of people and the evacuation of agricultural products to local bulk centres. However, the effectiveness of these motor vehicles in the performance of these functions will depend on the building of rural transport infrastructure. But due to the high cost of these infrastructure in terms of professional skills and capital outlay, they are beyond the capabilities of most rural communities to install. Thus it is the provision of rural infrastructure which will accelerate the process of rural development already set in motion that calls for planning. A relationship between the trend of rural responsiveness and the plan to accelerate rural development is, therefore, suggested. The next question, therefore, is how planners can take advantage of the above relationship in the plan for rural development.

The present study has shown that inspite of the rising Commodity Board prices for cotton and groundnut (Tables 5.1 and 5.2), the production of these

crops has been on the decline. This situation suggests that official price control and or price supports in themselves are not sufficient to induce increases in agricultural production among traditional farmers. It also stresses the fact that it is the relationship of prices rather than their absolute level which is important (F.A.O., 1967). This situation further lays claims to the fact according to Hogendorn (1970) that the rural farmer produces what it pays him to produce and that he is in the best position to decide what line of production to pursue. This decision represents part of the responsiveness in question.

Thus in order to take advantage of the reaction of rural societies in the plan for rural change, planners may adopt two broad strategies. The first may focus on the creation of a conducive atmosphere for the growth and operation of efficient marketing system. When as a result of this, a marked production process is established, then the second strategy may emphasise the building of rural infrastructures which will step up rural production capabilities along the established production lines. Such measures are the subjects of the recommendations which follow.

8.2 Recommendations

8.2.1 Maintenance of Market Efficiency

As was seen in the traditional marketing system in the study area, one major characteristic of efficient market is that the producers participate fully in the marketing of their products. This avails them of the opportunity of knowing which agricultural products yield the most favourable price relationship and therefore the highest relative profitability.

It will also appear that the efficiency of the traditional market coupled with increased urban demand is the basis of the market forces which induced the rural communities to change the pattern of their agricultural production. This in turn seemed to have led to the transformation of the rural economy. Based on the foregoing, the result of this project suggests that any form of official intervention such as price control in the traditional market is likely to erode the efficiency in question. This may in turn have a negative influence on the rural economy and reverse the process of rural transformation where such processes have set in.

Therefore, rather than interrupt the market system, it is recommended that measures such as the installations of effective linkages and road

connections in the rural areas be pursued. Such installations are likely to increase the frequency of contacts between the rural communities and the urban centres from which information and innovation generate. If the rural societies are better informed, their participation in the marketing of their products will be more beneficial to them.

8.2.2 Installation of Transport Infrastructure

The degree of inaccessibility of most of the study area is shown in Fig. 2. Of the three centres, only Fara Kwai on the Zaria-Kaduna highway has an efficient access route. The link with Dunki from the highway is only through footpaths while that with Igabi is via seasonal roads. Poor accessibility appears to impose two major set-backs on the production capabilities of the area.

Firstly, it hampers effective evacuation of farm products and effective distribution of agricultural inputs like chemical fertilizers and insecticides. Secondly, it limits the amount of land which is accessible for agricultural expansion. Fig. 2 shows that the area north and east of Igabi, east and south of Fara Kwai and those surrounding Dunki have no efficient access routes. Therefore it is likely that if roads are built through the remote areas, they will improve their accessibility level. New

farmlands in them are likely to be brought under cultivation while the hitherto marginal areas would be more intensively cultivated.

It is, however, recommended that the construction of such road network be based on related geographical factors foremost among which is the frequency of population distribution. This information is necessary in order that routes may be built to link population centres without directly interfering with existing settlements. There are other factors which need to be considered in the plan to improve the linkage system of the study area.

Fertile areas which have high potentiality for agricultural production will need to be included in the plan. But physical barriers such as Fara Kwai and Turunku Hills, flood plains and water courses may be avoided to reduce cost. However, while the position of the physical barriers may be known from the only available survey maps of 1964, such maps are inadequate in showing the present frequency of population distribution in the area. The old maps are not helpful in showing soil types either. These problems constitute setbacks in the present attempt to recommend the precise communication routes in this study.

8.2.3 The Handling and Storage of Yams

According to the prevailing storage practice in the area, yams are stored either in rooms or heaped in the open air and covered with dried vines. Associated with this practice are the problems of heat, pest attacks, insufficient storage space and leakages. Storage heat may arise from inadequate ventillation/which may lead to rot in tubers. Leakages cause dampness which may in turn shorten the shelf life of yams through decay. Storage problems which arise from heat, pest attacks and leakages can be controlled if the storage system is improved to allow sufficient ventilation, check leakages and make it pest proof.

Moreover, the life of stored yam may be prolonged through the process of curing. It involves the exposure of tubers to high temperatures and humidity for periods of about 24 hours after harvesting (Ikediobi, 1983). Curing is done to heal wounds inflicted on tubers during lifting, evacuation and other forms of handling. During the process, protective layers of dead cells develop and protect the whole yam from water losses and from infection.

However, the need for curing yams may not arise if there are no wounds on them. Wounds can be avoided if sufficient care is exercised during lifting and other operations which involve the movement of crop. Moreover producers need not store tubers which have damages but dispose of them soon after harvesting.

Dormancy in yams has been described as the period when the crop is metabolically quiescent. It spans the time between harvest and sprouting. After sprouting, yam tissues breakdown and the crop soon loses its food value. Dormancy, therefore, determines the length of the storage life of yams because during the period, respiratory activity is withheld and there is no food loss. The economic significance of dormancy lies in the fact that it can be shortened or prolonged. A prolonged dormancy or rest period extends the storage life of yams and enables producers to store their ware until market situations improve and prices rise substantially. On the other hand, if dormancy is shortened, uniformity of sprouting in yam seeds can be achieved and all-year-round production of yams or two yearly crops and better weed control may be achieved. The scientific processes involved in regulating the storage life of yams are beyond the scope of this project.

One main weakness in this study is that the relevant questionnaire (Appendix I) did not make provision for assessing the quantity of yams lost through storage problems. However, a personal interview of the present writer with leading farmers in the study area suggested on the average that for every ten donkey loads of yams stored under the present storage practice, between two and three donkey loads (or between 20% and 30%) are probably lost due to storage problems. It will also appear that the percentage of losses rises the longer the yams are stored.

Based on the above problems, this project points to the need to design a suitable storage model based on research findings. Such a model may make use of suitable wire netting which will allow free movement of air while it keeps out insects and related pests. Other features of the model may include suitable shelves for holding tubers, proper roofing to eliminate leakages and a shady surrounding to minimise heat. An attempt to design a model which answers the above features was made in the Department of Biochemistry, Ahmadu Bello University, Zaria.

The new model may be made available to rural producers who may then build their store houses to

incorporate the devices of the new system. Besides, a store house, based on the model can be built in each rural centre as part of the rural development plan. The store house may be managed by a local council which may apportion sections to farmers at moderate cost.

8.2.4 Input Distribution System

The building of road network as recommended in 8.2.2 above is likely to quicken the distribution of agricultural input. In addition however, this study points to the need for the setting up of a rural collecting centre where inputs may be stored for prompt distribution to the rural farmers.

8.3 Directions for Further Research

The findings of the present study point towards certain questions to which future research in the field might be directed.

8.3.1 The general responsiveness of the rural communities to new market opportunities has emerged as an important factor in spontaneous rural change. Further studies of this relatively neglected aspect of rural change might provide supporting evidence for the relative importance of this aspect of rural change as against directed or planned change.

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8.3.2 Further emerging from the study is the fact that while some yam plots were intercropped with other crops, other plots contained yam as sole crop. Moreover, it would appear that plots in which yams were planted as sole crops were much larger in size. A further research into this aspect of agricultural activities by the rural population might show the pattern of intercropping and sole cropping. Such evidence might provide an index for measuring rural responsiveness to commercial opportunities.

8.3.3 In terms of inter-regional trade in yams, there appears to be a notable shift in the pattern and direction of such trade. Observations suggest that while the initial stimulus to yam production in the Zaria area may have been local urban growth, a trade is now emerging to supply yams from this area to southern markets. This development represents a direct reversal of previous patterns. Further studies might shed useful light on the nature of changes which have been taking place in the location of markets for Zaria's yam production and consequent patterns of inter-regional trade.

8.3.4 From the present study, the labour situation of urban Zaria has suggested that this town is an important market for the yams of the area. Further studies of the

diet habit of the population of Zaria might point to other areas in the field of commercial food production.

8.4 Conclusion

The present writer strongly hopes that if implemented, the recommended measures are likely to make very significant contributions towards the development of rural Zaria in particular and other rural areas in general. The basis of the hope is to be found in the fact that the recommended measures are directed towards minimising current economic problems as well as stepping up the agricultural production processes which were already in operation among the rural communities.

A second reason is that this study has justified Boserup's (1965) claim that traditional societies are progressive and subject to agricultural evolutionary changes induced by population pressure. The Zaria rural communities have shown their dynamic responsiveness to changes in their mode of production under the inducement of growing market opportunities.

Although a small-scale development project (the Galma River Project) includes Igabi in its

area of coverage, opinions expressed in the village suggest that it has made little or no impact on the economic life of the village.

The relevance of this project here is that its apparent failure emphasises the need to relate rural development projects to existing production patterns of rural producers. Such prevailing pattern will represent the physical expression of the spontaneous reaction of the rural communities to any economic opportunity, planned or otherwise.

If rural development plans do not relate to the rural dwellers themselves in this way such plans are not likely to be effective. If however, they do, they (the plans) will relate to local resources such as labour, skills, land, seed and other production functions. And because of this relationship the plans are likely to involve a majority of the rural dwellers and success may be ensured through the participation of all. But it is the spontaneous reaction of the rural producers, which calls for careful study, that will reveal the character of the local resources upon which the development plan can be based. Herein lies the

significance of the rural spontaneous responsiveness. It represents the spontaneous factor which is essential in the plan for rural change and development to break the chain of rural poverty.

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APPENDIX I

YAM PRODUCTION AND EXCHANGE
QUESTIONNAIRE INTERVIEW FOR FARMERS

_____

_____

Date:

1. Village visited

1 = Igabi
2 = Fara Kwai
3 = Dunki

2. Age of Respondent

1 = 14-19	6 = 40-44
2 = 20-24	7 = 45-49
3 = 25-29	8 = 50-54
4 = 30-34	9 = 55-59
5 = 35-39	0 = 60 and above

3. Occupation of respondent

1 = farmer
2 = middleman/trader
3 = paid labourer

Family composition and labour force

4. How many wives do you marry:

0 = no wife
1 = 1 wife
2 = 2 wives
3 = 3 wives
4 = 4 wives
5 = more than 4 wives

5. State the number of wives in full time farm work

6. State the number of wives in part time farm work

7. State number of children over 15

8. State number of children under 15

9. State number of children in full-time farm work

10. Number of children in part-time farm work

11. Number of other relatives in full-time farm work

12. Which of the following activities do female members of your family participate in:

1 = Yes
2 = No

Ridge making (huda gona)

Planting (Shuka)

Weeding (Noma)

Harvesting/Packing (Girbi)

13. If family labour was inadequate and if you hired labourers (kwadago) during the last season, supply the following information.

Number of hired labourers for the following activities.

Ridge making

Weeding

Fertilizer application

Harvesting/Packing

14. What is the wage per labourer per day?

15. State of origin of hired labourers

1 = Kaduna State

2 = Other northern state

3 = Eastern States*

4 = Western States**

5 = Neighbouring W.A. countries

*Anambra, Imo, Cross River, River States
**Ondo, Oyo, Ogun, Bendel, Lagos States.

16. If you used communal labour last reason, indicate operations for which labour was used.

1 = ridge making (huda gona)

2 = planting (shuka)

3 = weeding (noma)

4 = Harvesting/packing (girbi

17. Total number of people involved in the communal

18. Total cost of hiring the communal labour

19. If there are times in the year when you would want to employ labourers but cannot find them, state which of the following farmwork for which labourers were not available:

    1 = ridge making (huda gona)

    2 = Planting (shuka)

    3 = Weeding (noma)

    4 = harvesting/packing (girbi)

20. If availability of labour is now more serious than 5 years ago, give reasons:

    1 = more people are involved in farming

    2 = out-migration of youngmen

    3 = dislike for farm work by youngmen

    4 = intensive cultivation requires more labour

    5 = influence of free primary education on youngmen

    6 = others

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LAND FACTOR

21. How many farm plots have you now?

22. How many years now since you have been farming?

23. How many plots of yams had you during the following periods?

20 years ago - 1960

15 years ago - 1965

10 years ago - 1970

5 years ago - 1975

2 years ago - 1978

Last year - 1979

This year - 1980

SECOND CARD _____

24. How many plots of cotton had you during the following periods?

20 years ago - 1960

15 years ago - 1965

10 years ago - 1970

5 years ago - 1975

2 years ago - 1978

last year - 1979

this year - 1980

25. How many plots groundnuts had you during the same periods:

20 years ago -11960

15 years ago - 1965

10 years ago - 1970

5 years ago - 1975

2 years ago - 1978

last year - 1979

this year - 1980

26. How did you acquire land for farming during the same periods?

20 years ago - 1960

15 years ago - 1965

10 years ago - 1970

5 years ago - 1975

2 years ago - 1978

last year - 1979

this year - 1980

Code:

1 = Inheritance (gado)
2 = Purchase (saya)
3 = Loan (aro)
4 = Hire (Haya
5 = Gift (Kyauta)
6 = Pledge (Jingina)

27. State the planting periods for the following crops

(a) Yams

1 = Feb/March
2 = March/April
3 = April/May
4 = May/June

(b) Cotton
1 = Feb/March
2 = March/April
3 = May/June

(c) Groundnuts
1 = Feb/March
2 = March/April
3 = April/May
4 = May/June

28. When do you harvest your tubers for early yams?

1 = June/July
2 = July/August
3 = August/Sept.
4 = Sept./October

29. When do you carry out normal (final) harvesting of yams?

1 = Aug./Sept.
2 = Sept/October
3 = Oct/November
4 = Nov/December
5 = Dec/January
6 = Jan/Feb.

30. When do you carry out the harvesting of cotton?

1 = Oct/November
2 = Nov/December
3 = Dec/January
4 = Jan/February

31. When do you carry out early harvesting of groundnuts?

1 = June/July
2 = July/Aug.
3 = Aug/Sept.
4 = Sept/Oct.

32. When do you do the late harvesting?
1 = Sept/October
2 = Oct/November
3 = Nov/December
4 = Dec/January
5 = Jan/February

THIRD CARD

33. If you co trolled weeds in plots growing any of the following crops, indicate method used.

Yams
Cotton
Groundnuts

Code:
1 = hand weeding
2 = mechanical weeding
3 = chemical weeding

34. If no weeding was done on any plot, give reasons.

1 = shortage of labour
2 = lack of cash
3 = not much weed

PEST/DISEASE CONTROL

35 (a) If there was any pest/disease attack state nature of attack on the following crops:

Yams
Cotton
Groundnut

Code:
1 = rot, rodent, termite/ants
2 = warms, beetles weevils
3 = birds

(b) If there was attack, state whether it was before or after harvesting in respect of understated crops:

Yams
Cotton
Groundnut

1 = before harvesting
2 = after

36. (a) If you used any of the following chemicals in respect of yams state whether full or part extent

DDT
Endrin
Endrex
Gammaxene

Code:
1 = full extent
2 = part extent

(b) If you used any of the chemicals in respect of the cultivation of cotton, show whether full or part extent.

DDT
Endrin
Endrex
Gammaxene

Code:
1 = full extent
2 = part extent

(c) If you used any of the chemicals in respect of groundnut cultivation state whether full or part extent.

DDT
Endrin
Endrex
Gammaxene

Code:
1 = full extent
2 = part extent

37. If you controlled pest/disease, where did you obtain chemicals/sprayers?

1 = min. of agric.
2 = co-operative shop
3 = extension service
4 = others

38. If pesticides were not used, give reason

Code:
1 = no knowledge about this
2 = no money
3 = not available locally
4 = not much pest/disease attack
5 = others

Fertilizer/Manure Application

39. (a) If you used any of the following media in respect of yam cultivation, state extent (full or part extent).

Ammonium sulphate
Urea
Rock/Super sulphate
Potash
Animal/Compost manure
Mixtures
Others
Code: 1 = full extent
2 = part extent

(b) State the number of applicable of the media in respect of yam cultivation

Ammonium supphate
Urea
Rock/Super sulphate
Potash
Animal/Compost manure
Mixtures
Others

Use code as in 39(b) above.

40. (a) If you used the following media in respect of cotton cultivation, state the extent

Ammonium sulphate
Urea

Rock/Super sulphate

Potash

Animal/Compost manure

Others

Code:
1 = full extent
2 = part extent

(b) State number of application in respect in cotton.

Ammanium sulphate
Urea
Rock/super sulphate
Potash
Animal/Compost manure
Others

41. (a) If you used the media in respect of groundnut cultivation, indicate the extent.

Ammanuim sulphate

Urea

Rock/sulphate

Postash

Animal/Co post manure

Others

Code:

1 = full extent

2 = part extent

FOURTH CARD

42. Where did you obtain fertilizer?

1 = min. of agric

2 = co-operative shop

3 = local market

4 = others

STORAGE

43. State the storage system you use in respect of yams

1 = underground storage (rumbu)

2 = tubers tied in barns

3 = store rooms

4 = stacked in the open & covered with dead plant materials

5 = others (specify)

44. State the storage system you use in respect of cotton.

1 = store room

2 = bags stacked in the open & covered up

3 = others

45. State the storage system you use in respect of gr. nuts

1 = store room

2 = bags stacked in the open & covered up.

3 = others

46. If you experienced any problems arising from the nature of storage indicate.

1 = heat (rot)

2 = pest attack

3 = insufficient storing space

4 = leakages

5 = others.

47. If you did not have adequate storage facilities, give reason

1 = lack of cash

2 = others

CHANGE IN CROPPING SYSTEM

48. (a) If you stopped planting yams since you started farming, state when you last planted them

(b) Give reasons for stopping
Code:

1 = high labour demand by crop

2 = low relative yields

3 = easily attacked by pest/disease

4 = poor marketing arrangement

5 = difficult storage system

6 = low prices

7 = others

49. (a) If you stopped planting <u>cotton</u> since you started farming, state when you last planted it.

(b) If the stop was partial, how many plots were involved?

(c) Give reasons for stopping. Use code as in 48 (b) above.

1

2

3

4

5

6

7

50. (a) If you stopped planting <u>gr. nuts</u> since you started farming, state when you last planted the crop.

(b) If the stop was partial, how many plots were involved?

(c) Give reasons for stopping. Use code as in 48(b) above.

1
2
3
4
5
6
7

CAPITAL

51. (a) State the implements used for the following farm operations in respect of yams

Bush clearing

Ridge making

Planting

Weeding

Manuring

Harvesting

Code:

1 = cutlass, digger
2 = hand hoe
3 = ox-plough
4 = hired tractor
5 = others

(b) State the implements used in respect of cotton in the following operations.

Bush clearing

Ridge making

Weeding

Manuring

Harvesting

Use code as in 51(a) above.

(c) State the implements used in these operations in respect of gr. nuts.

Bush clearing

Ridge making

Weeding

Manuring

Harvesting

Use code as in 51(a) above.

52. If you gired tractor last season

(a) State total number of hours for which tractor was hired

(b) Cost of hire <u>per hour</u> ₹

FIFTH CARD

(c) In respect of which crops?

1 = Yams

2 = Cotton

3 = Gr. nuts

53. What were the total investment in cash you made last season on each of the following crops?

Yams

Cotton

Gr. nuts

54. (a) Did you obtain credit/loan for farming last season?

1 = Yes
2 = No

(b) How did you raise the loan?

1 = min of agric.

2 = bank

3 = co-operative

4 = money lender

5 = relative/friends

6 = others

(c) What was the amount of the loan?

(d) How much did you pay as interest?

(e) What was the duration of the loan (years).

(f) What was the nature of repayment

1 = cash
2 = kind

55. If you had difficulties in repaying the loan, give reasons:

1 = poor harvest

2 = falling prices of crops

3 = unfavourable govt. policy

4 = others

TRANSPORT

56. (a) How many donkey loads of yams did you transport last season during the rainy and dry seasons

rainy season

dry season

(b) State the major means of transport used:

1 = human porterage
2 = donkey
3 = bicycles/motor-cycle
4 = vehicles (lorry, van etc)
5 = rail
6 = others

(c) State main destination to which yams were transported:

1 = Zaria, Kaduna
2 = Sokoto, Daura Kano
3 = Zaria-Kaduna Roadside markets
4 = Southern towns, Lagos
5 = Local markets
6 = Others

(d) State total cost of transporting yams last season

57. (a) State quantity (No. of bags) of cotton transported last season

(b) State one major means used in transporting them.

1 = human porterage
2 = donkey
3 = bicycles, motor-cycle
4 = vehicles
5 = rail way
6 = others

(c) State main destination to which cotton was transported:

1 = Zaria
2 = Funtua
3 = Local markets
4 = Others

(d) State total cost of transporting them

58. (a) State quantity (No. of bags) of Gr. nuts transported last season

(b) State one major means used in transporting them

1 = human porterage
2 = donkey
3 = bicycle, motor-cycle
4 = vehicles
5 = rail
6 = others

(c) State main destination to which Gr. nuts were transported

1 = Zaria, Kaduna, Funtua
2 = Sokoto, Kano, Maiduguri
3 = Lagos & Southern towns
4 = Local markets
5 = Others

SIXTH CARD

(d) State total cost of transporting the gr. nuts.

FARM PRODUCTS & MARKETING

59. Supply the following information in respect of yams.

yield per acre (no. of donkey lds)

total produced (" " " ")

total value (cash)

sold for cash

60. Supply the following information in respect of cotton.

yield per acre (no. of bags)

total produced (" " ")

total value (cash)

sold for cash

61. Supply the following in respect of gr. nuts

yield per acre (no. of bags)

total produced (" " ")

total value

sold for cash

62. Indicate major market channels through which you sold yams and supply the accompanying information.

(a) Local market.

i. quantity (donkey loads)

ii. value

(b) Middlemen

i. quantity (donkey loads)

ii. value

(c) Roadside markets

i. quantity (donkey loads)

ii. value

(d) Government Agent (specify)

i. quantity (donkey load)

SEVENTH CARD

ii. value

63. Show which of the following market channels you sell cotton and supply the needed information.

(a) Local market

i. quantity (no. of bags)

ii. value

(b) Buying Agents

i. quantity

ii. value

(c) Marketing Board

i. quantity

ii. value

64. Show which of the following market channels you sold gr. nuts and supply the information which follows:

(a) Local market

i. quantity

ii. value

(b) Buying Agent

i. quantity

ii. value

(c) Marketing Board

i. quantity

ii. value

MARKET AND MARKET PERIODICITY

65. Supply the following information on local market in your area.

(a) distance from home (miles)

(b) frequency of meeting

1 = daily
2 = twice weekly
3 = once weekly
4 = once forthnightly

(c) Crops sold

1 = yams, cotton
2 = yams, gr. nuts
3 = cotton, gr. nuts
4 = yams, cotton, gr. nuts

66. Personal Expenditure/Goal Perception

As a farmer if you have any of the following goods, supply the accompanying information

(a) Car/Lorry

i. Year acquired

ii. No. owned

iii. Total cost

(b) Motor-cycle

i. Year acquired

ii. No. owned

iii. Total cost

(c) Sewing Machine

i. Year acquired

ii. No. owned

iii. Total cost

(d) Bicycle

i. Year acquired

ii. No. owned

iii. Total cost

(e) Cement floor

i. Year acquired

ii. No. of rooms

iii. Total cost.

(f) Zinc roof

i. Year acquired

ii. No. of houses

iii. Total cost

(g) Ox-plough

i. Year acquired

ii. No. owned

iii. Total cost

(h) Radio

i. Year acquired

ii. No. owned

iii. Total cost

(i) TV Set

i. Year acquired

ii. No. owned

iii. Total cost

(j) Horse

i. Year acquired

ii. No. owned

iii. Total cost

NINTH CARD

(k) Others (specify)

i. Year acquired

ii. No. owned

iii. Total cost

67. If any of your children attend any of the following understated institutions, please supply the needed information.

(a) Koranic School

i. Year

ii. No. in attendance

iii. Expenditure

(b) Primary School

i. Year

ii. No. in attendance

iii. Expenditure

(c) Secondary/Tech. School

i. Year

ii. No. in attendance

iii. Expenditure

(d) ATC/Col. of Technology

i. Year

ii. No. in attendance

iii. Expenditure

(e) University

i. Year

ii. No. in attendance

iii. Expenditure

68. State the most important goals for which you now need money.

1.

2.

3.

69. Sex of respondent

1 = male
2 = female

APPENDIX II

Yam Production & Exchange - Labour Movement Interview

[ ][ ][ ][ ][ ] 1-5

Date:

1. Village Visited

   1 = Igabi
   2 = Fara Kwai
   3 = Dunki

   [ ] 6

2. Age of respondent

   1 = 14-19 4 = 30-34 7 = 45-49
   2 = 20-24 5 = 35-39 8 = 50-54
   3 = 25-29 6 = 40-44 9 = 55-59
   0 = 60 & above

   [ ] 7

3. Sex of respondent

   1 = male
   2 = female

   [ ] 8

4. Respondents State of Origin

1 = Kaduna	11 = Oyo
2 = Kano	12 = Ondo
3 = Sokoto	13 = Ogun
4 = Bauchi	14 = Bendel
5 = Bornu	15 = Anambra
6 = Benue	16 = Imo
7 = Plateau	17 = Cross River
8 = Gongola	18 = Rivers
9 = Niger	19 = Lagos
10 = Kwara	20 = Neighbouring W.A. Countries (Specify which)

[ ][ ] 9-10

Information in this section may apply to either the present or past seasons (years). Please indicate which year information is in respect of.

5. Which of the following farm works were you employed to do?

   1 = ridge making (huda gona)

   [ ] 11

   2 = olanting (shuka)

   [ ] 12

3 = weeding (noma) 13

4 = harvesting/packing (girbi) 14

6. What was/is your pay per day

15-18

7. Which tool(s) do you use for the following farm works:
ridge making (huda gona) 19

planting (shuka) 20

weeding (noma) 21

harvesting/packing (girbi) 22

1 = hand hoe
2 = digger
3 = cutlass
4 = ox-plough

8. Which of the following alternatives was the main means of your movement from home to the present working place?.

1 = foot, bicycle
2 = foot, public transport, rail
3 = foot, rail, private transport (cars, Motor-cycle)
4 = foot, public transport, private transport, rail
5 = others

23

9. Which of the transportation means did you find most convenient?

1 = foot
2 = bicycle
3 = public transport (bus, taxis etc)
4 = private transport
5 = rail

24

10. What was the nature of your movement?

1 = work in one place, proceed to another when work is finished: finally return home when farm work is over the same year.

2 = travel to one place each year. Working there & returning home when farm work is over the same year.

3 = move with family & belongings as in 1

4 = move with family & belongings as in 2

5 = stay more less permanently and engage in paid farm work and return home after some years.

6 = others (specify)

[ ] 25

11. If you were here last year, for how many months did you stay doing farm work?

0 = 1 month
1 = 2 months
2 = 3 "
3 = 4 "
4 = 5 "
5 = 6 "
6 = more than 6 months

[ ] 26

12. When did you arrive here last season for farm work?

1 = Jan.
2 = Feb.
3 = March
4 = April
5 = May
6 = June
7 = July
8 = August
9 = Sept.
10 = Oct.
11 = Nov.
12 = Dec.

[ ][ ] 27-28

13. When did you return to your home last season?

1 = Jan.
2 = Feb.
3 = March
4 = April
5 = May
6 = June
7 = July
8 = Aug.
9 = Sept.
10 = Oct.
11 = Nov.
12 = Dec.

[ ][ ] 29-30

14. What accommodation arrangements did you make during your stay in the place last season?

1 = rented room
2 = free room given by employer or friend
3 = lived with friend/relative
4 = had no specific dwelling
5 = others

[ ] 31

15. If you paid for your accommodation, what was the monthly rent you paid?

					32-36

16. If you had any problems in the working place as a stranger, state the nature of the problems.

1 = unfriendliness of the natives
2 = problem of water supply
3 = accommodation problem
4 = religious intollerance
5 = others

	37

17. What do you do when farm works are all over (i.e off season work)?

1 = Travel to town to work (which town)?
2 = Travel south to work in platations
3 = Travel south to work at the ports (which)?
4 = Engage in off season work e.g. building
5 = Go to work in mines(specify which?)
6 = Others (specify)

	38

18. If you engaged in off season work, what was your daily wages?

					39-43

19. If you had other reasons besides the income incentive for going to specific area to work, indicate.

1 = Because relatives live there
2 = Had been there before, therefore Knew how to get there.
3 = Not too far from home
4 = Others

	44

(a)
20. /Do you have other sources of income not mentioned above?

1= Yes
2= No

	45

(b)
If yes what were/was the nature of the income sources?

1 = Trading
2 = Local craft (dyeing, carving, leatherworks, smithing, mat making).
3 = Cottage industry (watch, shoe and bicycle repairs).
4 = Tailoring
5 = Others

(c) What was your total income last year?

46-50

Personal Expenditure/Goal Perception.

21. As a farm labourer, if you ownmany of the following goods, please supply the required information:

(a) Motor

i. Year acquired 19 51-52

ii. Number owned 53

iii. Total cost 54-58

(b) Bicycle

i. Year acquired 19 59-60

ii. Number owned 61

iii. Total cost 62-66

(c) Sewing machine

i. Year acquired 19 67-68

ii. No. owned 69

iii. Total cost 70-74

(d) Cement floor

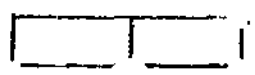
i. i. Year acquired 19 75-76

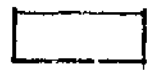
ii. No. of rooms 77

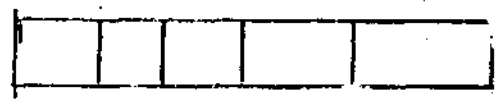
2ND CARD

iii. Total cost 6-10

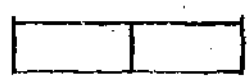
(e) Zinc Roof

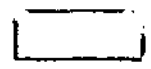
i. Year acquired 19  11-12

ii. No. of houses  13

iii. Total cost  14-18

(f) Radio

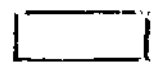
i. Year acquired 19  19-20

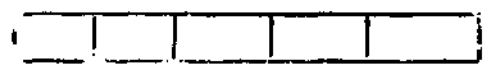
ii. No. owned  21

iii. Total cost  22-26

(g) Television Set

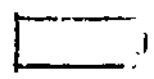
i. Year acquired 19  27-28

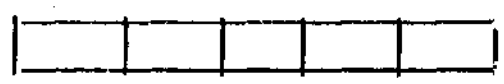
ii. No. owned  29

iii. Total cost  30-34

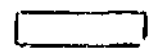
(h) Others (specify)

i. Year acquired 19  35-36

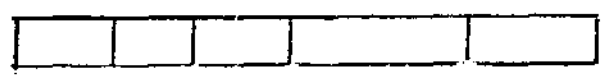
ii. No. owned  37

iii. Total cost  38-42

22. (a) Do you have any children in school

1 = Yes
2 = No  43

(b) If yes how much do you spend on their education annually?

 44-48

Yam Production & Exchange - Middlemen Questionaire Survey

Date: [ ] 1-5

1. Village visited

   1 = Igabi
   2 = Fara Kwai
   3 = Dunki [ ] 6

2. Age of respondent

   1 = 14 -19 4 = 30-34 7 = 45-49
   2 = 20 -24 5 = 35-39 8 = 50-54
   3 = 25 -29 6 = 40-44 9 = 55-59
                          0 = 60 & above [ ] 7

3. Sex of respondent

   1 = male
   2 = female [ ] 8

4. a. Respondents state of Origin [ ] 9

   1 = Kaduna
   2 = Kano
   3 = Sokoto
   4 = Bauchi
   5 = Bornu
   6 = Benue
   7 = Plateau
   8 = Gongola
   9 = Niger
   10 = Kwara
   11 = Oyo
   12 = Ondo
   13 = Ogun
   14 = Bendel
   15 = Anambra
   16 = Imo
   17 = Cross River
   18 = Rivers
   19 = Lagos
   20 = Neighbouring W.A. Countries (Specify)

   b. Local Government area or home town/village _____

This Section pertains to last and present seasons.

5. During the planting season, what is the price of a donkey load of yeams at the following places/levels.

   a at the farm ₦ [ ] 10-14

   b at the local/road side Market₦ [ ] 15-17

   c at the urban market ₦ [ ] 20-24

   d indicate which urban centre

   1 = Zaria
   2 = Kaduna
   3 = Funtua
   4 = Gusau
   5 = Sokoto
   8 = Maiduguri
   9 = Bauchi
   10 = Gombe
   11 = Numan
   12 = Yola. [ ] 25

6 = Katsina
7 = Kano
13 = Ilorin
14 = Makurdi
15 = Other Northern towns
16 = Lagos
17 = Other Southern towns

6. During growing season, what is the price of a donkey load of yams at the following places/levels

a at the farm ₦ 26-30

b at the local/road side markets ₦ 31-35

c urban market ₦ 36-40

d indicate which urban centre use code as in 5 (d) above. 41

7. During early harvest, what is the price of a donkey load of yams at the following place/levels.

a at the farm ₦ 42-46

b local/road side markets 47-51

c urban market ₦ 52-56

d indicate which urban centre. Use code as in 5 (d) above 57

8. During late harvest, what is the price of a donkey load of yams at the following place/levels.

a at the farm ₦ 58-62

b local/road side markets ₦ 63-67

c urban market ₦ 68-72

Use code as in 5 (d) above 73

9. a. As a middleman, state the quantity (no, of donkey loads) of yams you handled last season 74-77

2nd Card 1- 1-5

b. How many donkey loads were produced from local farms 6-9

10. a. Of the total quantity of yams you handled last season, how many donkey loads came from non-local sources? 10-13

b. State the non-local sources

_____

11. As a respondent, it is assumed that one of your primary occupations is that of a middleman. Mention other occupations you engage in

_____

12. Where do you live (town or village)

_____

13. As a middlemen, if you own any of the following goods, please supply the required information.

a. Car, van bus, lorry

i. year acquired 19 14-15

ii. no. owned 16

iii. total cost ₦ 17-24

b. Motor-cycle

i. year acquired 19 25-26

ii. no. owned 27

iii. total cost ₦ 28-33

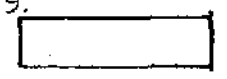
c. Bicycle

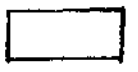
i. year acquired 19 34-35

ii. no. owned 36

iii. total cost ₦ 37-42

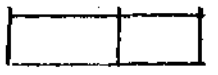
d. Sewing machine.

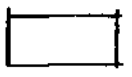
i. year acquire 19  43-44

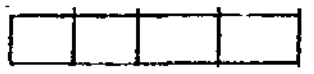
ii. no. owned  45

iii. total cost ₦  46-51

e. Cement floor

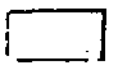
i. year acquired 19  52-53

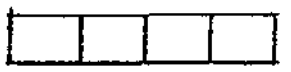
ii. no. of rooms  54

iii. total cost  55-60

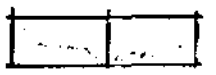
f. Zinc roof

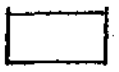
i. year acquired 19  61-62

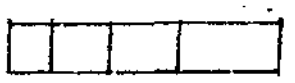
ii. no. of houses  63

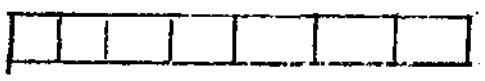
iii. total cost ₦  64-69

g. Concrete building

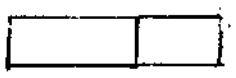
i. year acquired 19  70-71

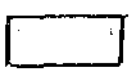
ii. no. owned  72

iii. total cost ₦  73-80

3rd Card  1-5

h. Radio

i. year acquired 19  6-7

ii. no. owned  8

iii. total cost  9-14

i. Television Set

i. year acquired 19 [ ][ ] 15-16

ii. no. owned [ ] 17

iii. total cost [ ][ ][ ][ ] 18-23

j. Others(Specify)

i. year acquired 19 [ ][ ] 24-25

ii. no.owned [ ] 26

iii. total cost ₦ [ ][ ][ ][ ] 27-32

14. (a) Do you have children in school?

1 = yes
2 = no [ ] 33

(b) If yes how much do you spend on their education annually?

₦ [ ][ ][ ][ ][ ] 34-39

15. State the most important goal for which you now need

1 = marry
2 = buy motor-cycle, bicycle
3 = radio, T.V.
4 = build house
5 = buy land
6 = pilgrimage (hajj)
7 = buy car
8 = other (specify) [ ] 40

16. How do you get information generally including that on yam prices.

1 = radio, T.V.
2 = Newspapers, magazines
3 = travellers
4 = friends/relatives
5 = at local markets
6 = others (specify) [ ] 41

APPENDIX IV

Questionnaire on Urban Zaria.

1. Name of Establishment: _____

2. Date of Establishment: _____

3. Nature of Services rendered. (Please tick those applicable).

   a) Transportation ____

   b) Manufacturing and processing ____

   c) Medical services ____

   d) Educational ____

   e) Banking ____

   f) Agricultural ____

   g) Retail trade ____

   h) Fuel supply (petrol station ____

   i) Cottage services e.g. tailoring, shoe/watch repairs, washing and dry cleaning ____

   j) Motor services and repairs ____

   k) Others (please specify) _____

   _____

4. Total number of people employed when first established: _____

   If an institution please indicate the number of staff (academic and clerical and administrative) and students on roll:

   Number of Staff _____

   Number of students _____

5. Total number of people employed now _____

6. Year when the highest number of people were employed: _____

   Number in employment that year _____

7. In your opinion, do you consider that Zaria is making a satisfactory growth as an urban centre? (tick which is applicable)

Yes_____ No_____

8. If No please suggest reasons if any:

_____

_____

_____

_____

_____