THE ROLE OF GINGER PRODUCTION IN THE RURAL ECONOMY OF J ABA AND KACHIA LOCAL GOVERNMENT AREAS OF KADUNA STATE

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DECLARATION

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

.... 3/3/94 ....

SIGNATURE DATE

CERTIFICATION

This Thesis entitled: "The Role of Ginger Production in the Rural Economy of Jaba and Kachia Local Government Areas of Kaduna State", by WENDOCK, BETHOLI NOAH, meets the regulations governing the award of Masters of Science (M.Sc.) Degree in Rural Development, Post-Graduate School, Ahmadu Bello University, Zaria, and is hereby approved for its contribution to knowledge and literary presentation.

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DEDICATION

This work is dedicated to Mr. Yakubu Doye Nangwang Chori, for being the most influential person in my life over the years.

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ABSTRACT

This study is on the role of ginger production in the rural economy of Jaba and Kachia Local Government Areas of Kaduna State. It tries to examine the processes of production and marketing of ginger in relation to its role on the producers' income and people of the immediate surrounding.

After tracing the processes of production and marketing of the crop from producers through intermediaries to the exporters and/or consumers, the study uses inferential methods to analyse the role of the crop in the economy of the people.

It demonstrated that income is highly dependent on the fields of people's investment. And that certain forces, it would seem, combined to prevent the farmers from making meaningful profit from the gradual price increase for the crop. A working hypothesis was basically formulated to test the validity of these assertions. The main question being 'Who is actually benefiting from the present high prices of ginger in particular and agricultural prices in general?'.

The empirical result of the study shows that ginger production in the study area has been increasing quite remarkably. The study also shows that there has been fluctuation in the prices of the crop, but the amplitude of fluctuation being more during season of scarcity and less during season of harvest. Thus, orderly marketing through procurement, buffer stocking, and public distribution, deserve serious consideration. The study also shows that although the prices received for the ginger produced have increased over the years, where farming operations are costed, prices paid by the farmers for farm inputs have increased much more.

Moreover, the marketing intermediaries make excess profit at the expense of the producers. As a result, ginger farmers within the study area were actually not benefiting from the recent high prices for the crop. The contribution of ginger to the income of the producers could only be seen from the fact that most of its farming operations were carried out at those times the farmers were less engaged in the farming operations of other crops. The unfavourable price parities, if continued for long, may prove as a disincentive for the producer - discouraging further increase in ginger production.

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CHAPTER I

INTRODUCTION

1.1 THE RESEARCH PROBLEM

It has been observed by Hill (1970), Hopkins (1973) and Adalemo (1978) that Nigerian farmers have gone past the stage of pure subsistence production. They now produce commodities delibrately for sale to consummers outside the immediate production area despite the fact that the production unit in majority of cases is still small and not specialised.

In Jaba and Kachia Local Government Areas of Kaduna State, Ginger (Zingiber Officinale roscoe) is produced along side other crops. Although it has a long history of existence in the study area, its production in large commercial quantity vigorously started when an investigation was carried out by the British colonial administrators to find a crop that would generate income (to help in tax payment) and internal trade for the people of Southern Zaria. Before this time, ginger has been cultivated in small quantity in the study area as a backyard crop for sale to Hausa traders, and this provided the nucleus for expansion (Gibbon, 1953; James, 1987).

According to Bagy (1991), the colonial masters decided to promote ginger production to all the ethnic groups in Southern Zaria. For some reasons all the ethnic groups but Ham people (the largest ethnic group within the study area) refused to grow ginger. These other ethnic groups regarded the introduction of ginger production as "another clever design by the Emir of Zaria to introduce another form of slavery"; therefore they refused to embrace ginger production.

On the other hand, the Ham communities who had been habitually growing ginger regarded its production as a source of income and simply intensified their production (as directed by the colonial masters) there by giving rise to the production of ginger in Southern Zaria and Nigeria as a whole. They have remained the dominant producers of this crop in the country, placing Nigeria as not only the largest producer in Africa but also one of the world's five leading countries in ginger production (Tarah, 1978).

The process of ginger production - from preparation of farm site, manuring, ploughing, harrowing, planting, mulching, weeding, harvesting, storage, to preparation for marketing (peeling or splitting of the rhizomes), etc., is very labour intensive and costly. Tarah (1978) observed that farmers start preparation for the following planting season as early as November. The last rains of October are used for the tilling ('Kabtu' in Hausa) of land meant for the next planting season. Cutting of grasses for mulching starts in December and lasts till planting is over in May. The first rains in March or April are used for the harrowing of the ploughed land and planting of the crop. Weeding, which is done by picking the weeds by hand starts a month after planting and continues for about four months. Harvesting is done by careful digging of the rhizome and removing the roots and leaves by hand, while preparation of the crop for marketing is done through peeling of the scale or splitting the rhizome into halves and drying it in the sun. And, the ginger produced in the area is rated as a "very high quality" one (Turu, 1987; Tarah, 1989; Bagy, 1991). Yet, James (1987), Ibrahim (1985), Tarah (1989); Musa (1990) and Bagy (1991) asserted that the crop is being sold far below expectations.

According to Turu (1987), data on current out-put of ginger are not much available because the government is not aware of how much is being produced or traded. The Nigerian Groundnut Board which was charged with the responsibility of buying and marketing of ginger was not able to buy any ginger from farmers from 1980 because of the poor prices it offered compared to open market prices. Kari-Kari and Musa (1985) observed that there is no conscious effort on the side of the government to revive the ginger trade to a reasonable standard. For, even "the recent attempt made by the government at reviving the production of cash crops in the country did not consider ginger at all". James (1987) stressed that it is suspected that the price of ginger is normally fixed at ridiculously low levels to enable private dealers offer relatively higher prices and thus control the marketing of the crop illegally. He further pointed out that ginger as a cash crop must be having some production problems, but that inspite of its many years of exposure to international market, no meaningful researches have been conducted to improve on its production methods, yields, storage, and marketing. Instead, "whatever quantity is produced, some wealthy shylocks are hanging around to grap it from the producers at the lowest price possible without considering production cost."

Reports show that ginger production has been increasing quite remarkably. So many farmers in the study area - over 65% (Ibrahim, 1985) grow ginger. There has been a continuous increase in production at about 10% yearly. Since 1928/29 when the first shipment trial of ginger overseas was carried out, the export of the crop has been increasing between 5% and 10% per year (Turu, 1987; Ibrahim, 1985; Bagy, 1991). Recent provision of improved farm inputs, credits and extension services to small scale farmers has gradually resulted in increased agricultural output (ginger inclusive). Although prices offered do not seems to meet production cost (Ibrahim, 1985; James, 1987; Tara, 1989; Musa, 1990; and Bagy, 1991), the present economic depression and its resultant inflationary trends coupled with the introduction of the Structural Adjustment Programme (SAP) has led to general rapid increase in the prices of agricultural commodities, including ginger. Rapid increase in production led to both the establishment of a ginger processing industry in Kachia in 1986 and the birth of a news magazine in 1987 with a name "The Ginger" - Kachia Local Government quarterly magazine - which centres on ginger.

The validity of the increase in production and prices is be ng questioned by well-meaning Nigerians who continue to ask the question: To what extent has the present increase in ginger production led to increase in farmers income?". The way commodities are sold play an important role in determining what the consumers pay for them and what the farmer gets at the end of each harvest. Prices of ginger seems to change constantly, and certain forces, it appears, combine to manipulate such prices to the disadvantage of the farmers. Despite the intensive labour input and divergence from concentrating on other crops, the farmers do not appear to be progressively better off. For instance, Anaebonam (1992) has this to say in one of the daily newspapers:

> Recently, some groups of businessmen have taken over the functions of scrapped commodity board by constituting themselves into international compradors, meant to market produce from the farmers. Like putting the cart before the horse, who is the farmer whose produce is being priced? What produce? ------ Ironically, the peasant farmers have been at a cross road over the disposal of their crops profitably---- --- Some experts have argued that the establishment of a commodity exchange (COMEX) will allow the farmer to obtain a good price for his produce. Of what use is a COMEX that will not give loans or make any material input to the success of the farmers but only interested in mopping up produce from all over the country for expropriation? (Daily Champion, 18/2/92).

It is against this background that this research examined the mode of production and marketing pattern of ginger in relation to the pricing system and its effect on farmers and local middlemen's income in Jaba and Kachia Local Government Areas of Kaduna State. That is, the task was to examine whether there is surplus value in material form over what is invested for the satisfaction of the people's needs and for future investment. In particular, the various processes of production, namely: land clearance, tilling, harrowing, planting, mulching, weeding, havesting, peeling or splitting, etc. were considered vis - a - vis the question of whether recent increase in prices of the crop has helped to increase the income of the people.

However, consideration was given / to some physical facilities of the area - particularly transportation system - which play pre-requisite role of an efficient production and marketing system. Physical facilities, in addition to institutional and legal support contribute to safe and economical handling of farm inputs and produce (Indachaba, et al. 1981).

Unfortunately, not many studies have examined ginger production in relation to income and general welfare of farmers. Concentration has for long been on increasing productivity of the farmers overlooking the important aspect of income generated from the produce for the general welfare of the producer. This study attempts to fill the gap.

1.2 STUDY AIM AND OBJECTIVES

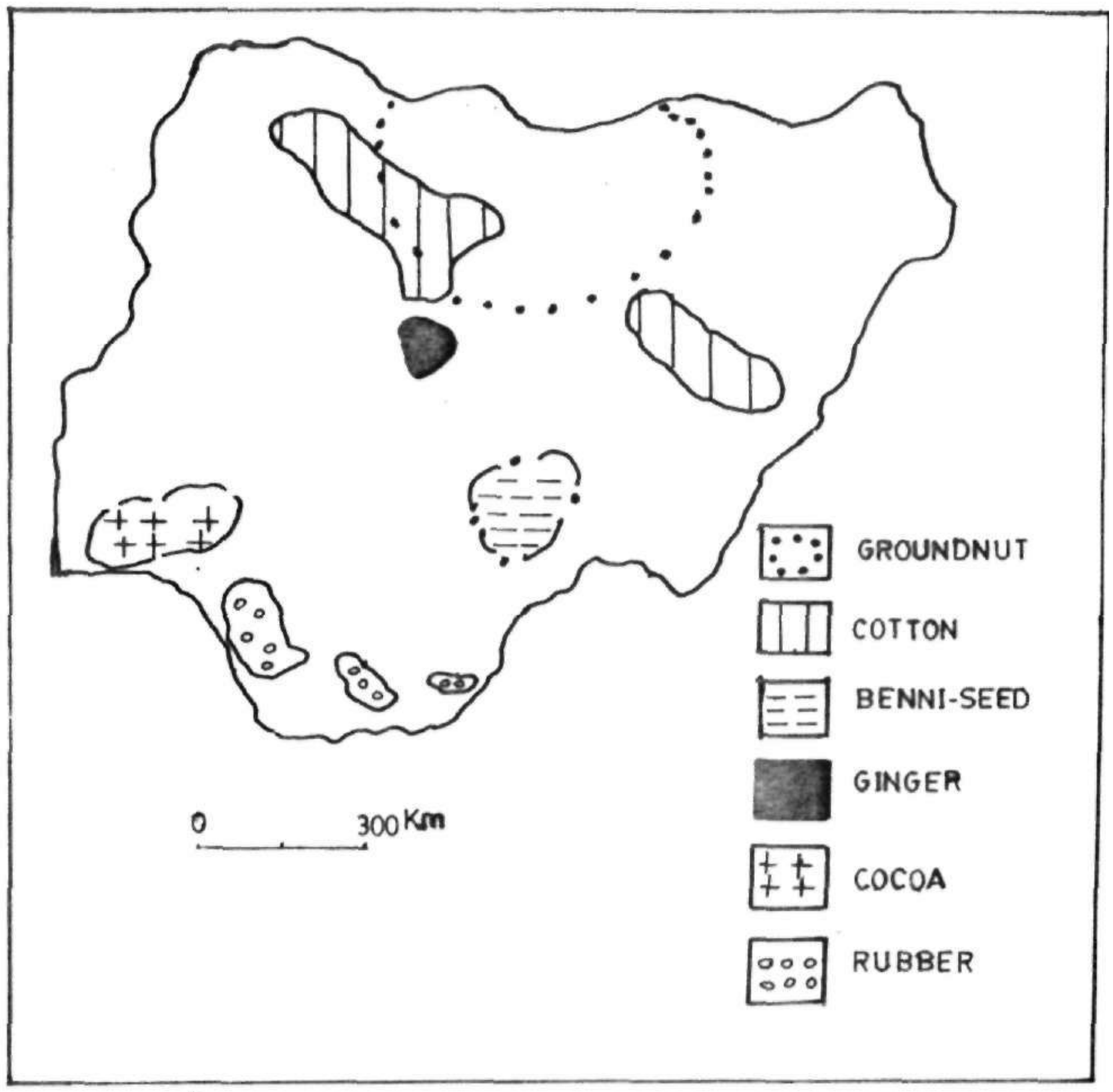
The main aim of this study is to examine the contribution of ginger production to the improvement of the local economy of the producing communities. To be able to do this, the following specific objectives are pursued:

(a) To examine the methods and levels of ginger production.

(b) To analyse changes in input - output price relationship over time.

(c) To examine the contribution of ginger production to employment and income generation.

FIG.1. NIGERIA: SOME MAJOR CASH CROPS



SOURCE: OXFORD/PHILIP: NIGERIA PRIMARY ATLAS FOR SOCIAL - STUDIES (1979)

(d) To determine the implication of ginger production on other crops.

1.3 HYPOTHESIS

The following is the working hypothesis of the study:

ginger production has made no difference in the income and crop mix of the people of the study area.

1.4 SIGNIFICANCE OF THE STUDY

What motivated this study have to do with professional concern, findings of past experiences, recommendations from former researches conducted, and the need to create something new. The study is undertaken to provide data and analytical guidelines for understanding and improving the efficiency of ginger production and productivity in Southern parts of Kaduna State as they relate to production process, prices and income of the people.

Data on the production and prices of ginger over the years have been given little consideration except as an indicator of the general price level of the economy. This study would therefore be of some importance to agricultural production and resource allocation as well as to policy makers. Moreover, there is a paucity of data on ginger prices and their effect on farmers' income. People more or less speculate about factors influencing ginger production - prices, marketing channels, and their effects on the producers' welfare. There is hardly any consideration given to the inter-relationships of prices, production costs, and the welfare of the producers. Research work on these aspects would therefore help in understanding some of the problems of ginger production in particular and agricultural commodities in general, and help policy makers and researchers to work out ways of improving the income of the farmers.

Moreover, the process of ginger production, as already stated, requires high labour input. From the tilling of the land, leaves or grass cutting, planting, manuring, mulching, weeding, harvesting, transportations, to processing of the crop for marketing either through peeling and washing or through slicing, demands intensive labour and costs a lot. The crop, apart from requiring high fertilizer or manure input, demands great and constant attention. Generally speaking, it costs alot to cultivate ginger. And upon all this, its yield per hectare in the study area as compared to other producing parts of the world, is very low (James, 1987; Musa, 1990; Turu, 1987), and its storage very delicate. Coupled with its poor market prices at farmers' level, the study of ginger would therefore serve as a good reference point for highlighting the problems facing agricultural production in the country. It would also serve as a guide for finding relevant solutions to the problems.

1.5 THE SPATIAL FOCUS OF THE STUDY

This study focuses on Jaba and Kachia Local Government Areas of Kaduna State for the investigation of ginger production and its effects on producer prices which consequently affect farm income. The State has been chosen for study for a number of reasons. First, the economy of Kaduna State is primarily agricultural, although it has a significant and growing urban sector. Its agricultural sector is characterised by small holders who produce for subsistence, the domestic market, and for export. This therefore ties the welfare of the rural people to agricultural development.

Secondly, Kaduna State in general, and Southern parts of it in particular, has a long indigenous history of ginger production and lays claim to being the locale of the oldest species of ginger in the world (Turu, 1987; Momber, 1942).

The third reason is that the study area is the most dominant producer of ginger in Nigeria, and has placed the country as one of the first four producers of the crop in the world. Yet, the industry is not receiving meaningful attention by the government. Mallam (1991) observed that the government has ceased taking the responsibility of marketing ginger for the past seven years, and consequently the industry has been neglected.

A very large percentage of the population of the area grow the crop. While Ibrahim (1985) gave the percentage of ginger producers as 65%, Mallam (1991) put it at 90% of the total population.

For practical reasons, however, it was necessary to limit the study to the dominant producing area of the State. That is Jaba Local Government Area and producing areas of Kachia Local Government Area of Kaduna State. Data were collected from the producing villages and main market centers for good coverage and fair representation.

1.6 METHODOLOGY

This study makes use of two major sources, primary and secondary data.

1.6.1 Primary Data:

Primary data were obtained through questionnaire surveys conducted among the producers, local middlemen, rural assemblers, and urban wholesalers. In all, three sets of questionnaires were administered by trained assistants under the supervision of the researcher. The first set was administered to local producers of ginger, the second to rural assemblers and middlemen, while the third set was administered to officials of urban-based businessmen who played the function of wholesalers who buy and load the crop in lorries for sale at the sea ports or in various urban industries.

A structured interview was also conducted with the Manager in-charge of Technical Operations in Kachia Ginger Processing Industry.

The local ginger producers interviewed were selected from twenty-eight main producing villages in the two Local Government Areas. These villages were Kwoi, Chori, Nok, Daddu, Gora, Ramindof, Fai, Dura, Samban, Kyari, Bitaro, Kurmin Jatau, and Angwa Tunga in Jaba Local Government Area, and Kachia, Kuda, Jaban-Kogo, Kwaturu, Kurmin-Mata, Maidamishi, Dandan, Walijo, Bahago, Gyani, Sabon Sarki, Bursan, Kurmin-Musa, Kurmin-Rami, Antong and Kubacha in Kachia Local Government Area. In each of these settlements, 7 to 8 producers were randomly sampled and interviewed making a total of two hundred and ten (210).

The second set of questionnaire covered all the major marketing centres - namely; Kwoi, Tsakiya (Daddu), Chori and Nok in Jaba Local Government Area, and Walijo, Kubacha, Kuda, Kachia and Kurmin-Musa in Kachia Local Government Area. In each of the markets, 5 to 9 rural middlemen (depending on the size of the market) were randomly sampled and interviewed. In all, 68 rural middlemen were interviewed. Moreover, between 2 and 5 rural assemblers were interviewed in each of the rural markets. There was a total of 30 rural assemblers interviewed.

The third set of questionnaires was administered to officials of urban-based businessmen who were wholesalers of ginger located in Kaduna and other parts of Nigeria. The researcher was able to interview only 7 of these wholesalers. Two of the wholesalers were based in Kaduna, one in Kafanchan, two in Kano but with branches in Kaduna, one in Port-Harcourt but with a branch in Kafanchan and one in Lagos with a branch in Kachia. A total of 7 questionnaires were delivered.

In all, a total of 315 questionnaires were administered during primary survey.

1.6.2 Secondary Data:

Secondary data was obtained from books, journals, conference and seminar papers, articles and dissertations. Official documents from Ministries and Local Government offices were also used.

Direct observations and measurements of the farmland sizes of ginger were carried out as well as observations on methods of ploughing, harrowing, manuring, mulching, weeding, harvesting, processing for sale, and selling methods and measures.

1.6.3 Methods of Data Analysis:

Descriptive as well as inferential statistical methods were used to summarise the data collected as well as to determine the associations and relationship among the important variables of the study.

1.7 SCOPE AND LIMITATION

An evaluation of production and marketing of any agricultural commodity should ideally include the costing of every quantified item or aspect of input and output as well as wide spread coverage of its marketing system, and analysis of changes over time in both production patterns and marketing of the crop.

However, the collection of data for this study required a compromise between widespread coverage of the area and detail in data collected. The study choose to make a widespread coverage of the area without much detaile data being collected from each of the villages due to time available for the study. For instance, 28 of the 37 villages within the study area were covered. Between 7 and 9 questionnaires were delivered to ginger farmers in each of the producing villages covered.

An important limitation of the data collected is that the accuracy of the data depended on the experiences of the trained assistants. In the absence of any standard distance and weight measures being used in the farms and markets, measurements and prices did varied due to the difference in the local units used for measuring farm plots, costs of inputs and outputs, and for market prices of the commodity. Again, the averaging of the figures from different villages and rural markets is a major source of bias as no system of weighing was done.

The survey also relied on the ability of the farmers and intermediaries interviewed to recall past years' ginger production and prices at various times of the years, and these were not always accurate. This can be ignored because it gives a rough idea of what the production and prices were at that time or year.

One other limitation is the inability of the researcher to cost all the other crops grown together with ginger, since they contribute to the income realised in each hectare of land used for ginger production.

In addition, the use of farm gate prices of ginger as a source of farm income and thus people's welfare is a limitation, considering the fact that there were other sources of farm income for ginger producers. Apart from the farming, there were some other sources of income, like trading, tailoring, weaving, etc.

However, these limitations should not reduce the usefulness of such studies, which dealt with overall production costs and price trends, and their behaviour between locations and time periods especially as it affects the income of the producers and their general welfare.

CHAPTER II

LITERATURE REVIEW

2.1 CONDITION OF NIGERIAN AGRICULTURE

In recent years there is a growing realization in Nigeria that agriculture must be exploited fully before the limited petroleum resources dry up (Mustafa, 1980). The crucial role of agriculture in the development of Nigeria cannot be doubted. For, "agriculture continues to be the mainstay of the Nigerian economy. It provides the bulk of the employment, income, and food for the population. It is the source of the raw materials required for the country's agro-based industries. It is also an important foreign exchange earner, a potential which is increasingly being exploited" (Fourth National Development Plan, 1981 - 1985, pp.24).

In 1960, agriculture accounted for about 70% of Nigerian Gross Domestic Product (GDP). Surprisingly, this dropped to 55% in 1966 and about 24% in 1970 (Oyemelukwe and Filani, 1983). According to figures from the Fourth National Development Plan (1981 - 1985), the role of agriculture in Nigerian Gross Domestic Product further dropped to 18% in 1973, 11.8% in 1977, 10.3% in 1980 and 8.2% in 1985. Not until recently, the oil boom seems to have had a devastating effect on our agriculture. Even after th discovery that agriculture must be fully exploited, its growth has been painfully slow (Mustafa, 1980).

Despite these odds in agricultural growth rate, the rural sector has made some useful contribution to the capital formation and general economic growth of Nigeria. But, since this could not withstand the fast growing population of about 2%, Nigeria that used to be self-sufficient in food production and an exporter of numerous cash crops, started importing food commodities (Ntamere, 1980).

It is the discovery of the alarmingly very high bills of food import which drove home the need to fully exploit our agriculture. Efforts in this direction include the introduction of programmes like Operation Feed the Nation (OFN), Green Revolution, Graduate and School Leavers Agricultural Schemes, and the introduction and expansion of many agricultural research institutes in Nigeria.

Unlike in developed countries such as U.S.A., France and Canada with 4%, 12% and 8% respectively of their population participating in agricultural production, Nigeria still has over 70% of its population engaged in agriculture. This being the case, the integration of rural areas into mainstream national development is inevitable a pre-requisite as a foundation for any meaningful development (Ntamere, 1980). It also means that traditional agriculture must be transformed in order to get Nigeria out of its present economic problems. According to Baba (1981), our good opportunity in putting our economic problems behind us lies in this right strategy; careful incorporation of the country's huge rural population into a more productive agricultural sector. Establishment of proper linkages between agricultural and industrial sectors of the nation can enhance faster development.

2.2 AGRICULTURE AND RURAL ECONOMY

There has recently emerged in development literature a good concern on rural poverty. Day after day, more and more research works try to develop new strategies that will not only raise rural incomes but results in the overall and simultaneous development of the rural economy.

The term 'income' is used in this work to refer to surplus value from any investment for the satisfaction of one's needs, that is, not just getting ones' investment back but getting extra in material form for solving one's problems and for further expansion of investment (Ariyo, 1991; Doddomi, 1981). In broad terms therefore, income is highly dependent on the fields of the people's investment, and is used in this work to describe the state of the rural economy.

A foundamental economic theory is that which stipulates that the attempt to maximise income is the motivating force behind man's action. This means that the most important thing to the farmer is the way which a particular land use contributes to his income and the price he receives from the product associated with the land use (Found, 1971). The income of rural dwellers in Nigeria tends to come mostly from investment in agriculture, although some of them engage in other economic activities that help to raise their incomes (Doddomi, 1981). Just like farmers in other parts of the world, the Nigerian farmers (mostly small scale) generally operate within this basic premise of agricultural economics.

As earlier stated, the agricultural situation in Nigeria shows that the rural farmers constitute the basic elements. They provide food for the fast growing population and raw materials for several of the industries. According to Mustapha (1980), they are very much "in a vulnerable position in comparison with other professional groups". Of all Nigerian occupational groups, rural farmers are at the bottom. Rural Economic Survey report of the Federal Officice of Statistics, Lagos (1975) has this to say about income of farmers in comparison to other professional, management and technical groups in urban areas:

> The income ratio between those two groups in urban area were 1: 23 in 1963 and 1: 27 in 1970. The comparable figures for rural areas were 1: 10 in 1963 and 1: 11 in 1970. Comparing rural farmers with the highest income group of urban area, the income ratios were 1: 36 in 1963 and 1: 42 in 1970.

These statistics indicate how the income differential between the rich urban people and the poor rural farmers has been increasing in Nigeria over time. The farmers who are the largest group of 70% in Nigeria (Mustapha, 1980) earn the least income. Their income situation must be taken into due consideration, not only because farmers supply food for us and raw materials for industries but also for humane consideration of income difference. Moreover, the improvement of rural income will generate additional effective demand for other goods and services which in turn will stimulate general economic growth and development.

Improvement in rural income will play a crucial role in the rural development process. The rural farmer will improve in his productive capacity. Such improvement is likely to come about as a result of one or a combination of the following:

(a) increase in output per hectare;

(b) increase in output per unit of labour; and

(c) through an expansion in cultivable area

(Ntamere, 1980). Where rural income improves, there could also be a shift in production function due to changes in technological usage. For instance the farmer would be able to afford responsive input like high yielding fertilizer, improved cultivation practices, or better control of plant and seed diseases.

Labour absorption by the non - agricultural sector is low in Nigeria (Dovring, 1978). For a long time to come therefore, agriculture will remain the main source of employment in the country. So, farm income should be made attractive to attract and maintain the large population that live and work in rural areas. Dovring (1978) further observed that where the absolute number in agriculture remains stable, non-agricultural employment will have to increase by 10% a year for 40 years declining to

5% after that period to bring the ratio of agricultural and non-agricultural population in Nigeria to 50 : 50. This implies that with our present population growth rate of over 2% a year, a greater part of Nigerians will continue to live and work in rural areas and/or depending on agriculture for income for many years to come.

In view of all these therefore, Nigeria should evolve a pattern of rural development that maximizes rural employment and raises the real incomes of rural residents. Maximum use of available land, raw materials and labour to meet the local demand should not be frustrated by government policies, non-governmental parastatals or individuals, but be upheld by all.

Today, every occupational group in Nigeria is, in some form or other, pressing for higher earning. Farmers are silent all through. They do not have strong organisation to press for their demands. That is why, as pointed out by Odigboh (1976), an average farmer in Nigeria produces an equivalent of 3.87 metric tons of cassava per year from his one hectare of land, which then gives him an annual income of not more than ₦200.00, yet, no one sees him on the street performing peaceful or violent demonstration. Where his powers are not limited by income and governmental authority, he can handle more than one hectare of land a year. Instead of pressing for increase of income, Mustapha (1980) observed that over 50% of Nigerian farmers engage in other side business, with the remaining 50% who do not engage in other side business, being the elderly who cannot do so.

2.2.1 Agricultural Income in Relation to Free Market:

Where all the obstacles of production are removed and the Nigerian farmer happens to make good yields, he is again faced with a delimma. Baba (1981) asserts that in developing nations, Nigeria in particular, as soon as the production goes up price comes down, usually at a higher rate. This brings the total revenue down further and making the farmers poorer instead of giving them a chance to an income comparable to other occupational groups.

Farmers' welfare also depends on the relationships between:

(a) Prices they receive for their produce

(b) Prices they pay for inputs and

(c) Prices they pay as consumers of other commodities.

With the price farmers receive, they are expected to cover:

(a) the cost of maintenance of their farmland, equipment and other properties, and on money borrowed for purchase and improvement.

(b) Services and supplies (seeds, fertilizer, fuel, labour, etc.).

(c) consumers' goods and personal services for themselves and their families.

In marketing, sales depend on both the amount sold and the price. But for agricultural product, there is a negative correlation between these two (Mustapha, 1980). That is, the more agricultural commodities in the market the lower the price. Mustapha (1980) further observed that price flexibility of several crops in Nigeria is more than one. This makes one percent expansion in crop production to attract more than one percent reduction in price, bringing down the total revenue. Thus, the farmers are likely to have less income each year they produce a commodity in large quantities.

Although researchers and development planners have become increasingly concerned with the income of the farmers, Matlon (1977) pointed out how insufficient data have, among other things, restricted effective policy action. Yet, governments in developing countries and especially in

Nigeria, have had to set up machinery to implement pre-announced support price policies. For instance, in 1977, the Federal Government of Nigeria reformed Marketing Boards with a view to increasing producer income and the levels of input in order to guarantee adequate returns to the farmers. According to Olukosi (1986), there are available evidences in producer prices to suggest that these objectives have not been achieved. Nigerian Federal Government confirmed this failure when it proscribed the Marketing Boards few years ago.

There is a general agreement which stipulates that efficient structuring and organisation of market prices serve as an important means for raising the income levels of the rural farmers and for promoting a country's economic development (Abott, et al, 1972; Baba, 1981). The main concern here is the reduction of uncertainty as to the price they will receive and the overall increase in their income. Moreover, the structure, organisation and operation of the market is the generator of commodity prices which in turn perform the functions of revenue allocation, inter-sectoral income distribution and capital formation (Mellor, 1968). These three functions of prices will therefore be insufficiently performed unless there are forces conducive enough to generate them. It is when there is a good market price that the farmers' income improves, thus enabling them to increase their purchase of personal consumption goods and farm supplies and to finance added farm input. It is through these steps that growth in the economy is likely to take place leading to overall development.

2.2.2 Agricultural Income in Relation to Factors of Production:

An understanding of the nature of effectiveness of the factors of production particularly as they affect yields and consequently income of the producer, is also essential. This is because where other factors (e.g.

prices) are in good order but productivity per input is low, surplus value on the investment is not likely to be reached.

Agricultural practices in the study area are pre-dominantly traditional, carried out by small scale farmers. According to Ukpabio (1978), traditional farming methods and land tenure system in Nigeria, in some ways or others, tend to inhibit good returns of investment on land. For instance, the tools used are local and hardly cultivate large pieces of land by individuals and in good time. The seeds used do not give good yields, while some of the farmers do not readily adopt new ideas to make them get good returns. Traditional land tenure system on its own part inhibit extensive use of land for farming, where the farmer is willing to use improved technology.

This therefore implies that using unimproved methods of farming, the small scale farmer is likely to cultivate a fairly large piece of land and ends up not getting yields that justify his total inputs. So, where other factors are held constant, a particular crop, unless it is a high yielding one, may not sustain reasonable returns. And, where all factors of production, in addition to those of prices and marketing system, do not significantly uphold cultivation of the crop and agricultural production in general, then the effects on the income of the farmer will be adverse. A review of past works on ginger production presented below will help us to understand these relationships better.

2.3 PREVIOUS STUDIES OF GINGER PRODUCTION

Ginger (*Zingiber Officinale roscoe*) is essentially produced in the Southern part of Kaduna State as a cash crop. The works of Musa (1989), Kari-Kari and Musa (1985), Bagy (1991), and Duka, Shanono and Rathnam (1985) show that ginger is the main cash crop of the study area. But it is not the only crop. It is grown along side other crops. The predominant pattern of crop production is food crops like guinea corn, maize, millet, acha, yams and cocoyams combined with either ginger, groundnut or rice (Bagy, 1991). No matter what agricultural commodities they produce, almost all the farmers produce food. Most of the farmers do not produce food commercially, but grow only enough for their own needs. When an excess of food crops occur and is sold, it is not a major source of income (Musa, 1990; James, 1986; Turu, 1986).

Although the works of Momber (1942) points out that the crop (ginger) must have originated from the area of study, Kari-Kari and Musa (1985), Musa (1989), James (1987) and Turu (1986) observed that production of the crop in large quantity in the study area started essentially due to the influence of colonial administrators who then were looking for a crop that will improve the income of the people and make them pay tax with some ease, as well as provide spices for industries in Europe. At that time spices were in high demand in Europe for food processing and medicinal purpose.

Since then, ginger production has been on a rapid increase in the study area. In 1927, over 100 tons of fresh ginger was recorded. In 1945 shipment of 5 tons of dried ginger to Europe was carried out. The works of Musa (1989), Turu (1986), James (1987) and Duka, Shanono and Rathnam (1985) reveal how production has been growing between 5% and 10% per year, placing Nigeria as one of the four largest producers in the world. Rapid increase in production led to the establishment of a ginger processing industry in Kachia in 1986 and the birth of a news magazine in 1987 with a name "The Ginger" - Kachia Local Government quarterly news magazine.

However, research works done by Duka, Shanono and Rathnam (1985), Okwuowulu, et al (1982), Agricultural Extension, Research and Liaison Services Report (1987), and Evenson et al (1987) stipulated that ginger is a very delicate crop to grow. For instance, ginger requires abundant rainfall of about 1,000mm distributed over 6 - 8 months during the growing season. The rain requirement should not be less than 900mm. The studies also revealed that the best temperature requirement during growth should be between 25° and 30°C. Temperatures exceeding 32°C results into sun burning of the newly emerged shoot. Moreover, any slight trace of water-logging in the soil leads to decay of the rhizome. These factors necessitate the careful selection of gentle slopping fertile sites for the crop and the trouble of cutting leaves or grasses to properly mulch the bed after planting.

The process of ginger production from site preparation, tilling of land, breaking of the dug bed into small pieces (harrowing), planting, mulching, weeding (which is done through picking of grasses by hand), manuring, digging of the produce, transporting it home (mostly done by portage), scrapping or splitting the rhizomes, washing and drying them, and packing and transporting the commodity to the market, involve very high labour input.

Musa (1989), and James (1987) were with the opinion that the farmers sell their produce at a loss if all the costs of production are to be considered. This could be seen in the emphasis of James (1987), and Bagy (1991) that prices are rediculously low. In the words of Musa (1989), he said: "From the above, it may be concluded that if every ginger production is to be costed, ginger will be one of the most expensive crop to produce and consequently, the producer prices presently being offered for split ginger (₦150 per 50kg sack) will be a mockery to the farmer".

James (1987) blamed the governments for not giving enough attention to reviving ginger production, trade and industries. In the same manner, Kaduna State Ministry of Agriculture Report (1987) observed how "even the recent attempt at reviving the production of cash crops in the country through price incentives did not consider ginger at all".

But the problem did not end there. Nigeria is ranked as one of the world's top four countries in ginger production. Studies by Tarah (1986) discovered that in terms of productivity per hectare, Nigeria is still far behind the others. Nigerian ginger is of high quality but our methods of production are about 40 times less effective compared to those of India, China and Jamaica. Musa (1989) similarly discovered that seeds that can be used to plant one hectare of ginger farmland weigh between 1,000 and 1,600kg. From this, Nigerian yields range from 5 to 15 tonnes per hectare, while Jamaica and India's yields per hectare is about 40 tonnes. This probably explains why after taking 175 man days trying to produce one hectare of ginger, and taking 400 man days to peel, say 10 tonnes per hectare yields (Musa, 1989), an individual's income from ginger is very low, where all his inputs are costed.

From these studies therefore, we can see how several factors work to decide the scope of income generation from ginger production. Further chapters will highlight the degree of the matter. The farmers continue in their bid to produce more and more ginger each year under severe constraints. It is essential that these constraints be removed for the rapid development of the producing areas.

CHAPTER III

THE STUDY AREA

3.1 INTRODUCTION

The two Local Government Areas under study are 2 of the 18 Local Government Areas of Kaduna State. As everywhere, the contemporary system of agricultural production and marketing in Jaba and Kachia Local Government Areas are largely the product of the area's physical, demographic and socio-cultural environment. In order to explain agricultural production and marketing systems, there is need to have an understanding of the environment. This chapter tries to present a brief discussion on the location, relief and drainage, soil, vegetation, transportation network and socio-economic characteristics of the study area.

3.2 LOCATION AND SIZE

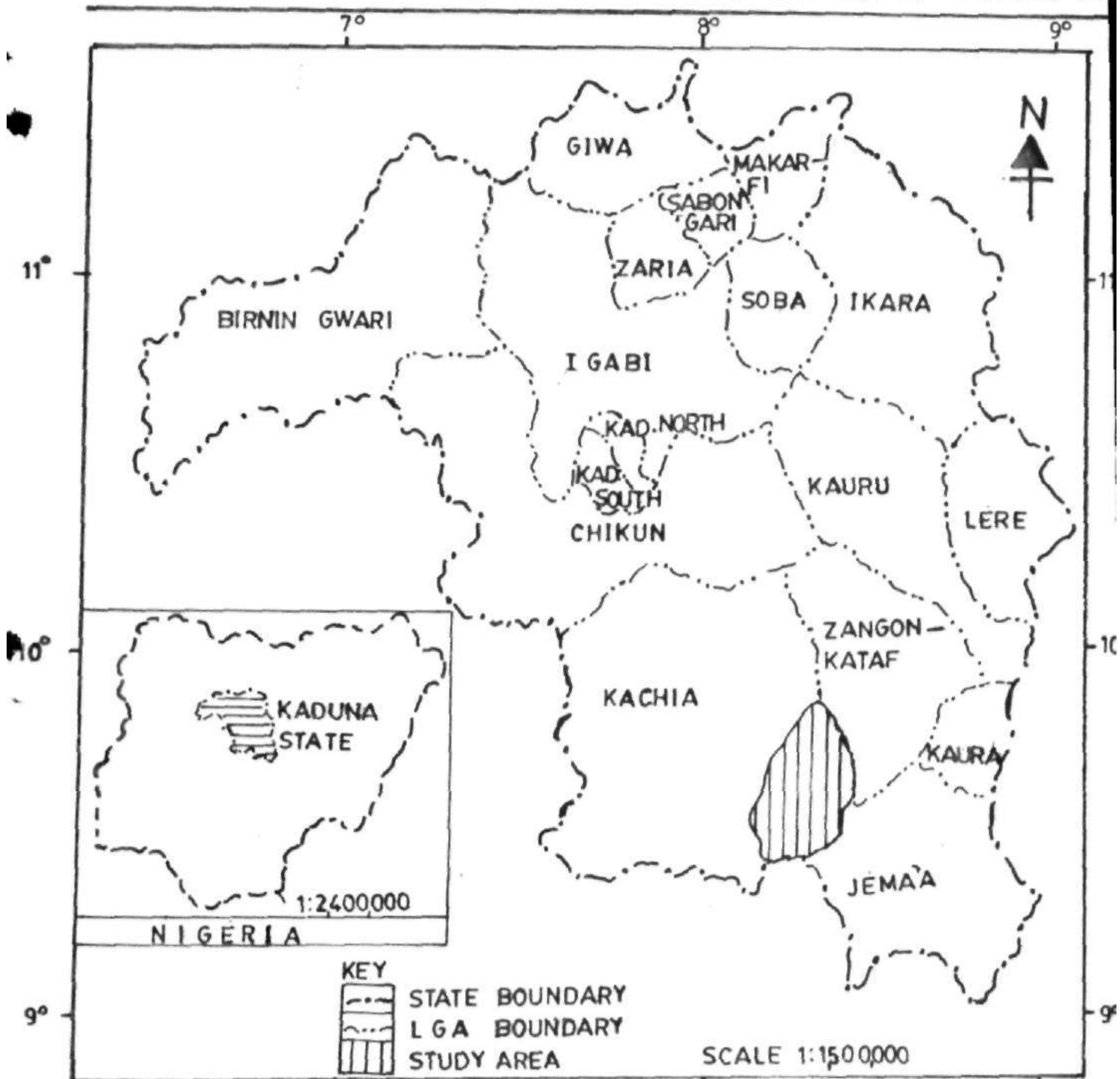
Jaba and Kachia area is located on the North Central Plateau at a height of about 732m above sea level. In more precise terms, the area lies between Latitudes 9^{o} 15N and 9^{o} 55'N, and Longitudes 7^{o} 50'E and 8^{o} 10'E. It is bounded on West by Kagarko District, on the North by Chikun Local Government, on the East by Zangon Kataf Local Government and in the South by Jema'a Local Government Area. At its extremes, it measures about 40km East to West and 75km North to South (Buchaman, 1955).

3.3 THE PHYSICAL SETTING

3.3.1 <u>Geology, Relief and Drainage:</u>

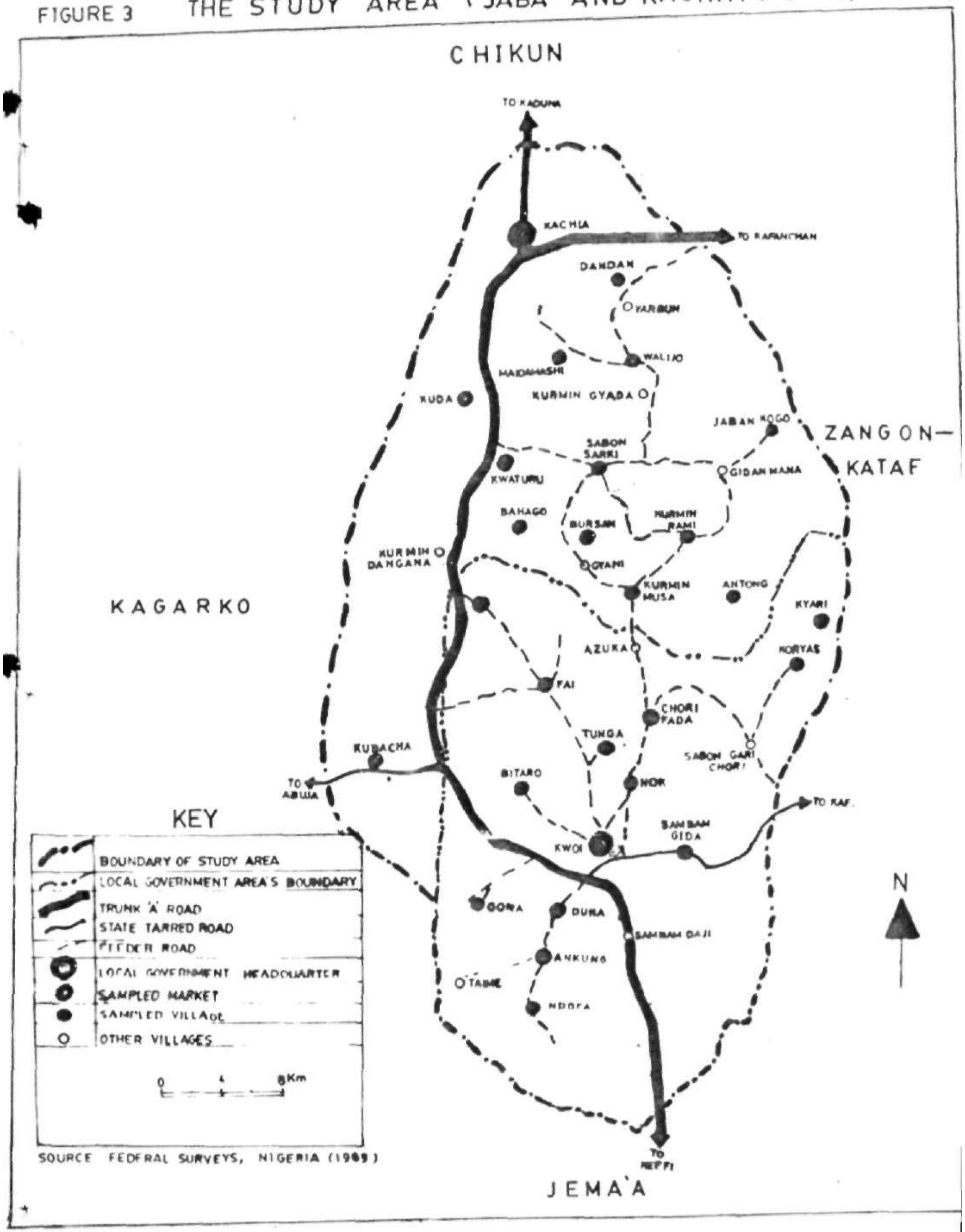
The study area is underlain by undifferentiated Pre-cambrian rocks of the Basement Complex rocks (Buchanan, 1955). The basement complex rocks

.2 KADUNA STATE: LOCAL GOVERNMENT AREAS



SOURCE FEDERAL LANDS AND SURVEY, KADUNA (1992).

FIGURE 3 THE STUDY AREA (JABA AND KACHIA L G AREAS)



(igneous and metamorphic) are predominantly granitic, although gneisses, migmatites, schist and quartzites are also present. In general, the area has almost extensive level of gently undulating lightly dissected land broken in few places by rock out-crops and hill features (inselbergs) which vary in size and dimension.

The general relief of the area lies between 700 and 800m with few out-crops rising 100 to 600m above the surrounding land. Good examples are the Chori hills, the Samban, Nok, Kwoi, Duya and Jaban-Kogo hills (Theyra, 1978).

The uplands of the area gently slope into low lying streams and marshes called 'fadama' in Hausa. The area is well drained by streams flowing from various directions into the River Gurara which runs from North-West towards the Southern part of the area emptying directly into the River Niger. There are only seasonal streams in the area. Most of the streams are flooded during high peaks of rainfall thereby destroying nearby farmlands and some bridges which make accessibility to and fro farmlands and market places very difficult during that period.

3.3.2 Climatic Conditions:

There is a marked dry and wet seasons in the area. The dry season is between November and March, but there are times that sporadic showers punctuate the season. During this season the area experiences cool dry north-easterly winds which yield virtually no rain. Vegetative growth over these months decreases to a minimum and cultivation ceases except through irrigation at some river banks. The season changes from April. The moist South-Westerly brings rain, and both cultivation and vegetative growth respond almost immediately. Hence, the vegatation is characterised by deciduous trees and annual grasses.

High mean annual rainfall is experienced in the area which, according to Kowal and Knabe (1972) is 1,525mm or more, and the length of the rainy season is 200 days or more. The highest rainfall in the area is recorded between the months of August and September.

The highest temperature occur in March and April just before the rainy season begins. The mean monthly temperature reaches 28°C in March and drops to 23.3°C in December. The low humidities which the strong harmattan wind brings intensify the effect of the low temperature. This wind which is felt between November and February plays some significant role in drying grain in the farms - making them ready for harvest.

3.3.3 Soils:

The interaction of the climate with plant and animal organisms and the geological parent materials, and influenced by the relief and length of time of active activities, leads to the formation of soils in the area.

In general terms, the area is made up of tropical soils which are derived mainly from the Basement Complex rocks. These soils develop on well drained sites. Hydromorphic (fadama) and alluvial (flood plains) soils are also common here. The fadamas which are fairly rich in nutrients and have good to excessive water supply that persists in the dry season, are of special importance to the people. Many parts of it are used for the cultivation of high moisture demanding crops like padi rice, cocoyams, cassava, sugar cane, and vegetables.

The other type of this ferruginous tropical soil is the upland soils developed on well drained gently sloping lands. The upland soils are generally considered to be of low fertility as compared to lowland (fadama) soils developed from either alluvial or deep aeolian drift soils.

3.3.4 Vegetation:

The vegetation of the area is characterised by scrub savanna interspersed with orchard bush, which is a representation of a degration of the natural vegetation. Areas of heavy cultivation degrades to park-land. Patches of wood land are found towards the valley bottoms with some oil palm trees growing along the stream banks. In this area, the vegetation is generally largely secondary in nature due to cultivation, burning, grazing, fire - wood gathering, and cutting for building purposes which all contribute towards destroying the natural vegetation, thus, modifying it. Although there are some spots of intensive cultivation, the area is generally not intensively cultivated and there are traces of shrub regrowth. Trees like silk cotton, mahogany, locust beans, iroko, etc. are found scattered among fairly tall shrubs.

3.4 POPULATION

Population is one of the foremost variables in any study that has some thing to do with income in relation to agricultural production. The size, growth, density, distribution, and other occupations of the people, in addition to its culture are some determinants of the level of income.

Based on the past population census of 1991, the population of the study area is about 283,645 persons. This is projected at a growth rate of 2%.

The area is experiencing a gradual population increase, and is certainly continuing if not accelerating. The high population growth rate is a recent issue. Almost certainly, during the latter part of the nine - teenth century and early part of the twentieth century, the population of the area declined due to high death rate as a result of wars and epidemics. The early part of the twentieth century (not until recently) witnessed mass movement of people from this area to urban areas in search of white colar jobs. These factors led to slow growth rate of the population in the area.

Recent improvement in the basic level of health and other living standards is, however, aiding population growth rate in the area. This means that further improvement of these factors will lead to higher growth rate of the population.

There is a considerable variation in population density between the various parts of the area. There is considerable high density of population in Kachia, Kwoi and big villages such as district headquarters and market centres. Low density areas on the other hand, could be found around smaller villages and harmlets. Most of the people in the study area reside in typical rural areas.

3.5 SETTLEMENT PATTERN

To understand agricultural production and its effect on the income of the rural people, one has to study and have a good knowledge of the location and patterns of the rural settlement. All the people living in the study area can be classified as rural - even those in Kwoi and most parts of Kachia town. Therefore, three major patterns of settlement can be distinguished in the study area.

The bigger agricultural villages of various sizes called 'Kauyuka' in Hausa, form the first category of settlement. These villages are mostly located in the centre and serve as nuclear of the other rural communities. Such villages often have facilities to render various kinds of services, provisions and marketing, and tend to be connected with the outside world. Local craftsmen who process the raw materials and provide goods and services to the local population live in these villages. Also, village area Chiefs live here. Most of the villages have long history of missionary activities. Example of such villages are: Kachia, Kwoi, Sabon Sarki, Walijo, Chori, Daddu, Kubacha, Kudah, Kurmin-Musa, etc.

Around these nuclear villages are located smaller units of settlement called 'Ungwa' which form the second category of village settlement. These satelite settlements of varying sizes tend to be scattered at varying distances from the larger settlements. Since they are not usually self-sufficient, they rely on the larger settlements (villages) for various goods and services. They have a population that is usually composed of an extended family groups that traces their origin to the nuclear villages. That, is they moved out of the nuclear villages to settle near their farm lands. Examples of such unit settlements are: Ungwa-Fari, Azuka, Ungwa-Rana, Ungwa-Dodo, Ungwa-Zomo, etc.

The third form of settlement consists of one or more nuclear families scattered between the harmlets or in the bush. Some scattered rural families move out of the villages or harmlets to live in or near their farm lands.

3.6 SOCIO-ECONOMIC CHARACTERISTICS

Farmers who undertake the bulk of agricultural production make up the bulk of the population in the study area. Thus, for us to examine their income in relation to agricultural production, it is necessary to have an insight into their social and economic setting.

3.6.1 Social Structure:

The mainstream of socio-cultural life and tradition in Jaba and Kachia Local Government Areas originated from within the area (Doddomi, 1981). There is a high degree of cultural and religious uniformity in the area.

Before the penetration of Christianity into the area, most social organisations were based on African Traditional Religion. Although this traditional religion is still practiced by few, the people are predominantly Christians, and the Christian faith has been a unifying force between the rulers and the ruled. There are very few Moslems in the area. The main ethnic groups in the study are are the Ham (Jaba) and Koro. Other migrant tribes who form a minority group include the Hausa, Ibo, Yoruba and other ethnic groups of Southern Zaria. The Fulani, on the other hand, only temporarily settle in the area due to their annual migratory habit.

The people of this area both practice monogamy and polygamy - even among the Christians. They both hold common judicial administrative institution. Languages spoken are Jaba and Koro, though they both speak Hausa. Today Christianity and African Traditional Religion have resulted in an underlying uniformity in the social structure of the area, and appears to form the basis of its social values.

The Jaba people form the greater bulk of ginger growers. They cover the whole of Jaba Local Government Area, Jaba District of Kachia Local Government Area and some villages around them. Some of them live in Kachia town and other villages in Kachia and Kagarko Districts. The Koro live in the Southern part of Kachia Local Government Area. They are a minority group among the ginger producers compared to the Jaba. Howeveer, both ethnic groups have similar culture and the same religion. Language diversity is very little, thus, the similarity in social activities.

3.6.2 Economic Structure:

Small-scale farmers, most of whose labour force, management, and capital originate from the household, are the ones that undertake the bulk of agricultural production in the area. The economic importance of small-scale farmers in the area can therefore not be over-emphasized. But they constitute the poorest segment of the society (Abulu et al, 1979). They are not organised and therefore lack political and economic power. This has resulted into the fact that they are poorly served, slow to change, and thus, still use technologies that have been used by their ancestors for many generations without giving them much improvement. That the small scale farmers in the area have not been able to produce assured surplus is therefore, not surprising.

The major crops grown in the area include sorghum, millet, maize, yam, cocoyam, rice, groundnut, acha, beans and cassava. Minor crops include soya-beans, sweet potatoes, bambara nuts, benni seed, irish potato, sugar cane and pepper. Market gardening is also practiced in the dry season for the production of vegetables such as cabbages, spinach, karkashi, lettuce, tomatoes, pepper, okra and other green leaves. Fruits include olive, mango, locus beans, palm fruits, oranges, cashew, guava, paw-paw, pineapple, grapes, to mention but a few.

Ginger is the major cash crop in the area. It is an important income earner to the farmers as well as a foreign exchange earner to the country. Presently, four Local Government Areas (Jaba, Kachia, Zangon-Kataf, and Jema'a) in Nigeria produce ginger in commercial quantities. Jaba and Kachia Local Government Areas, however, are the dominant producers (Musa, 1989).

Livestock is also important in the economy of the area. The people, in addition to farming, engage in livestock raising such as pigs, goats, sheep, rabbits and poultry.

Although agriculture forms the mainstay of the area's rural economies, there are, in addition, various secondary occupations into which rural labour may be absorbed either conjuctively with farm operations or during the slack periods of farm labour demand. Such occupations serve as alternative means of rural employment, and supplement source of cash income generation. The secondary activities take the form of various services such as tailoring, hire-labouring, butchering and petty trading which are oriented more towards the larger villages. Local crafts such as weaving, carpentry, blacksmithing, carving, pottery, etc. are oriented more towards the dispersed settlements. Others include hunting, building and fishing.

3.6.3 Land Tenure:

The cultivated land in the area is acquired through four main sources: inheritance, purchase, pledge (jingina) and gift. Other less important ones are allocation and loan (rance / aro). In the area, farmlands are generally held under permanent usufructuary rights, chiefly through acquisition by inheritance and pledge. This is probably due to the fact that farmers prefer tenure arrangements that ensure maximum security. There is relative exclusion of land gifts (kyauta), reallocation by village heads and purchase, as they can lead to permanent lose of right on land. Instead, inheritance (gado) and pledge (jingina) remain the only two main media by which permanent ownership right over land can be gained.

Migrants to the area normally borrow land from either individuals or the village head or both. In general, uncultivated lands are under the control of the village head so that he can lend some portions to anybody in need, but dares not sell it out.

The issue of lending, hiring or pledging out land has generated a lot of conflict in the area these days owing to the fact that some of the farmers who borrow, hire or are pledged land, sometimes lay claim over it, usually after the death of the owner. This issue of land dispute, like in other parts of the country, causes a lot of concern these days.

3.6.4 Size Distribution and Holdings:

In all agricultural economies, agricultural production in particular, the issue of land distribution is one of the most important factors. The works of Theyra (1985) reveals that the different land per resident ratio in most villages has an influence on the size of farm land or holding. Thus, as the population decreases from larger settlements to smaller ones, the average size of farm holding increases.

Studies by Keddie (1969) show that in traditional agriculture, there is often a direct relationship between land distribution patterns on the one hand, and political, social and economic stratification on the other. Generally, farmers in the study area can be grouped into the following categories: small farmers (those operating on land between one and five hectares) scattered in small patches at various parts of their village or in one place; medium farmers - those with five to eight hectares; and large farmers - those with nine or more hectares of land. Most of the farmers belong to the first category except in few cases where people that have strong political influence and high social status have larger farmlands than ordinary peasants (Olayide, et al, 1981).

CHAPTER IV

GINGER PRODUCTION AND ITS TRADE IN THE STUDY AREA

4.1 INTRODUCTION

This chapter focuses on both the description of what ginger is, its economic value to man, how it came up to be produced in the study area, as well as the description of findings on the production practices and processing of the crop for sale. Moreover, factors that are necessary for ginger production are also considered.

4.2 GINGER: ITS NAMES AND VALUE TO MAN

4.2.1 Names of Ginger:

Ginger (Zingiber Officinale roscoe) is a well known crop under a variety of names in different parts of the world. As one of the spice crops known to our modern world, it belongs to the family of Zingi. In Jamaica, for instance, it is called "Tamil" and the dried rhizome as "south". The French call it "Gingembre", and the Germans "Ingwer". The Malayans call it "Haliya" while the Japanese describe it as "shoga". All English speaking countries of the world call it "Ginger". In Nigeria, it has a great variety of local names. For example, ginger is called "Chitta mai yatsu" in Hausa, "Ata'le" in Yoruba and "Ose-Oji" in Igbo (Karikari and Musa, 1985). In the study area, the native variety of ginger is called "Kpatam-Ham" while the borrowed variety is called "Tsitta" or "Citta" in Jaba dialect (Musa, 1989).

4.2.2 Value of Ginger to Man:

The most distinct characteristic of ginger which makes it indispensable in the culinary art of today is that, like all spices, it is "aromatic" and "pungent" (Hastie, 1958). According to Lewis (1958) and Akamine (1962), the crop has an economic value that centres around its use in the preparation of medicines, foods and manufacture of beverages and perfumes. Rodriquez (1971) observed that ginger is also used as a digestive stimulant, anti-periodic and carminative. Moreover, it serves as a remedy for dyspesia, cold, headache, toothache and gout.

In industries, many items are manufactured locally from ginger and blended with other spices for general household use. For instance, ginger is in demand for use in the manufacture of ginger beer, ginger ale, ginger bread, ginger oil, ginger essence, ginger chocolate, ginger tea, pasties, biscuits, sausages, etc. (Rodriquez, 1971; Patel, 1972; and Whiley, 1974). A substance which has the pungent properties of ginger as well as containing essential oil called ginger oleoresis, is obtained from the ground rhizome of ginger by extraction with volatile solvents. Through steam distillation, essential oil which has no pungency is derived from the rhizome. The oil is used for flavouring foods, particularly confectionaries and soft drinks, and to some extent, as a modifier in perfumes and toilet waters of the spicy types - "to impart a lasting and oriental tone" (Tara, 1985). According to the technical manager of Kachia Ginger Processing Industry (Field Survey, 1992), extraction of this essential oil from ginger rhizome is one of the objectives for establishing the industry. He further informed the researcher that the industry has ready market for its produce. For instance, one litre of the industry's oil sells at 300 British Pounds, and is in high demand in Europe and America, he said.

To the producer, ginger is essentially a cash crop, though a little quantity of it is used to add taste to soup, porridge and other household cookings. Field Survey (1992) showed that both the producers of ginger and the traders have very little knowledge of the other uses of the crop.

Of the 210 farmers interviewed, 137 (65%) simply stated that ginger is used for the manufacture of sweets and pepper-mints, while 31% said the crop is used for "yaji" (spices). The remaining 4% of the farmers claimed they do not know any other use of ginger other than as cash crop and for household use. Table 4.1 further explains.

The table also explains that 41% of the local traders knew ginger as being used for making of sweets and pepper-mints, while 38% simply said it is used as spice. Only 17% of the traders stated that the crop can also be used for food and drinks processing in industries. The urban wholesalers knew more of the uses than the other groups. About 73% of them said that the crop is used for food and drinks processing in industries, while 19% stated that it can be used for the making of medicine.

TABLE 4.1: USES TO WHICH GINGER IS PUT AS KNOWN TO RURAL PRODUCERS AND TRADERS

USES	PERCENTAGE OF RESPONDENTS		
	PRODUCERS	LOCAL TRADERS	URBAN WHOLESALERS
Processing of foods and drinks	-	17	73
Making of sweets and pepper-mints	65	41	-
Making of medicine	-	2	19
Used as spices	31	38	8
Do not know	4	2	-
Total	100	100	100

SOURCE: Field Work, 1992

4.3 ORIGIN AND SPREAD OF GINGER

Although very little is known about its origin, ginger has a long history. There is a general acceptance that it is a native of the tropics from where it spread to the other warmer parts of the world (Freeman and

Chandler, 1907). Purseglove (1975) attributed the spread of ginger to Arab traders who took the plant from India to East Africa in the 13th Century, while the Portuguese brought it to West Africa and other parts of the tropics in the 16th Century. In the opinion of Momber (1942), however, the existence of some while forms of ginger known as "Kpatam-Ham" in Jaba dialect within the study area "gives an indication that Nigeria could be a possible centre of origin of ginger". The assertion of Edwards (1975) is that ginger originated from Jamaica. From all these, we can therefore accept the conclusion of Roddriquez (1971) which said "the centre of origin for ginger is uncertain and has not yet been confirmed".

Apart from these countries of possible origin, ginger is also grown in China, Srilanka, Taiwan, Philippines Islands, Malaysia, Liberia and Mauritius.

Field Survey (1992) shows that 55% of the farmers have been growing ginger in the study area before independence (1960), while the number of producers has been increasing yearly.

4.4 VARIETIES OF GINGER

There are several varieties of ginger worldwide. Institute of Agricultural Research, Ahmadu Bello University, Zaria in its 1966/67 report, suggested that there are four distinct cultivers of ginger. Major producing countries like Jamaica and India have what is known as "elite" variety. In Nigeria, two varieties are cultivated namely, the white and the yellow ginger. The yellowish variety with plum rhizome is called 'Tafin Giwa' in Hausa (meaning palm of elephant), while the white, small compact rhizome is called 'Yatsun Biri' in Hausa (meaning fingers of monkey). There is a third variety, rather smaller and darker called 'Tsitta nasara' (foreign).

The 'Tafin Giwa' is regarded as the most productive type in the study area. It is easier to peel, larger and thicker in size, and tends to have more weight than the others (Duka, Shanono and Ratnam, 1985). According to Erinle (1988), the foreign variety is still on trial. Moreover, while 'Tafin Giwa' yields 8.55 tons per hectare, 'Yatsun Biri' yields 8.00 tons per hectare.

4.5 ENVIRONMENTAL FACTORS SUITABLE FOR GINGER PRODUCTION.

4.5.1 Water Requirement:

According to Agricultural Extension, Research and Liaison Services, Ahmadu Bello University's report of 1987, ginger requires abundant rainfall (about 1,000mm) distributed over 6 to 8 months during the growing season. The paper also reported that ginger can also be grown as an irrigated crop in areas with less rainfall. Where rainfall is less than 1000mm but not less than 900mm, irrigation can help to give a good result. The findings of Okwuowulu et al (1984) are that moderate rainfall from the time of sowing till the completion of germination, a fairly heavy rainfall during growing season and no rainfall from about a month prior to harvest, are optimum for a successful cultivation of ginger. The crop cannot withstand water-logging as it is detrimental to good development. Moreover, "the differences in the time of the year to sow ginger in different locations in the world are made to coincide with the period when the rains become regular (Okwuowulu et al, 1984). However, yield differences are entirely not due to climatic conditions.

4.5.2 Temperature:

Another environmental factor essential for successful cultivation of ginger is high temperature during the growing period. In savanna zones (grass land areas), ginger does well under lower temperatures. Day temperature could range from 23 - 35°C (Agricultural Extension, Research and Liaison Services, Zaria, 1987).

There has not been much research work on the effects of temperature on ginger production in Nigeria. Though, Islam et al (1988) observed that the effects of temperature on germination and early growth of ginger in the field was due to "sub-optimal soil temperatures". The continuous exposure of rhizomes to a temperature of 30°C (slightly above optimum of 25 - 26°C) causes accelerated germination and growth (Evenson, et al, 1978). Also, germination does not start until the soil temperatures at about 150mm deepth exceeds 20°C. The most favourable growth is obtained at soil temperatures between 25 and 30°C. Leaves burn and chlorophyll destruction occur under temperature conditions that are excessive.

Since ginger is susceptible to frost injury, and high temperature is needed for optimum growth, its cultivation is naturally most successful in tropical and sub-tropical regions of the world; and particularly those tropical regions that do not have excessive temperatures (Whiley, 1974). In the study area, mulching helps in achieving optimum temperature. That is possibly why all the 210 producers of ginger interviewed in the study area mulched their ginger beds. Even where herbicides were used, the beds were still mulched to obtain desirable temperature.

4.5.3 Other Factors for Ginger Production:

There seems to be very little research work done in Nigeria on the effect of sunshine, frost or harmattan on ginger. However, Whiley (1974) reported that sunburning of the newly emerged shoot can be serious problem when screen temperature exceeds 32°C. High light intensity causes leaf effect of the crop. Harmattan conditions have been reported to be essential for the process of curing and bleaching of ginger.

Okwuowulu and Ene (1988) reported that ginger is susceptible to weather fluctuation which is a typical environmental factor in some ginger growing areas. As earlier stated, ginger is susceptible to high light. The ideal atmospheric condition for ginger is warm and copius rather than hot and eratic sunshine. The plant has low light saturation point. For, when the sunshine is high the leaves tend to curl up thereby destroying the leave tissue. So, delicate as it is, ginger needs favourable environment to grow well and give good yields. Field Survey (1992) confirmed Okwuowulu and Ene's (1988) study which said that favourable condition both through natural means and human efforts exist in the study area for the production of the crop.

4.6 CULTURAL PRACTICES AND MANAGEMENT OF GINGER

4.6.1 Growth and Development:

According to Duka, Shanono and Rathnam (1985), farmers in the study area do select a site with a gentle slope for growing ginger. Such sites, in addition, are places where cattle had stayed. The land is further well manured with 3 to 4 truck loads of farmyard manure. Farmers who do not have such land look for where refuse are thrown for growing ginger. Where these cannot be found or not enough, fertile farmlands are chosen. Others simply select suitable land and carry household refuse to enrich the farm. In some areas, forests are cut down and burnt for the crop to be planted. Recent discovery of the use of chemical fertilizers for ginger production has made the choice of site for ginger growing much easier. Since fertilizer is used to enrich the soil, any well-drained suitable place in the study area can be used to grow ginger. The crop can be best grown on sandy loam soils (Whiley, 1974). The soil should be capable of holding enough nutrients and water within 20cm zone to sustain the crop for its duration of growth.

4.6.2 Preparation of Site and Tillage Practices:

Preparation of site for ginger growing starts at last rains in October and continue till the months of April and May. Field Survey (1992) shows that in October, when it has stopped raining and before the land dries up and becomes hard, the farmers start the first tilling of the land where cattle have occupied during the raining season. Such sites are often at the fringes of the cropped lands or at far away uncultivated lands, considered not very suitable for the growing of other major crops. Due to the fact that such lands had been occupied by cattle during raining season, they are often very hard, having formed hard pans. Because of this hardness, the native hoe known in Hausa as 'Galma' is often considered as not being strong enough to till (plough or 'Kaptu' in Hausa) the land to good depth. So, diggers and/or 'Dundulusu' (long plade hoe similar to digger but with a wider plade than a digger) is used. During the first rains in March or April, the ploughed land is harrowed (tilled up again or broken into smaller pieces) before planting starts. Some farmers leave the ploughing or first digging till the first rains in March or April when they are done at the same time with harrowing, though it is more difficult to till the land at this time.

In places of plentiful farmyard manure or cow dung, the surplus is carried to places where farmyard manure is insufficient. Where forest areas are selected, all shrubs and small trees are cut down and burnt, and the big native hoe, digger or 'dundulusu' is used to plough the land and uproot the roots. In the case of backyard, the refuse is collected and burnt before the land is cultivated. Whether the ploughing of land is done in October or during the planting season in March, all soil lumps must be broken down into small particles (harrowed) before planting is done. Where this is not done, it becomes difficult for the shoots of the crop to come out (germinate) at a desired time.

Field Survey (1992) discovered that it costs about 50% more to plough than to harrow a piece of land for ginger production. For instance, the average cost for ploughing $\frac{1}{8}$ of a hectare was ₦155, while the average cost for harrowing the same piece of land was ₦105. Ginger thrieves even in soils less than 30cm deep.

4.6.3 Fertilizing the Ginger Crop:

As earlier discussed, the farmers normally look for land where cattle had occupied or refuse dumped and use such land to grow ginger. Since such lands are already very fertile, they apply none or very little artificial fertilizers. On farm lands where cattle have not settled and farmyard manure or refuse not heavily applied, artificial fertilizers like supper-phosphate, sulphate ammonia, and/or NPK are heavily applied.

Manure and fertilizer applications are done by broadcast (Field Work, 1992). Application can be either before ploughing, after ploughing or after sowing. Fertilizers' application can also be done after mulching and/or after weeding.

Ginger benefits greatly from the application of manures. While Institute for Agricultural Research, A.B.U. Zaria recommended in its 1966 report that 7.5 tons of well decomposed cattle manure, refuse dump or compost be applied to every hectare of ginger farm land, Agricultural Extension, Research and Liaison Services, A.B.U. Zaria, in its 1987 report recommended that where available, 25 to 30 tons of organic manure be applied to every hectare. The use of inorganic fertilizers is however fast replacing the traditional use of organic manures. It was again recommended that the NPK 15-15-15 (compound) fertilizers should be applied 6 to 8 weeks after planting at the rate of 350 - 400kg per hectare, which is approximately 7 to 8 standard 50kg bags (AERLS/A.B.U. Zaria, 1987).

Okwuowulu __et al__ (1987) stressed that the time of application does not produce significant yield differences and suggested that to save labour cost, application can be done at the time of planting. The discoveries of Njoku and Ohiri (1988) are that soils difficient in Nitrogen, Phosphorous and Potassium give very poor yields and so, artificial fertilizers must be heavily applied on such soils. Field Survey for this study (1992) revealed that the farmers applied more than the recommended 400kg per hectare of inorganic fertilizers. The farmers claimed they applied an average of two (2) bags per $\frac{1}{4}$ of a football field - an average of 16 bags per hectare.

4.6.4 Planting Methods and Arrangement:

Although ginger can be grown on ridges, most of the ginger grown in the study area was on flat beds of between $10m^2$ and $10,000m^2$ with an average of $400m^2$ called "Bir Tsitta" or "Tok Tsitta" in Jaba dialect (Field Survey, 1992). The flat beds are raised up to 30cm of height. Orkwor __et al__ (1988) recommended that under rainfed conditions, ginger should be planted on raised beds of 1m wide and of any convenient length. Ginger grown under irrigation or "Fadamas" should be on ridges whenever necessary as the crop is sensitive to water-logging.

According to Duka, Shanono and Rathnam (1985) and ardence from the present study, the people of the study area carry out planting of ginger by making holes with 'garma' (ridging hoe) or normal weeding hoe 10 - 15cm apart both between rows and between stands (plants). The holes are about 6cm deep. Planting is best done by two people - one making the holes and the other dropping a piece of ginger seed in each of the holes. In the process of covering the seeds in each of the holes, new ones (holes) at the desired intervals are made so that the soil from the new holes are used to cover the seeds of the old ones (see **Figure 4**).

4.6.5 Ginger Seeds and Sowing Times:

The seeds of ginger are got through cutting the rhizome into small pieces each with at least a bud (an 'eye' or shoot) or two. A rhizome of an adult's palm size can be cut into about ten (10) small pieces for seeds.

Planting time has been discovered to have considerable influence on the yields of ginger. In the study area, planting starts during the first rains in April or at times, March where rain comes early. Early planting ensures optimum vegetative growth and thus good yields. Late planting does not meet environmental conditions necessary for strong shoots to germinate, and the end result is poor yields.

4.6.6 Mulching of Ginger:

Preparation for mulching starts in November and December when grasses start drying. After ploughing ginger farms (Kaptu in Hausa) from October to November, farmers start cutting grasses which will be used for mulching. This cutting of grass continues till after planting and mulching are completed. Where dry grass is not cut, then shrub leaves or tree leaves are cut at the time of planting and used to mulch the flat bed.

Immediately after planting, mulching with the dry grass or green leaves is done in order to preserve moisture and to reduce weed growth. It also help to maintain a desirable temperature for the crop. Moreover,

FIGURE 4: Planting Methods on Flat Bed

when the grasses or green leaves decompose, they help to enrich the nutrient of the soil with organic matter for the benefit of the crop. Mulching also help to break the force of the landing rain drops, thus, reducing erosion. The importance of mulching in the production of ginger has been recognised for quite a long time. For instance, Orkwor et al, (1988) reported that mulching is an important agronomic practice in ginger production which is necessary for early and even sprouding, growth and good yields. Menta (1987) said that mulching helps to increase the number of off-shoots, plant height, leaf area, stem rhizome and root dry weights.

In a study conducted on the effects of mulching, periods of weed interference and chemical weed control of ginger, Olorukooba (1987) discovered that the use of grass mulch results in lower weed infestation and more vigorous growth of ginger as compared with unmulched plots of chemical weed control. He said that mean dry rhizome yield of mulched plots was about 37% higher than that of unmulched treatments.

Field Survey (1992) indicates that majority of the farmers cut the mulching grass by themselves, while some of the farmers cut some and buy some of the grasses. Table 4.2 shows that only 11.5% of the 210 producers interviewed purchased all the grasses needed for mulching, while 25.2% cut some and purchase some. The remaining 63.3% cut the grass by themselves and members of their families.

It is probably due to its high importance that mulching grass costs a lot in the study area. Again, Field Survey (1992) reveals that it costs on the average ₦204 to buy grass that will mulch ⅛ of a hectare of ginger farm plot.

TABLE 4.2: HOW MULCHING GRASS IS PRODUCED

SOURCE OF GRASS	RESPONDENTS	PERCENTAGE
Cut all by self	133	63.3
Cut some and purchase some	53	25.2
Purchase all	24	11.5
Total	210	100

SOURCE: Field Survey, 1992

4.6.7 Other Management Practices in Ginger Production:

Njoku and Ene (1987) described ginger as being "a heavy feeder". That is, it requires a very fertile soil to yield well, and should not be grown on the same field continuously as that will result in rapid yield decline due to rapid loss in nutrient status. They adviced that ginger production be rotated with crops like sorghum, maize, cassava, cowpea and cotton. Field Survey for this study shows that the farmers practice such rotation. When asked whether while allowing ginger farms to rest other crops are grown, the answer from the 210 ginger producers interviewed was 100% yes. The crops grown in the first year of rotation are guinea corn, maize and soya beans, 53%; yam, cassava, 5%; acha/groundnut/millet/achi shuru, 32%. The second and third years crops cultivated on the resting (fallowed) ginger farm follow almost the same pattern of distribution.

Sloping land is an advantageous ground for ginger growth as the crop is sensitive to water-logging conditions. Where ginger is grown on ridges, "earthening" up will be important so as to keep the growing rhizomes below the soil surface. In addition to earthening up, mulching throughout the growing period helps to prevent the exposure of the rhizome (Njoku and Ene, 1987).

4.7 PROTECTION OF GINGER FROM WEEDS, PESTS, AND DISEASES

4.7.1 Weeding and Weed Control:

Ginger farmers put a lot of effort on the weeding of the crop, especially that ginger cannot stand weed competition. A ginger farm should be weeded at least three times depending on the degree of weed infestation.

The first weeding is done about four weeks after planting. By 8 and 16 weeks after planting, the second and third weedings are respectively carried out. Where need arises, more weeding is done (Tarah, 1985). All these weedings are done by picking the weeds in between ginger stand with hand.

Herbicides have been discovered to be useful for the control of weeds on ginger farms. The most commonly used herbicides are the pre-emergence type that is used for growing groundnut and other root crops. This is because herbicides for ginger are not presently common in the market.

Comparing the cost of herbicides usage and hand weeding, Orkwor and Ezeh (1988) discovered herbicides to be a little cheaper than traditional hand weeding method. Field Survey for this study proved this wrong, as costs of herbicides have gone far beyond the reach of the average farmers. Presently, 94% of the 210 ginger producers interviewed did not use herbicides. And, only 25% of those who used herbicides in the past, still used it at the time of Survey (1992).

Chemically treated weed control lands were discovered by Olorukooba (1987) to be yielding 37% less, where mulching is not carried out as compared to mulched farms of the same size whether treated with herbicides or not. Farmers who used herbicides still prefered to mulch the farms after treatment with pre-emergence chemicals. The one advantage of herbicides usage is that it enables farmers to cultivate larger farms and spending no time on weeding, and not on yield difference (Olorukooba, 1987).

4.7.2 Diseases of Ginger:

One of the greatest problem of ginger production is how to come about disease control. Common diseases of the crop are fungi, bacteria, viruses and nematodes. These diseases attack the leaves, roots, shoots and rhizomes of ginger plant causing serious yield loss. Some of these diseases attack the crop not only in the field but also in the storage house. The discoveries of Duka, Shanono and Rathnam (1988) are that farmers in the study area do not treat seeds before storage. Field Survey for this study confirmed this to be 100% true.

Observed diseases of ginger in Nigeria and other ginger growing countries include leaf spot, wilt, soft rot disease of rhizome, dry rot and mosaic disease. The most serious disease that farmers face in the study area is rhizome rot in the storage of fresh ginger for seeds. This disease makes seeds storage very difficult and unreliable (Tarah, 1985).

Control of these diseases is by the use of crop rotation and early land preparation which controls nematodes attack on seed pieces. Seeds are also treated with chemicals before storage.

4.7.3 Pests and Insects of Ginger:

Research work of Atu (1988) shows that pests damage on ginger is scanty. Stem borer and termites are the most aggressive pests. Termites easily gain ground through the mulch grass. Rodent attack on ginger is not common. Areas where rodents destroy other crops, ginger is grown there without any harm to the crop.

4.9 HARVESTING OF GINGER

Harvest of ginger starts from the month of November and lasts up to April. Harvest starts when ginger leaves turn yellow and gradually dry up. Farmers remove the dry leaves and dig with native hoes ('garma' or 'dundulusu').

After digging up a plant, the soils attached to the rhizome are removed and the rhizomes kept in heaps. Digging is carefully done so that the rhizome is not damaged. Damaged rhizomes tend to reduce the value of the produce. Damage also causes fungus development which in turn leads to soft rot disease (Duka, Shanono and Rathnam, 1985).

During the survey for this study it was found that harvesting of ginger is as difficult an exercise as other farming activities, if not more. That probably explains why only 54.3% of the 210 producers interviewed carried out the digging activity without hiring people to work for them, as compared to other farming operations like ploughing 70%, sowing 94%, weeding 63%, etc. Again, it costed on the average ₦135 to dig $\frac{1}{8}$ hectare of ginger farm.

The transportation of produce from the farm to producers' houses was mostly done by head portage. About 83% of the 210 ginger producers interviewed in this study transported ginger by head portage to their houses. Those who hired vehicles paid ₦92 (on the average) for each trip of the vehicle, costing approximately ₦180 for the $\frac{1}{8}$ hectares farm size.

4.10 POST HARVEST TECHNIQUES

4.10.1 Storage Techniques:

This, too, is quite an important aspect in ginger production since fresh seed rhizomes have to be properly preserved for about five months from the time of harvest till the date of planting. In this case, preservation is aimed at raising seeds for the next season's crop production.

This seed storage involves the keeping of fresh rhizomes in a corner of the living room or in huts within or around the compound. These huts may not have good measures of protection. Some of the rhizomes are stored in deep pits under shade of trees with good coverage (Field Survey, 1992). Duka, Shanono and Rathnam (1985) are of the opinion that this system of storage "is not the ideal one". They stressed that a better seed storage is to leave the seeds in the ground and mulch with enough grass at the end of the rains until the next planting season. Although field observation shows that some of the farmers preserved by the suggested method of this team, they do not preserve in this way for seeds but to allow the farm to grow for another season ("Tsuma") before it is harvested. This practice is done on those farms that show signs of poor yield. Where the farmer feels he will harvest at a loss, he simply mulch the farm and allow the rhizomes to grow at another season.

The storage of dried peeled and/or dried spilit ginger is in sacks (bags). These jute bags are then kept on the floor in store houses, or in living rooms where they are in small quantities. There is hardly any serious damage to dry ginger in the store house, provided the floor of the house is dry. Even where rodents attack the store house, they only destroy the sacks.

In this study we found that 128 of the 210 farmers (61%) interviewed considered seed storage as their greatest problem in ginger production, followed by market problems.

4.10.2 Preparation of Ginger Rhizome for the Market:

When the harvested ginger is carried home, it is stored for processing and for seeds. Farmers in the study area followed two ways of processing ginger rhizomes for sale. One of the ways of processing is peeling, scrapping or skinning of the top skin (scale) of the rhizome. The peeling is done with the use of a blunt knife to scrape parts or all of the outer skin of the rhizome. The other way of processing the crop is through splitting or slicing of the rhizome into two halves. This is done with the use of a sharp knife to slice or split the rhizome longitudinally through its edges (sides) into two (see Figures 5 and 6).

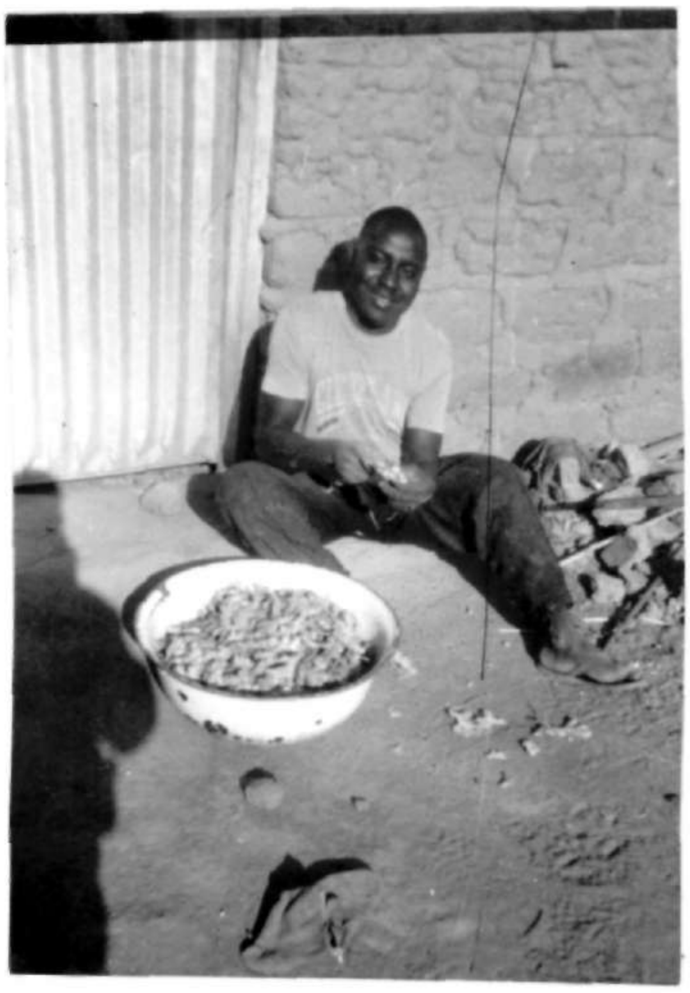
Split or scrapped ginger rhizomes are spread thinly on the floor in an open space until they are sun-dried. Sun drying is cheap and involves less loss of essential oils from the rhizome. Harmattan wind also contributes to bleaching of the rhizomes (Duka, Shanono and Rathmam, 1985).

The recommended way of processing ginger for better sale is peeling off all the skin. However, peeling is very labour intensive. Fast peelers will have to take three working days to peel a sack load (100kg) of fresh ginger. That is why peelers of the crop hardly do it in the recommended way, instead of peeling all the parts they scrape just parts of the rhizome.

If one decides to split or slice his produce, he will be able to split two sacks of fresh ginger in a day. It therefore implies that it is easier to split than scrape ginger. However, scrapped ginger sells better than the sliced ones (Ibrahim, 1985). The survey for this study shows that all the processings (peeled or sliced) are manually done and no machines have been deviced to split or scrape ginger for sale in the study area.

Of all the markets of study, none of them was seen selling scrapped ginger. Moreover, none of the producers interviewed mentioned peeling the crop for sale. This is an indication that scrapped ginger is hardly in existence for sale in the study area. It was also found during the survey that an average cost of hiring labourers to slice a sack of fresh ginger was ₦15.50 (on the average).

FIGURE 5: SLICING THE RHIZOME THROUGH ITS EDGES INTO TWO HALVES FOR DRYING.



SOURCE: FIELD SURVEY, 1992.

FIGURE 6: SPLIT RHIZOMES THINLY SPREAD ON THE FLOOR IN AN OPEN SPACE TO DRY.

SOURCE: FIELD SURVEY, 1992

4.10 THE MARKETING OF GINGER

In the study area, ginger is basically grown for cash, except for occasions where a little quantity of it is added to porridge or soup for flavour, or used as medicine. The dried rhizomes of scrapped and split ginger are sold either at home, on the way to the market or in the market places. Most purchases of ginger from the farmers are done by intermediaries in open weekly market places.

There is no fixed season for purchase of ginger in the study area. The crop is brought to the market in small quantities every market day. However, the main season of sale is between November and April, the time of harvest. Purchase is done through haggling. The farmers sell to the intermediaries in baskets, large and small basins ("Kwano kaya" in Hausa) and 50kg fertilizers' bags. Very few of the farmers sell in large bags (sacks). Most of the farmers interviewed (87%) sold in small containers. This may suggest that most of the ginger prices we get from marketing boards are intermediaries' prices and not producers' prices (see Fig. 7).

Traders of ginger in the study area are in the following main categories:

1. Rural middlemen who buy the crop from the producers.
2. Rural assemblers who buy both from the middlemen and directly from the farmers.
3. Wholesalers (mostly urban based) who buy from rural assemblers and sometimes have their agents buying from rural middlemen.

This research work did not give much consideration to rural retailers and urban retailers who constitute a very small number of the traders.

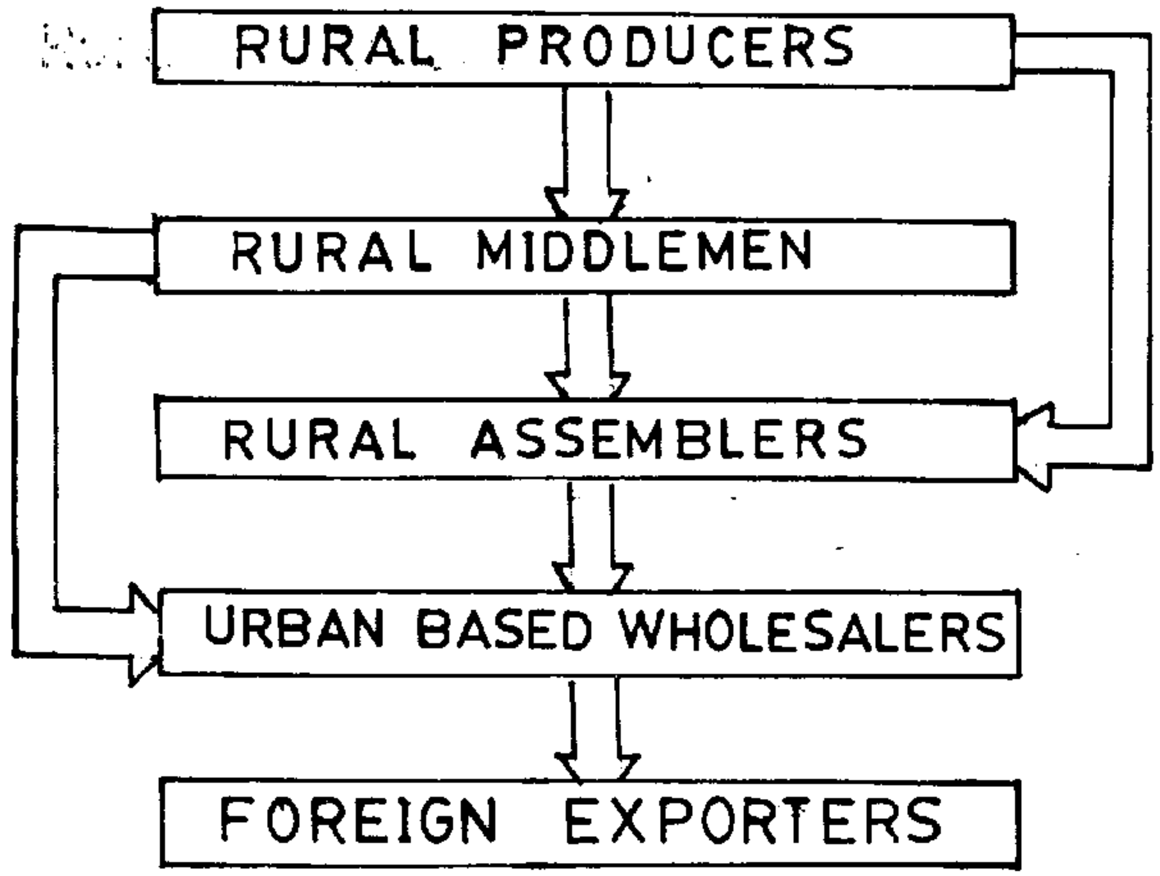
Rural middlemen buy from the producers in bits and pack them in sacks or larger standarised containers through which they sell to the rural assemblers. Rural assemblers buy in sacks (bags) or large containers

FIGURE 7:

FIGURE 7; A LARGE BASIN (KWANO KAYA') OF GINGER READY FOR SALE BY THE FARMER.

SOURCE: FIELD SURVEY, 1992

FIGURE 8 MAIN MARKETING CHANNELS FOR GINGER



("Kwano kaya") and either pack the crop to their stores from where they sell to urban wholesalers, or sell it directly in the market to urban wholesalers. The urban wholesalers load the crop in lorries and transport it to the sea-ports, where they sell to foreign firms. Some of the wholesalers sell the commodity to urban processing industries. Those bought by foreign firms are exported outside the country. The next chapter treats what happens to the ginger produced in the study area much better.

CHAPTER V

ANALYSIS OF DATA

5.1 CHARACTERISTICS OF GINGER PRODUCERS IN THE STUDY AREA

5.1.1 Demographic Characteristics:

Table 5.1 shows the age distribution of the respondents in the study area. The majority of the farmers are middle age persons with an average age of 44 years. In addition, 87% of the farmers interviewed were male. Being farmers, most of the respondents (91.9%) were married, while 5.2% and 2.9% were singles and widows respectively.

TABLE 5.1: AGE DISTRIBUTION OF PRODUCERS

AGE GROUP	NUMBER OF RESPONDENTS	PERCENTAGE
20 – 29	10	4.8
30 – 39	52	24.8
40 – 49	93	44.2
50 – 59	50	23.8
60 and above	5	2.4
Total	210	100

SOURCE: Field Work, 1992.

5.1.2 Educational Background:

The educational background of the farming respondents indicates that majority of the farmers can, at least, read and write in Hausa. This is because only 29 (13.8%) of the 210 farmers interviewed said they have had no formal education at all. While 33.8% have attained adult education only, 22.4% have received some primary education only. About 10% of the farmers compl eted primary school education, 4% did not complete secondary education, while 11% completed their secondary education. The percentage of those who attained post-secondary education was 5.0%.

5.1.3 Occupational Distribution:

The main occupation of the ginger producers was farming, as claimed by 83.8% of the respondents. There were 5.7% and 6.2% respectively of those with trading and civil service as their main occupation. Farming was undertaken as secondary occupation of all those who did not take to it as first occupation.

Other main occupations of the farming respondents include tailoring (2%), carpentry (1%), and weaving (0.5%). Trading was the most embraced secondary occupation in the study area (38%), while 37% of the respondents were without secondary occupation.

5.2 USES OF FARMLANDS BY THE FARMING RESPONDENTS

5.2.1 Methods of Land Acquisition in the Study Area:

Land in the study area was acquired essentially through inheritance. Out of the 210 producers of ginger interviewed, 121 (57.6%) acquired land through inheritance only, while 21.9% acquired land through both inheritance and pledging. The percentage of those who acquired land through inheritance and hiring as well as gift was 19.0%. This implies that a total of 98.5% had at least part of their farmland acquired through inheritance (see table 5.2).

5.2.2 Size Distribution of Farm Holdings of Respondents:

The distribution of land which is an important factor of agricultural production is a vital aspect of agricultural economies. Farmland holdings determine the extent of farming operations. From the Field Survey for

TABLE 5.2: METHODS OF LAND ACQUISITION

METHODS	RESPONDENTS	PERCENTAGE
Inheritance only	121	57.6
Pledging only	1	0.5
Gift only	2	1.0
Inheritance and pledging	46	21.9
Inheritance and leasing (hiring)	32	15.3
Inheritance and gift	8	3.8
Total	210	100

SOURCE: Field Work, 1992

this study, we can generally group the farmers into three (3) categories according to the size of their farm holdings viz: small farmers (those operating less that 5 hectares of land); medium farmers (those operating between 5 and 8 hectares) and large farmers (those operating more than 8 hectares). Usually, most of the farmers (94.9%) belonged to the first category, and 1% belonged to the last category. The remaining 4.1% belonged to the second category.

The average distance of the two largest farm plots of the farmers was 2.5km, while the average hectares of farmland cultivated each year was 4.37 ($\simeq$ 4.4). Out of these cultivated farm plots, the average size of them devoted to ginger production by each farmer was 1,307.19m^2. Moreover, a sample measurement of 28 farm plots (one from each of the sampled villages) puts an average size of each ginger farm plot at 427.53m^2. The average number of ginger farm plots per farmer in the study area was 3.

Since the average cultivated farm plots per farmer was 4.37 hectares while the average size of this land used for ginger production was 1307m^2, the percentage of the cultivated farmland used for growing ginger was 3%.

5.2.3 Other Crops Produced by Ginger Farmers:

The ginger producers grew other crops, Cereals such as guinea corn, maize, millet, and acha were the stable food crops of the people. Rice was grown more as a cash crop than as food crop. Tubers like cocoyam, cassava, and yam were produced essentially for household consumption. Two main varieties of beans were grown in the study area: one was "Achi shuru", and the other was garden beans (grown mostly at backyards). Oil seeds like soya-beans, groundnuts and bambara-nuts were also grown. Groundnut and sugar-cane were produced there for cash.

Certain categories of these crops were grown together on the same piece of land. For instance, 80.1% of the farmers grew guinea-corn, maize and soya-beans on the same farm plot. Yam, cassava and cocoyam were also grown together on the same piece of land. Rice was mostly sole cropped, while acha was grown together with beniseed. 'Achishuru', groundnut and acha were grown and harvested before millet was planted on the same piece of land.

Ginger was often grown with either pepper, okra, cocoyam or with all of them on the same piece of land.

An assessment of the crops grown together with ginger indicated that they yielded well (80% of respondents). Only 5% of the 210 respondents said they yielded poorly, while 15% said that the crops yielded as if they were sole cropped. Table 5.3 further explains.

TABLE 5.3: ASSESSMENT OF CROPS GROWN TOGETHER WITH GINGER

ASSESSMENT	RESPONDENTS	PERCENTAGE
Yielded very well	71	33.8
Yielded well	97	46.2
Yielded poorly	10	4.8
Just like sole copping	32	15.2
Total	210	100

SOURCE: Field Work, 1992

5.2.4 Distance From Residents to Farmlands:

The average distance to the first ginger farm plots of the respondents was 434.3m. The second and third ginger farmlands were averaged 559.3m and 1.011km distances from farmers' places of residents respectively, while the fourth farm plots were 2.12km of distances. This information, compared to that of distances from places of residents to first, second and third food crops farms at 1.3km, 1.7km, 4.3km respectively, indicates that ginger farm plots were located nearer to places of residence than the food crop farms. Table 5.4 gives more information about that.

TABLE 5.4: DISTANCES FROM PLACES OF RESIDENTS TO FARMLANDS

FARM PLOTS	AVERAGE DISTANCES	
	GINGER FARMS	FOOD CROPS FARMS
First Farm Plots	434.3m	1.269km
Second Farm Plots	559.3m	1.712km
Third Farm Plots	1.011km	4.34km
Fourth Farm Plots	2.12km	3.15km
Total Average	1.03	2.617km

SOURCE: Field Work, 1992

5.2.5 Ginger Growing Among Farming Respondents:

Ginger production has a long history in the study area. As earlier stated, the old variety of ginger has been in existence in the area since the time they settled there, and is claimed to have originated there (Momber, 1942), while Turu (1987) asserts that modern variety has been in production since the 16th Century. From the field survey for this study, it was revealed that 55.7% of the respondents have been growing ginger even before 1960 (independence). Nothing had stopped any of them from growing ginger each year except the past civil war and ill-health. For, among the 3.3% of the 210 respondents who said they had at one time in life gone a year or two without growing ginger, 2.3% attributed such a break to the Nigerian civil war, while the remaining 1% did not grow due to ill-health.

Another probable reason why the producers hardly put a break to the production of the crop for even a year, as discovered by the researcher, was because of the difficulty in procuring seeds of the crop. Even where there existed poor market, the producers still grew the crop for seeds (that is, in small quantity and not processed for sale) as it was difficult and expensive to buy seeds in quantities large enough to enable large production at desired years.

It was also revealed by the survey for this study that ginger was grown on a farm plot at an average of two years before rotation with other crops or before allowing the farmland to fallow. The farmland was then allowed to rest from ginger growing for an average of two years before ginger was grown on it again.

However, while the land was resting from ginger production, other crops were grown on the land. The respondents confirmed this with 100% affirmative answer. 54% and 51% of the respondents said they preferred to grow maize, guinea corn, acha and soya beans on past ginger farms for the first and second years respectively, while the rest of the respondents preferred to grow root crops like yams, cassava, sweet potatoes and cocoyams.

The assessment of crops grown on past ginger farm plots, as shown in Table 5.5 indicates that past ginger farmlands were very fertile. For, 55.7% of the farmers said that the crops yielded very well, while 39% simply said they yielded well. While 4.3% felt that there was no difference in yield, only 1% thought the crops yielded poorly.

TABLE 5.5: ASSESSMENT OF CROPS GROWN ON PAST GINGER FARMLANDS

NATURE OF YIELD	RESPONDENTS	PERCENTAGE
Yield very well	117	55.7
Yield well	82	39.0
Do not yield well	2	1.0
No difference	9	4.3
Total	210	100

SOURCE: Field Work, 1992

Table 5.5 further indicates that ginger production has some good effects on other crops as it helps to make the land fertile for other crops to give better yields. This goes in line with the observation made by 31% of the respondents about the good effects of ginger production on other crops which they said helped to enrich their farmlands. The one other similar observation by 32.8% is that ginger production helped to provide fund for the purchase of fertilizers. Some respondents which all together constituted 5.8% believed that ginger production helped in expansion and reclamation of land holdings, softening of the soils of hard lands and putting land area of high pest attack into good use. Table 5.6 carries the details.

TABLE 5.6: EFFECTS OF GINGER PRODUCTION ON OTHER CROPS

GOOD EFFECTS	RESPONDENTS	PERCENTAGE
Helped enrich the farm	66	31.4
Provided fund for fertilizers	68	32.4
Expansion and reclamation of land holdings	3	1.4
Softening the soil	2	1.0
Grown on pests infested land	5	2.4
All of the above	2	1.0
No good effect	64	30.4
Total	210	100
BAD EFFECTS	**RESPONDENTS**	**PERCENTAGE**
Used up good fertile land	58	27.6
Costed a lot of their time	54	25.7
Costed a lot of their fertilizers	10	4.8
No bad effect	88	41.9
Total	210	100

SOURCE: Field Work, 1992

Even with its good effects on other crops production, 27.6% of the farmers felt that ginger production took up their good fertile land at its richest time. While just 4.8% of the farming respondents were with the opinion that the fertilizers that could have been used for the growing of other crops was sometimes diverted to ginger production, 25.7% said that ginger production took up their time at those moments other crops equally needed their attention. Despite all these assertions, 41.9% of the producers felt that ginger production had no side effect at all.

The nature of labour supply on the farmers' farms was mainly through the use of self and family labour (63.8%). Some other forms of labour supply were through co-operatives (8.9%) and hired labour (21%).

The average number of people that regularly worked on their farms was 7. As to whether they felt they had adequate manpower for their farming operations, the answer was yes (51%) and no (49%). What this implies is that about half of the respondents felt they had adequate manpower while the other did not think so. To those who felt they required more manpower, 46.7% of the 107 respondents that said no, thought that maize, guinea corn and ginger were the crops that needed more man-power, while 32% simply said that it was ginger and acha that required the extra manpower. Table 5.7 tells more.

TABLE 5.7: CROPS THAT REQUIRED MORE MANPOWER

CROP	RESPONDENTS	PERCENTAGE
Maize/guinea corn/acha	3	2.9
Rice/acha/ginger	14	3.6
Ginger/acha	33	32.0
Maize/guinea corn/ginger	48	46.7
Yam/ginger/acha	2	1.9
Maize/acha	3	2.9
Total	103	100

SOURCE: Field Work, 1992

When they were asked to explain why the crops required so much labour, the respondents gave the following responses:

REASONS FOR HIGH LABOUR DEMAND	RESPONDENTS	PERCENTAGE
The crops involved difficult farming operations	46	44.7
They needed proper care on time to yield well	21	20.4
They did not compete well with weeds	33	32.0
No reason given	3	2.9
TOTAL	103	100

SOURCE: Field Work, 1992

5.3 GINGER GROWING OPERATIONS AND THEIR COSTS

The production of ginger involves operations like land clearing, ploughing, harrowing, cutting of mulching grass, transportation of seeds and grass to farmland, planting, and mulching. Others include weeding, manuring, harvesting (digging), and transportation of produce home. There are occasions where herbicides are used to control weeds. Each of these farming operations is discussed in this work according to its cost per hectare.

The cost of clearing land for ginger production in the study area, according to survey carried out for this study, ranged from ₦80.00 to ₦360.00 per hectare, while the average cost for clearing such land was ₦252.00.

Ploughing of the same size of land ranged between ₦400 and ₦1,600 while the average cost for ploughing the land was ₦1,240 and ₦1,664 for using tractors. Harrowing costed a little less than ploughing, with an average of ₦840.00.

The cutting of grass for mulching was quite an expensive operation. The cost of buying grass that would mulch the 1 hectare farmland of ginger ranged between ₦640 and ₦2,000, with an average cost of ₦1,632.00. In order to reduce the cost of grass purchase, 63.3% of the respondents cut their grasses by themselves, while 25.2% cut some of the grasses and bought the rest. Only 11.5% of the respondents said that they purchased all the grasses they used for mulching (see Table 5.8).

TABLE 5.8: HOW MULCHING GRASS WAS PROCURED

METHOD USED	RESPONDENTS	PERCENTAGE
Cut all by self	132	63.3
Cut some and bought some	54	25.2
Purchased all	24	11.5
TOTAL	210	100

SOURCE: Field Work, 1992

Ginger seeds are obtained from the ginger rhizomes through good storage. Most of the farmers (82.4%) stored seeds that were used for future planting. Of the 17.6% that bought the seeds, ₦2,192.00 was the average cost of seeds that covered 1 hectare.

Seeds and grasses were again mostly transported by the farmers and members of their families (97%) to their farms. Only about 3% paid money for grasses to be carried to their farms. It cost those who paid for grass transportation an average of ₦448.00 per hectare to do so.

The sowing of ginger was again mostly carried out by the farmers themselves (94.3%). But those who paid to get planting done for them paid an average sum of ₦640.00 per hectare.

About 98% of the farmers mulched their ginger farms by themselves. But where one paid to get the work done, then he had to pay (on the average) a total sum of ₦208.00 for the same land size (1 hectare).

Of the 210 farmers, only 2 (0.9%) paid for manuring of their farm plots. They paid between ₦160.00 and ₦240.00 to get the work done for them (per hectare).

The use of herbicide was no longer very common due to the high cost. Only 12 respondents (5.7%) among the producers of ginger had ever used herbicides. Out of this number, only 3 respondents (1.4%) were still using it. It costs the users of herbicide between ₦800.00 and ₦2,800.00 for the 1 hectare farmland. The average cost was ₦1,700.00.

The cost of weeding ginger of the same size of farmland ranged between ₦400.00 and ₦1,600.00. The average cost was ₦910.40. However, 63.3% of the farmers did the weeding by themselves or with the help of their families.

Head portage/bicycle were the main means of transportation of ginger in the study area (83.3%). It cost those who paid for the transportation between ₦400.00 and ₦1,600.00 to carry the produce home. The average cost was ₦733.60.

One other input for the production of ginger included application of fertilizers. The average number of bags of fertilizers that was used for the 1 hectare farmland was 24 bags of (50kg) NPK. Using current government price per bag, it cost a total of ₦1,200.00 (including transportation cost) to apply fertilizers to the 1 hectare farm plot.

Tractors were not easily available for the farmers to use. Those available were a little more costly to the farmers than hired manual labour. For instance, the survey here shows that hired labour cost on the average ₦1,240.00 for ploughing and ₦842.40 for harrowing, while hired tractors cost, on the average, ₦1,664.00 for ploughing and ₦960.00 for harrowing of similar size farm plot (1 hectare).

When the produce had been brought home, 79.5% of the farmers split or sliced the rhizomes by themselves, and dried them for marketing, while the other 20.5% in one way or another, tried to involve hired labour to get the work done. According to 81.4% of the respondents, their greatest problem during farming operations was insufficient money to hire **labourers.** Other problems were inavailability of labour at the time it was needed (14.3%), and cost of labour being too high (4.3%).

5.4 SOURCES OF FINANCE FOR THE FARMERS

The farmers main source of finance was from their personal savings (80.5%), followed by money borrowed from relations (10%).

TABLE 5.9: SOURCES OF FINANCE FOR THE FARMERS

SOURCE	RESPONDENTS	PERCENTAGE
Personal savings	169	80.5
Borrow from relations	21	10.0
Donations from relations	7	3.3
Loan from Banks	1	0.5
Co-operative savings	1	0.5
Loan from N.D.E.	2	1.0
Selling out labour	9	4.2
Total	210	100

SOURCE: Field Work, 1992

One percent (1%) of the farmers obtained loans from the National Directorate of Employment, while 0.5% got money for farming through loans from banks. About 4% of the farmers sold their labour for money during the raining seasons (Table 5.9).

The borrowed money from banks was paid back with 30% interest, while N.D.E's loan was paid back with 10% interest. About 87.5% of those who borrowed money (especially from relations) paid back without interest.

Moreover, while 73.5% of them paid back their loans in cash, 14.7% paid back with crops equivalent. About 5.9% said they paid back their loans on instalmental basis (cash). Those who paid back their loans through giving out labour equivalent were 5.9%.

5.5 QUANTITY OF DRIED SPLIT GINGER PRODUCED IN THE STUDY AREA (1989 - 1991)

Table 5.10 carries information on the pattern of ginger production (dried split) in the study area from 1987 to 1991. The table indicates that on average basis, each farmer in the study area produced 335 kg. of dried split ginger in 1987. This rose to 460 kg. in 1988 and 475 kg. in 1989. In 1990, the average production of the crop rose to 505 kg. per farmer. The rapid increase in the production of ginger in the study area within the time studied may likely be attributed to the establishments of the Ginger Processing Industry in Kachia in 1986, and a news magazine, "The Ginger" in 1987 in Kachia. In 1991 however, there was a decline of production to 465 kg. per farmer (on the average). This happened probably because of the rapid increase in cost of input and/or poor market price of the previous year.

TABLE 5.10: DRIED SPLIT GINGER PRODUCED BY RESPONDENTS BETWEEN 1987 AND 1991 (IN TONNES)

NO.OF	MIDMARK (X)	1987 (Y_1)	XY_1	1988 (Y_2)	XY_2	1989 (Y_3)	XY_3	1990 (Y_4)	XY_4	1991 (Y_5)	XY_5
1- 5	3	73	10.95	34	5.10	33	4.95	34	5.10	45	6.75
6-10	8	125	50.0	108	43.20	99	39.6	74	29.6	79	31.6
11-15	13	7	4.55	55	35.75	64	41.6	83	53.95	90	45.5
16-20	18	5	4.5	10	9.00	12	10.8	17	15.30	15	13.5
21-25	23	-	-	3	3.45	2	2.3	2	2.3	1	1.15
TOTAL		210	70.0	210	96.5	210	99.25	210	105.25	210	98.5
AVERAGE			0.32		0.46		0.475		0.51		0.47

SOURCE: Field Work, 1992

5.6.1 Average Weight of Dried Split Ginger that could be Realised from 1 Hectare Farm Plot:

A close examination of data obtained from farmers interviewed for this study indicates that an average of 3.92 tonnes of dried split ginger could be got from a ginger farm plot of 1 hectare. Table 5.11 gives more information.

TABLE 5.11 DRY SPLIT GINGER THAT CAN BE REALISED FROM 1 HECTARE FARM PLOT (IN 50KG WEIGHT)

NO. OF BAGS	MIDMARK (X)	RESPONDENCE FREQUENCY (F)	WEIGHT IN TONNES (XF)
1 - 5	3	31	37.20
6 - 10	8	83	265.60
11 - 15	13	77	400.40
16 - 20	18	16	91.20
21 - 25	23	3	27.60
TOTAL		210	822.00
AVERAGE			3.92

SOURCE: Field Work, 1992

5.6.2 Average Weight of Fresh Ginger that could be Used as Seeds on the 1 Hectare Size of Farmland:

According to the farmers interviewed for this study, there had to be 3.52 tonnes weight of fresh ginger to be used as seeds to cultivate ginger on 1 hectare farmland.

Direct measurements showed that two bags (sacks) of fresh ginger were sliced and dried to fill or make one sack of dried split ginger. Moreover, a sack of fresh ginger is twice the weight of a dry one.

5.7 OUTLETS FOR THE SALE OF GINGER

Although 1% of the farming respondents said that they sometimes sold their produce in the farms (fresh), the crop was mostly sold when the rhizome had been sliced and dried (99%). While 32.9% of the respondents sold their produce at home, majority of them (66.1%) sold their produce in the local markets. None of the respondents claimed selling his produce to the ginger factory.

As to whom the crop was sold, 46.7% of the 210 respondents said they sold to rural assemblers only. Some (33.3%) of the respondents sold to both rural assemblers and rural middlemen. There were 3.3% urban wholesalers who bought directly from the farmers (though these farmers could not explain how they knew these buyers to be urban wholesalers). There were 0.5% urban retailers who bought from the farmers directly.

When the farmers where asked whom they preferred to sell their produce, 33.3% of those interviewed said they preferred to sell to urban wholesalers - selling at the seaports for export, while 44.3% preferred to sell to rural assemblers. Some (18.1%) of them still preferred to sell to rural middlemen, and 3.8% preferred to sell to the ginger processing industry.

When they were further asked the form in which they preferred to sell their produce, 44.8% of the farmers opted for sale of their produce fresh (without processing and drying), while 53.8% preferred to sell it dried split. Only 1.4% still wanted to sell ginger peeled and dried.

In answering the question why they preferred to sell ginger to the groups they mentioned, 71.9% of the respondents simply said 'for better price'. Some (22.9%) wanted to sell to the groups they felt were most accessible to them. About 4.2% attributed their choice of buyers to high cost of of transportation. Only 1% wanted to sell to group of their choice because of loans offered them.

As to where they preferred to sell their produce, 81.0% of the respondents preferred their produce being sold in the local markets, compared to 14.8% preferring the sale to take place in their homes. Unlike the 2.8% that preferred their produce to be sold in their farms, 1.4% preferred to sell to the ginger processing factory. About 80% of the respondents felt that their choice of place for sale would give them better prices for their produce. While 15.7% made their own choice of market place for easy accessibility to the market, 4.3% felt that their choice would both give them good price as well as easy sale of their produce.

The period of the year the farmers sold their produce was mostly within six months after harvest. For, as shown on Table 5.12, 90.5% of the respondents sold their produce between November and April, while only 9.5% still had their produce after that time. Those who retained some or all their produce for sale later in the year (May to October) did so mainly to have a source of cash to finance their farming operations, particularly to pay for labour and buy chemical fertilizers.

TABLE 5.12: PERIODS OF SALE BY PRODUCERS

PERIOD OF THE YEAR	RESPONDENTS	PERCENTAGE
November to January	89	42.4
February to April	71	33.8
May to July	15	7.1
August to October	5	2.4
November to April	30	14.3
Total	210	100

SOURCE: Field Work, 1992

Where they had a choice of the period of the year to sell their crops, 131 out of the 210 (62.4%) respondents preferred to sell during the season of high demand (May to July) for ginger by foreign buyers and period of high demand for each by producers. About 70 (33.3%) of the farmers preferred to sell at period of scarcity (August to October). Only 0.5% of the respondents opted for November to January for sale of their produce.

While 103 (49.0%) of the 210 farmers choose their time with better price and need of cash as their reasons, 47.7% simply said it was at such a time they needed money most. About 3.3% gave no reason for their choice of time.

5.9 PRICES OF GINGER IN THE STUDY AREA (1987 - 1991)

5.9.1 Introduction:

The prices of ginger in the study area were discussed in this study in relation to the producers of the crop, the rural middlemen, the rural assemblers, and the urban wholesalers who sold to foreign exporters at seaports, and to some processing industries. Prices of the crop under these group were again examined and discussed in relation to their variation over time and at various seasons within the years.

5.9.2 Producer Prices of Ginger:

Producer prices of ginger were collected and examined within four main seasons of the year: November to January ("season of harvest), February to April ("season of processing and abundant sale"), May to July ("season of demand"), and August to October ("season of scarcity").

The average price per / tonne of ginger in 1987 was ₦2,072. It increased by 8.4% to ₦2,246 in 1988. There was another increased of 22.4% in 1989 to an average price of ₦2,748.00 per tonne. In 1990, the price of the crop dropped by 2.6% to ₦2,676.00, while there was a rise in average price of 1991 by 11.3% - making a tonne to cost ₦2,978.00 (see Table 5.13).

TABLE 5.13: PRODUCERS' PRICE OF DRIED SPLIT GINGER PER TONNE

SEASONS	1987 ₦	1988 ₦	1989 ₦	1990 ₦	1991 ₦
November-January	1,558.00	1,588.00	1,844.00	1,960.00	2,350.00
February - April	1,832.00	1,854.00	2,258.00	2,610.00	2,502.00
May - July	2,240.00	2,624.00	3,378.00	2,774.00	3,272.00
August - October	2,650.00	2,916.00	3,512.00	3,362.00	3,254.00
TOTAL	8,280.00	8,982.00	10,992.00	10,706.00	11,914.00
AVERAGE	2,070.00	2,246.00	2,748.00	2,676.00	2,978.00

SOURCE: Field Work, 1992

There were as much variations within prices for each year as they were between the various years. For instance, in all the years (except 1991), prices of the crop kept increasing from the beginning of harvest in November till the time of scarcity in early October. Each year had its price patterns slightly different from that of the other years. There existed some high differences between the prices of the crop at the "season of harvest (November to January) and "season of scarcity" (August to October For example, the difference between prices of the two seasons was (on the average) ₦1,092.00 in 1987, ₦1,328.00 in 1988 and ₦1,668.00 in 1989. In 1990, it was ₦1,400.00, while 1991 was ₦900.00. There were so probably because of the fact that producers did not sell their produce at the same time, even though most of the produce were sold within six months of harvest (Table 5.8). On leaving the farmers' hands, the produce passed through a chain of hands. The handlers of this produce and the prices involved are discussed below.

5.10 INTERMEDIARIES IN THE MARKETING OF GINGER

The marketing intermediaries of ginger are the various functionaries (middlemen) involved in the buying and selling of the crop as it moves from the producers to the exporters and/or consumers. These intermediaries perform the function of buying, storage, assembling, transporting and selling of the crop. Attempt is made here to briefly describe each group of intermediary and its function at the various levels of marketing process, and the prices of ginger at each level.

5.10.1 Rural Middlemen:

The rural middleman is a resident of the village or nearby village who buys ginger from the producers either in the farm, at home, on the way to the market or in the local markets, and sell to rural assemblers, urban based wholesalers selling at seaports or both. The rural middlemen buy ginger in bits (small containers) and gather them in sacks (see Fig. 10).

A sack of dried split ginger (on the average) weighs 50kg. The commonest of the small containers that the producers used for selling their produce were the small baskets, and household bowls, the big basins called "Kwano kaya", and empty bags of chemical fertilizers. Through haggling the middlemen bought the bits (ginger in small containers) from the producers. There was no standard price for the "bits" of ginger taken to the market by the producers.

The rural middlemen went to the markets very early in the morning to confirm market prices from rural assemblers. Some of them quickly moved to the market fringes or producers' houses to intercept ginger from the producers on their way to the market. Few producers managed to take their produce to the market place before selling it out. By the time the farmers realised the actual price for the particular market day, they had sold out

FIGURE 10: A SACK OF GINGER READY FOR SALE BY A RURAL MIDDLEMAN.

SOURCE: FIELD SURVEY, 1992

their crop to the middlemen at a lower price.

The implication of this type of marketing is that most of the prices Marketing Boards collected from the markets were those of rural middlemen and rural assemblers and not farmers as the farmers sold their produce below market prices.

Figures from the present study indicate that all the 68 (100%) middlemen interviewed were male. The researcher was not able to find a female among rural middlemen of ginger trade.

The ages of those involved in rural middlemanship of ginger was mostly between 30 and 50 (83.8% of the respondents). While only 8.8% were below the ages of 30, 7 .4% were between 50 and 60 years. The marital status of the rural middlemen indicated that 63 (92.6%) of the 68 men were married, while 5 (7.4%) were single.

Educationally, 47.1% (32 of the 68 middlemen) obtained adult education only, while 20.5% received some primary education. Only 14.7% received full primary education. Those that received some secondary education and full secondary education were 7.4% and 10.3% respectively.

The main occupation of 83.8% of the rural middlemen was farming. About 14.7% claimed that trading was their main occupation. Only 1.5% of the rural middlemen interviewed had civil service as their main occupation. Of the 10 (14.7%) who took trading as their main occupation, all of them took to farming as their secondary occupation.

The frequency with which 40 (58.8%) out of the 68 respondents visited the market was weekly, while 41.2% said they went to the market from time to time. However, some of the traders visited two to four markets within the study area in a week. Also, while 66.2% of the middlemen said they patronised the ginger markets at all seasons, 33.8% visited the markets during dry season only.

Answers to the question of where the middlemen bought their ginger, 4.4% said they bought in producers' houses only, and 12 (17.7%) bought from the market only. While 50 (73.5%) bought ginger from both the producers' houses and the local markets, 44.4% in addition to these places, the producers' farms. These middlemen did not buy from specific people. Some 86.8% of them were with the opinion that the ginger they bought in producers' houses was cheaper than those from other sources, while 4.4% felt it was those they bought from the farms that were cheaper. While 2.9% thought wherever ginger was bought it cost the same, 5.9% thought ginger bought in the market was cheaper.

On the average, each middleman bought 3.3 bags of ginger per market day. Out of the 68 middlemen interviewed, 61 (89.7%) claimed they bought just this amount because that was all the money they had could buy. Five (7.4%) middlemen said they could not transport more than that amount. The 2.2% that said that was all they could buy from the markets were from the smaller inaccessible markets of Nok and Kurmin-Musa. A large percentage (67.6%) of the ginger bought by middlemen was sold in the markets to other buyers. About 32.4% of what they bought was moved to other rural markets.

Most of the middlemen in the area (88.2%) did not trade in other crops. Only 8 (11.8%) traded in other crops. Out of these 8 (11.8%), 4 (5.9%) of 68 traded in groundnuts in addition to ginger, 2 (2.95%) traded in maize, while one each (1.48%) traded in guinea corn/millet and acha respectively. While 62.5% (5) of the 8 said they found the other crops cheaper, 3 (37.5%) simply said that these crops were just other articles of trade.

Table 5.14 indicates the average cost of buying and handling a bag of ginger by the middlemen.

TABLE 5.14: AVERAGE COST OF BUYING AND HANDLING A TONNE OF GINGER BY MIDDLEMEN (1987 - 1991)

SEASONS	1987 ₦	1988 ₦	1989 ₦	1990 ₦	1991 ₦
November-January	1,900.00	2,166.00	2,564.00	2,450.00	2,876.00
February - April	2,096.00	2,100.00	3,362.00	2,868.00	3,176.00
May - July	2,860.00	2,870.00	3,676.00	3,230.00	3,244.00
August - October	3,150.00	3,288.00	4,458.00	3,370.00	3,650.00
TOTAL	10,006.00	10,424.00	14,060.00	11,918.00	12,946.00
AVERAGE	2,502.00	2,606.00	3,516.00	2,980.00	3,236.00

SOURCE: Field Work, 1992

Table 5.14 indicates how prices of buying and handling a tonne of ginger by the middlemen changed within the same time (season) over the five years. The changed pattern of prices within each season of the five years shows that they kept increasing, slightly dropping only in 1990. Also, the prices kept increasing in each of the years from the season of harvest in November till the season of scarcity between August and October. The average cost of buying and handling a tonne of ginger by the middlemen in 1987 was ₦2,502 and ₦2,606 in 1988. This further increased to ₦3,516 in 1989 only to drop to ₦2,980 in 1990 and increased to ₦3,236 in 1991.

TABLE 5.15: AVERAGE SELLING PRICE PER TONNE OF GINGER BY RURAL MIDDLEMEN (1987 - 1991)

SEASONS	1987 ₦	1988 ₦	1989 ₦	1990 ₦	1991 ₦
November-January	2,644.00	2,822.00	3,216.00	2,840.00	3,020.00
February - April	2,802.00	2,984.00	3,776.00	3,002.00	3,412.00
May - July	2,986.00	3,062.00	3,908.00	3,442.00	3,708.00
August - October	3,024.00	3,214.00	4,910.00	3,986.00	4.090.00
TOTAL	11,456.00	12,082.00	15,810.00	13,270.00	14,230.00
AVERAGE	2,864.00	3,020.00	3,952.00	3,318.00	3,558.00

SOURCE: Field Work, 1992

Figures in Table 5.15 compared to those of Table 5.14 indicate that rural middlemen made considerable profit from the trade of ginger. For instance, an average profit realised from a tonne of ginger in 1991 was ₦321.00. In 1990, the average gain on a tonne of ginger by rural middlemen was ₦338.00, while in 1989 the average gain was a little more than that by ₦100.00. Middlemen gained ₦414.00 per tonne of ginger in 1988, and claimed they gained ₦52.00 less than that amount in 1987.

The figures of the various seasons also indicate that the middlemen made sizeable profits at various seasons except in season of scarcity (August to October) of 1987 and 1988 when they sold at an average loss of ₦126.00 and ₦74.00 per tonne respectively.

Figures of Table 5.16 indicate that there is no consistency in the interests realised from the sale of ginger by the middlemen.

TABLE 5.16: MIDDLEMEN'S AVERAGE GAIN PER TONNE OF GINGER (1987 - 1991)

SEASONS	1987 ₦	1988 ₦	1989 ₦	1990 ₦	1991 ₦
November–January	744.00	656.00	652.00	390.00	144.00
February - April	706.00	884.00	414.00	134.00	236.00
May - July	126.00	192.00	232.00	212.00	464.00
August - October	-126.00	-74.00	452.00	616.00	440.00
TOTAL	1,450.00	1,658.00	1,750.00	1,352.00	1,284.00
AVERAGE	362.00	414.00	438.00	338.00	321.00

SOURCE: Field Work, 1992

Over the years, 1987 to 1991, the average profit per tonne of ginger made by rural middlemen in the study area ranged between ₦321.00 (1991) and ₦438.00 (1989). Again, going by averages over these years, middlemen made more profit during the season of harvest than at any other season.

When the middlemen were asked to explain why they thought the farmers sold to them, 48 (70.6%) stated that it was because they offered better prices to the farmers. Out of the 68 middlemen, 6 (8.8%) said that the farmers could not transport the produce to the market. While 2 (3.0%) of them said that the farmers needed money before market days, 12 (17.6%) refused to give any reason on that. All the rural middlemen (100%) denied being agents for urban-based wholesalers or exporters. Out of the 68 middlemen, 51 (75%) 'fearfully' said they had no licences as buying agents, while 25% said they had licences which cost between ₦20 and ₦50.

All the middlemen sold ginger in the form of dried split. Apart from the local uses of ginger for flavouring soup and porridge, and sometimes as medicine, 51 (75%) of the middlemen said they did not know any other use of ginger. Fifteen of them (22%) said ginger was used for the manufacturing of sweets, peper-mints and drinks, while 2 (3%) said it was used for the manufacturing of some medicine.

5.10.2 Rural Assemblers:

5.10.2.1 Their Characteristics and Mode of Operation

The rural assembler is an individual residing in either a rural or urban area who moves around the rural areas purchasing ginger or other crops from rural middlemen or directly from producers at rural markets. After purchasing the crops, he hires a light van or light truck to transport the crops to wherever he likes (see Figure 11).

The rural assembler holds title to the crop and may sell it outrightly to a wholesaler in an urban area, or he may store till when the prices have gone up then he will bring it out for sale to the urban based wholesaler.

The rural assembler purchased mostly in sacks (bags), though he some-

FIGURE 11: A LIGHT TRACK IN A GINGER MARKET FOR TRANSPORTING THE ASSEMBLED SACKS.

SOURCE: FIELD SURVEY, 1992.

times buy in small quantities when he found it cheaper to do so. According to Field Survey carried out for this study, rural assemblers bought from less than 50kg. to as much as 2.5 tonnes at a time. The rural assembler was one of the best sources of information about ginger prices in the area. He had the capital, possessed considerable entrepreneural ability and was exposed to considerable risk and uncertainty. He purchased dried split ginger, which was easy to store, and sold it when he found it was possible to make a large profit (see Figure 12).

Thirty of these rural assemblers were interviewed. Out of these, 28 (93.3%) were males, and 2 (6.7%) females. Also, out of these, 17 (56.7%) were between the ages of 41 and 50, while 11 (36.6%) were between the ages of 31 and 40. Only 2 (6.7%) were above 51 years of age. Again, only 3.3% were widows, while all the rest were married.

Their educational background showed that 12 (40%) had only adult education, 7 (23.3%) had some primary school education and 5 (16%) had full primary education. While 4 (13.4%) had post-secondary education, only one (3.3%) had full secondary school education and another one some secondary education only.

The main occupation of 13 (43.3%) rural assemblers was farming, 11 (36.7%) was trading and 6 (20%) was civil service job. All the 6 civil servants and 13 farmers took to trading as their secondary occupation. Only one of them had tailoring as his secondary occupation.

Most of the rural assemblers visited the rural markets weekly (70%), some others did their purchase from time to time (30% of respondents). Also, majority of them made their purchases directly in the rural markets (73.3%), while 26.7% bought both in the markets, in middlemen's houses and in producers' houses. They did not buy from specific people.

As to where they bought cheaper ginger, 66.6% claimed it was in the rural markets. About 20% of the respondents felt it was cheaper when bought in producers' houses. Only 6.7% said they bought it cheaper in middlemen's houses.

The amount of tonnes bought by the rural assemblers per each market day ranged between 0.5 and 2.75 with an average of 1.53 tonnes. Majority of the rural assemblers interviewed (70%) claimed they bought just the said amount because that was all the money they had could command, while 20% said that was all that was available in the markets. Only 10% said they could transport more than the quantity they bought. While 46.6% of the assemblers took what they purchased to store houses and sold at the latter times, 36.7% sold in the market to urban based buyers (wholesalers - who shift the crop to seaports). Those who took what they bought to other rural markets were 16.7%.

The figures in Table 5.17 give a summary of the ginger purchased by rural assemblers in the study area per market day. It indicated that the highest purchase of ginger by rural assemblers was obtained in Kwoi market, followed by Walijo, Kachia, Daddu, Kubacha, Ghori, Kudah, Kurmin Musa and Nok, in that order.

A few of the rural assemblers (23.7%) bought other crops from the study area. Out of the 7 (23.7%) respondents that bought other crops , 3 (10%) bought maize, 2 (6.7%) purchased guinea corn and millet, 1 (3.3%) each bought acha and groundnut respectively.

TABLE 5.17: AMOUNT OF GINGER PURCHASED BY RURAL ASSEMBLERS (IN TONNES) EACH MARKET DAY

TONNES	KACHIA	WALIJO	KUDAH	KUBACHA	K/MUSA	KWOI	DADDU	CHORI	NOK
Total	7.75	8.5	5.1	7.5	2.25	9.5	7.65	5.5	2.15
Average	1.9	2.125	1.7	1.875	1.125	2.375	1.915	1.835	1.075

SOURCE: Field Work, 1992

5.10.2.2 <u>Rural Assemblers' Cost of Operations:</u>

The average cost of purchasing and handling a tonne of ginger by the rural assemblers between 1987 and 1991 has been summarised in Table 5.18. The figures show that the average price of buying and handling a tonne of ginger increased progressively from the season of harvest in November till the season of scarcity around August and October. Also, there has been a yearly increased in the prices up to 1989. There was a decline in the average price per tonne of ginger in 1990.

TABLE 5.18: RURAL ASSEMBLERS' COST OF PURCHASING AND HANDLING A TONNE OF GINGER (1987 - 1991)

SEASONS	1987 ₦	1988 ₦	1989 ₦	1990 ₦	1991 ₦
November—January	2,580.00	2,654.00	2,974.00	2,634.00	2,994.00
February - April	2,600.00	2,734.00	3,660.00	3,380.00	3,474.00
May - July	2,914.00	3,114.00	4,414.00	3,660.00	3,866.00
August - October	3,174.00	3,566.00	4,860.00	4,446.00	3,986.00
TOTAL	11,268.00	12,068.00	15,908.00	14,200.00	14,320.00
AVERAGE	2,817.00	3,017.00	3,977.00	3,550.00	3,580.00

SOURCE: Field Work, 1992

The yearly average cost of purchase and handling of a tonne of ginger by rural assemblers between 1987 and 1991 ranged between ₦2,817.00 (1987) and ₦3,977.00 (1989). In between these were 1988, 1990 and 1991 with ₦3,017.00, ₦3,550.00 and ₦3,580.00 respectively.

The average cost of selling a tonne of ginger by rural assemblers ranged between ₦3,104.00 (1987) and ₦4,547.00 in 1989). The pattern of sale was very much similar to that of purchase and handling.

AVERAGE COST O
GINGER BY ASSI

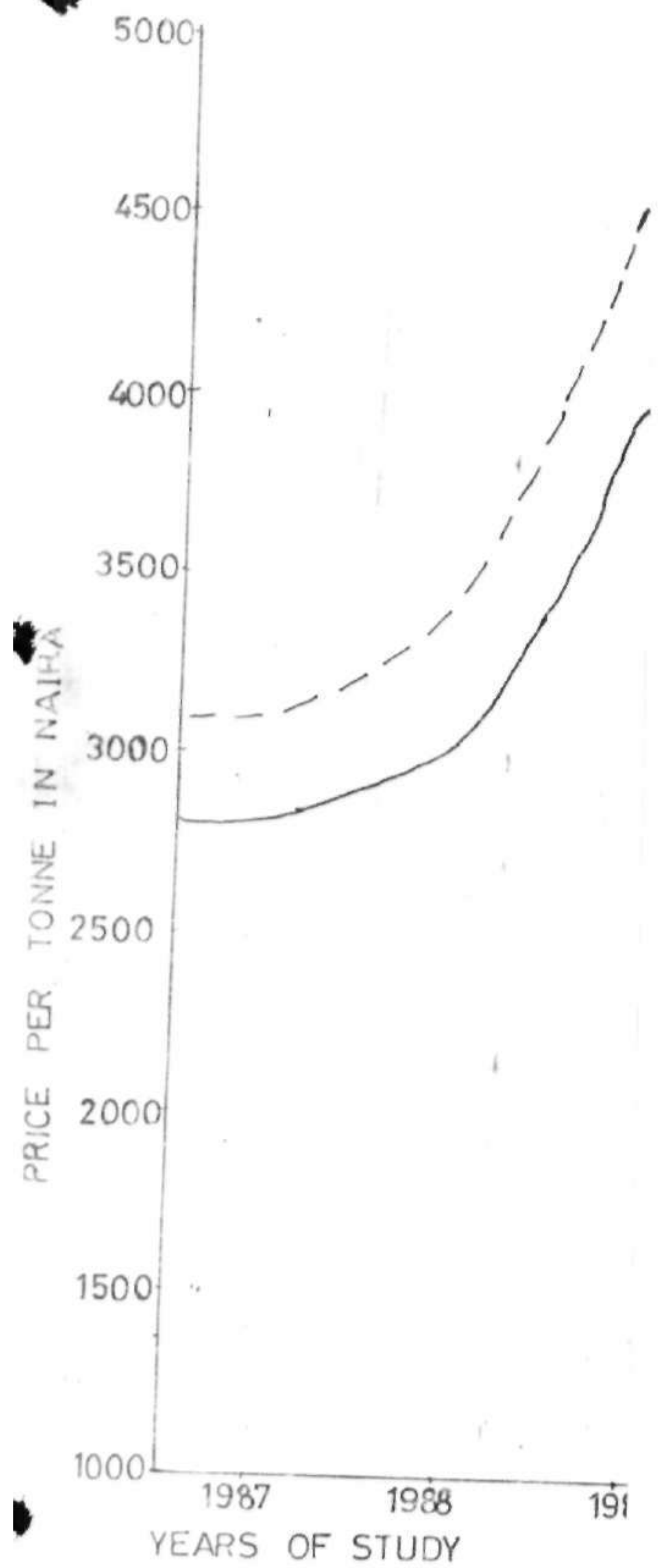


TABLE 5.19: AVERAGE COST OF SELLING A TONNE OF GINGER BY RURAL ASSEMBLERS (1987 - 1991)

SEASONS	1987 ₦	1988 ₦	1989 ₦	1990 ₦	1991 ₦
November-January	2,726.00	3,194.00	3,394.00	3,060.00	3,226.00
February - April	2,774.00	3,220.00	4,094.00	3,740.00	3,980.00
May - July	3,274.00	3,314.00	4,686.00	4,300.00	4,314.00
August - October	3,640.00	4,014.00	6,014.00	5,020.00	5,006.00
TOTAL	12,414.00	13,742.00	18,188.00	16,120.00	16,526.00
AVERAGE	3,104.00	3,436.00	4,547.00	4,030.00	4,132.00

SOURCE: Field Work, 1992

Table 5.20 gives us figures of the average profit per tonne of ginger by rural assemblers.

TABLE 5.20: RURAL ASSEMBLERS/AVERAGE PROFIT PER TONNE OF GINGER (1987 - 1991)

SEASONS	1987 ₦	1988 ₦	1989 ₦	1990 ₦	1991 ₦
November-January	146.00	540.00	420.00	426.00	232.00
February-April	174.00	486.00	494.00	360.00	506.00
May - July	360.00	200.00	272.00	560.00	448.00
August - October	466.00	448.00	1,154.00	574.00	1,020.00
TOTAL	1,146.00	1,674.00	2,340.00	1,920.00	2,206.00
AVERAGE	286.00	418.00	585.00	480.00	552.00

SOURCE: Field Work, 1992

The rural assemblers, according to the figures in Table 5.20, made an average profit of ₦286.00 in 1987, ₦418.00 in 1988, and ₦585.00 in 1989 per tonne of ginger. In 1990 and 1991, the average profits per tonne of ginger were ₦480 and ₦552 respectively. There was fluctuation of profit between the years and within each of the years. However, they tended to make more gains per tonne during the season of scarcity (August to October), except in 1988 when they realised more profit during harvest season of November to January.

According to 76.7% (23 out of 30) of the rural assemblers interviewed for this study, the middlemen sold the ginger they bought to them because they offered better prices to the middlemen. However, 4 (13.3%) others felt that the middlemen sold to them (the rural assemblers) because the middlemen could not transport their ginger beyond the local markets. While one (3.3%) thought that rural middlemen sold to the assemblers because they needed money for other purchases, the remaining 2 (6.7%) gave no reason at all.

None of the rural assemblers agreed to being an agent of urban wholesalers or some urban firms. However, they all claimed to have licences that permitted them to trade in ginger, which cost them between ₦50.00 and ₦200.00 yearly. Fifty (50) percent of the respondents claimed it cost them ₦100.00 yearly, while 10 (33.3%) said it cost them ₦150.00. Only one (3.3%) said it cost them ₦200.00, while the remaining 4 (13.4%) bought their licences at ₦50.00 each year.

While 5 (16.7%) of the rural assemblers claimed that they did not know the uses to which ginger is put, 21 (70%) said it was used for the making of some sweets and pepper-mints. Only 4 (13.3%) said simply that ginger was used for processing of foods and drinks.

5.10.3 Urban-Based Wholesalers:

The urban-based wholesalers are residents of urban areas but who handled bulk quantities of ginger which they 'export' outside the producing region

FIGURE 11: SACKS OF GINGER FOR STORAGE BY RURAL ASSEMBLER.

SOURCE: FIELD SURVEY, 1992

to the ports for final shipment abroad. The urban wholesalers performed the normal marketing functions of buying and storing, and had title to the crop. Although the producers and other groups of middlemen thought that urban-based wholesalers determined the price of ginger in the study area, all the urban-based wholesalers said that ginger prices were determined by foreign buyers and exporters of the crop. An example was given of 1989 where many foreign exporters came and the price rose up considerably.

All the seven urban-based wholesalers interviewed happened to be males. Out of this number, 2 (28.6%) said they resided in Kaduna, one (14.3%) resided in Kafanchan, while 2 (28.6%) were based in Kano. Others were one (14.3%) each from Port-Harcourt and Lagos/Ibadan area respectively. These business men had been on the ginger business between 6 and 10 years.

Although the urban based wholesalers claimed that they had agents in the rural markets ranging between 9 and 15 working for them, none of the rural assemblers or rural middlemen interviewed claimed to be working for these wholesalers. They claimed they paid their workers between ₦300.00 and ₦1,000.00 monthly, with an average of ₦685.70 monthly.

About 71% of the urban-based wholesalers got their supply from the rural assemblers, while the other 29% got their supply from both the rural middlemen and the rural assemblers. Urban wholesalers got money for this business either from personal savings (28.6%), friends (28.6%) or relations (14.3%). Only 28.6% got the money from bank loans.

TABLE 5.21: AVERAGE COST OF PURCHASING A TONNE OF GINGER BY URBAN WHOLESALER (1987 - 1991)

SEASONS	1987 ₦	1988 ₦	1989 ₦	1990 ₦	1991 ₦
November-January	4,286.00	4,428.00	5,000.00	4,428.00	4,714.00
February - April	4,286.00	4,286.00	6,714.00	4,700.00	4,856.00
May - July	4,570.00	5,000.00	6,714.00	6,284.00	6,420.00
August - October	5,428.00	5,714.00	7,428.00	6,856.00	6,856.00
TOTAL	18,570.00	19,428.00	25,856.00	22,268.00	22,846.00
AVERAGE	4,642.00	4,857.00	6.464.00	5,567.00	5,712.00

SOURCE: Field Work, 1992

According to the figures in Table 5.21, the average yearly cost of purchasing a tonne of ginger by the urban based wholesalers over the period of time under study (1987 - 1991) ranged between ₦4,642.00 in (1987 and ₦6,464.00 (1989).

The figures of Table 5.20 show some wide variation from those of Table 5.18 (average cost of selling price by rural assemblers) in the following yearly order: ₦1,538.00 in 1987, ₦1,422.00 in 1988, ₦1,916.00 in 1989, ₦1,538.00 in 1990 and ₦1,580.00 in 1991. This indicates that one of the two groups of intermediaries probably did not give its figures correctly. It could either be that rural assemblers did not give their correct selling figures or the urban wholesalers, over estimated theirs.

According to the urban wholesalers, it cost them a lot in transporting the crop to seaports. Table 5.22 has the figures.

TABLE 5.22: AVERAGE COST OF TRANSPORTING A LOAD (10,000 TONNES) OF GINGER TO SEAPORTS (1987 - 1991)

amount (X)	1987 (Y_1)	XY_1	1988 (Y_2)	XY_2	1989 (Y_3)	XY_3	1990 (Y_4)	XY_4	1991 (Y_5)	XY_5
₦2,000	5	10,000	1	2,000	-	-	-	-	-	-
₦2,500	1	2,500	5	12,500	5	12,500	5	12,500	1	2,500
₦3,000	1	3,000	1	6,000	2	6,500	2	6,500	6	18,000
Total (₦)	7	15,500	7	17,500	7	18,500	7	18,500	7	20,500
Average (₦)		2,214.2		2,500.0		2,642.6		2,642.6		2,928.5
Cost of Transporting One Tonne		222.00.		250.00		264.00		264.00		292.00

SOURCE: Field Work, 1992

Y = Number of Respondents

X = Cost of Transporting a Lorry Load

The average cost of transporting a load of ginger to the seaports ranged between ₦2,200.00 and ₦2,928.50. That means, each of the 200 sacks (10 tonnes) that made a lorry load cost between ₦11.00 or ₦222.00 / tonne (1987) and ₦14.60 or ₦292.00 / tonne (1991) with an average of ₦12.92 per sack or ₦258.40 / tonne. The figures show that cost of transportation increased every year except in 1990 when there was no increase over 1989 rate. While 6 (85.7%) of the wholesalers sold all the crops at the seaports, one (14.3%) said he also sold to other processing industries in Nigeria.

TABLE 5.23: AVERAGE COST OF SELLING A LORRY LOAD (10 TONNES) OF GINGER (1987 - 1991)

SEASONS	1987 ₦	1988 ₦	1989 ₦	1990 ₦	1991 ₦
November-January	82,857.0	86,428.5	93,571.0	91,428.5	92,142.8
February - April	82,857.0	86,428.5	93,571.0	93,571.0	93,571.0
May - July	87,142.0	90,714.0	93,571.0	93,571.0	93,571.0
August - October	90,714.0	91,428.5	93,571.0	93,571.0	93,571.0
TOTAL	343,570.0	354,999.5	374,284.0	372,141.0	372,855.0
AVERAGE	85,892.5	88,749.9	93,571.0	93,035.4	93,213.9
COST OF 1 TONNE	8,590.0	8,874.0	9,358.0	9,304.0	9,322.0

SOURCE: Field Work, 1992

N.B.: A lorry load of ginger contained 200 sacks on the average (10,000 kg.)

There seems to be very little variation in the cost of selling ginger by urban wholesalers either between seasons within each of the years or between the various year, 1987 to 1991. When costs of purchase handling and transportation are deducted from the selling price, the remainder represents profit to the urban wholesaler shown in Table 5.24.

FIGURE 13: A TRAILER LOAD OF GINGER READY FOR MOVEMENT TO THE SEAPORT BY URBAN WHOLESALER.

SOURCE: FIELD SURVEY, 1992

TABLE 5.24: URBAN WHOLESALERS' AVERAGE PROFIT PER TONNE OF GINGER (1987 - 1991)

	1987 ₦	1988 ₦	1989 ₦	1990 ₦	1991 ₦
Total Sale Cost	8,590.00	8,874.00	9,358.00	9,304.00	9,322.00
Total Purchase Cost	4,844.00	5,108.00	6,728.00	5,832.00	6,004.00
Total Transport Cost	222.00	250.00	224.00	264.00	292.00
PROFIT	3,524.00	3,516.00	2,406.00	3,208.00	3,026.00

SOURCE: Field Work, 1992

According to the figures obtained from the survey for this study, the urban wholesalers visited an average of 4 market days per week. And, in each of the markets they made an average purchase of one lorry load (200 sacks) or 10 tonnes per market day. They therefore visited an average of 192 market days a year. Since one lorry load was 200 sacks or ten tonnes (on the average), each of them purchased 192 x 200 sacks = 38,400 sacks or 1,920 tonnes in a year.

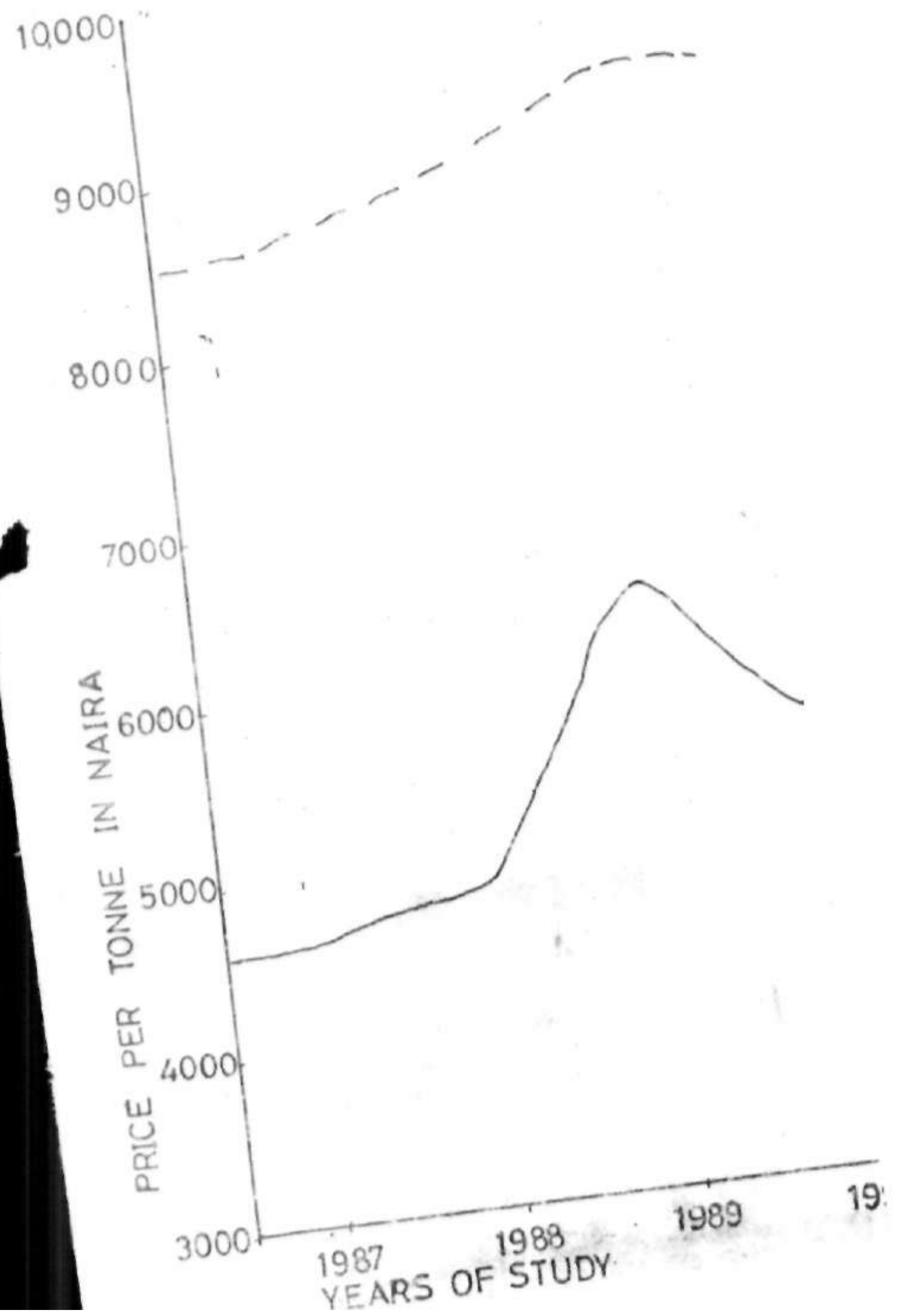
The average transport cost per tonne of ginger was ₦258.40. The total cost for the year was therefore ₦258.40 x 1,920 tonnes = ₦496,128.00.

If the wholesaler paid an average of 12 agents a salary of ₦685.70 a month as figures of this study showed, that will amount to ₦685.70 x 12 = ₦8,228.40. For the 12 months of the year = ₦8,228.40 x 12 = ₦98,740.80.

The average gain per tonne over the five years period was ₦3,382.00. Multiply it by the number of tonnes purchased ((1,920 x ₦3,382.00) and it gives us ₦6,493,440.00. If we subtract ₦98,740.80 and ₦496,128.00 from these figures (₦6,493,440.00 - ₦98,740.80 + ₦496,128.00) it will give us ₦5,799,830.40 as profit per year.

All the urban wholesalers thought that ginger was not imported from other countries into Nigeria. They considered that ginger might be

AVERAGE COST OF BUYI
PER TONNE BY URBAN



imported as processed foods or drinks and not raw. They listed other users of ginger as breweries, baking and food processing companies, spice industries, and sweets and pepper-mints industries. Only 28.6% of the wholesalers did not know the uses of ginger.

5.11 AVERAGE NET REVENUE ESTIMATES FROM GINGER PRODUCTION

To obtain revenue estimates of ginger production, all operational activities of the chosen land area (1 hectarc) were costed, the total amount of ginger produced on such a land (1 hectare) obtained and worked out (costed). The total cost of input was deducted from the total cost of output. The figures obtained from this deduction gave us the farmers' net revenue. Since the majority of farmers in the area of study did not use tractors, the cost of manual ploughing as against that of tractors, and hand-weeding as against the use of herbicides were employed. See Table 5.25.

TABLE 5.25: AVERAGE COST OF GINGER PRODUCTION ON A HECTARE FARM PLOT

FARM OPERATIONS	AVERAGE COST/HECTARE ₦
Land Clearing	252.00
Ploughing	1,240.00
Harrowing	842.40
Cutting of Grass	1,632.00
Purchase of Seeds	2,192.00
Transportation of Seeds and Grass to Farm	453.60
Sowing of Ginger	640.00
Mulching	208.00
Manuring	200.00
Weeding	910.40
Harvest (Digging)	1,084.00
Transportation of Produce Home	733.60
Fertilizers (3.3 Bags at Government Price)	1,320.00

Cost of Transportation to the Market	32.80
Cost of Labour to Split 9.8 Sacks (Total Produce)	1,215.20
TOTAL	12,956.00

SOURCE: Field Work, 1992

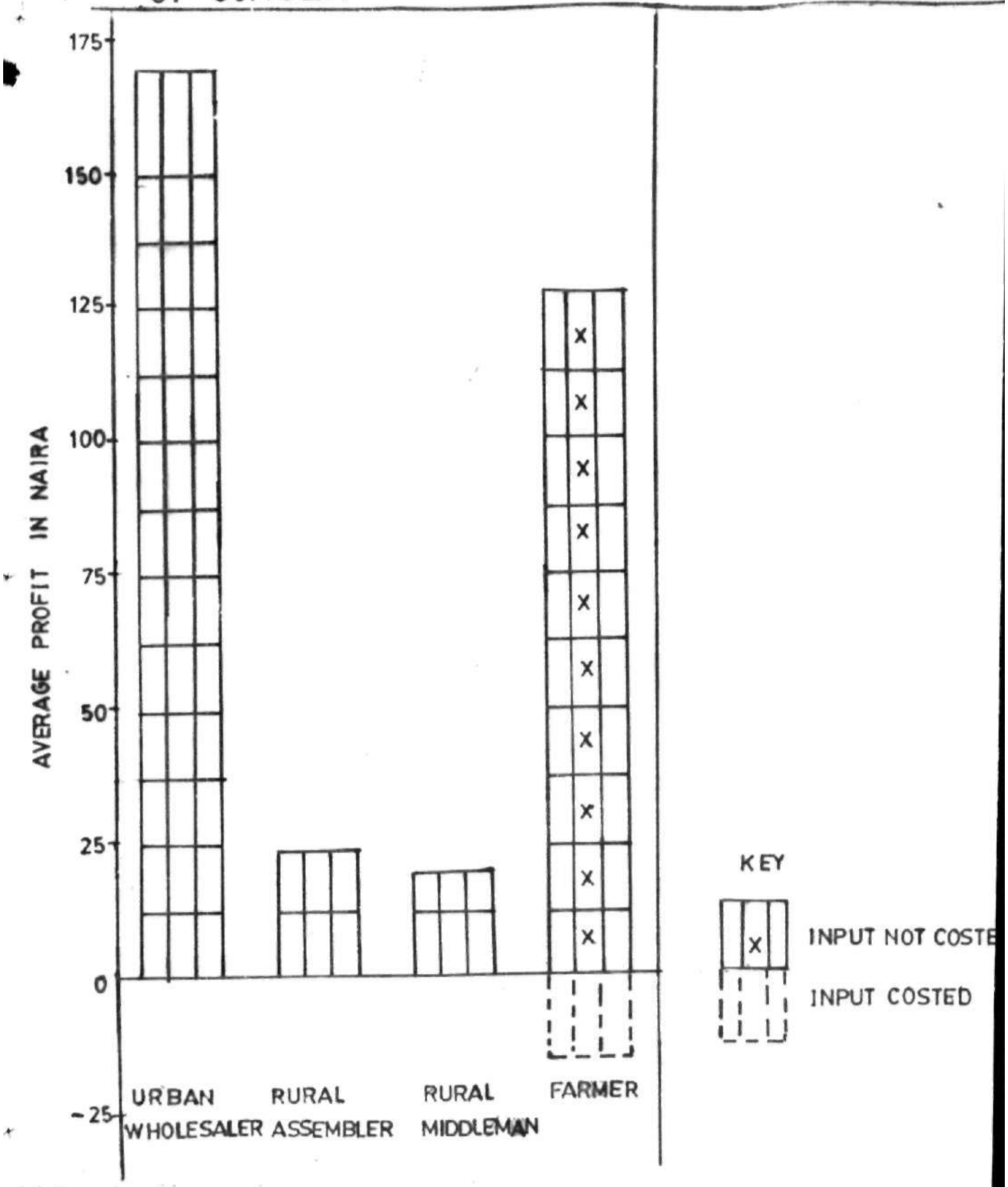
NOTE: The average price for 1 tonne of ginger on current (Table 5.13) producer's price is ₦2,978.00. Therefore 3.92 tonnes x ₦2,978.00 = ₦11,673.60; Net Revenue = ₦11,673.60 - ₦12,956.00 = -₦1,282.40.

What these figures imply is that, when farming operations were costed, the farmers were operating at a loss of ₦1,283.00 per hectare, making us to accept the null hypothesis that says ginger production has made no difference to the income of the producers.

However, most of the farming operations were done by the farmer himself and/or with the help of members of his family. For instance, out of the 210 farmers interviewed, 169 (80.5%) did the land clearing by themselves, 149 (70.5%) did their ploughing without hiring anybody to assist, 180 (85.7%) did their own harrowing, while 133 (63.3%) cut grasses by themselves. Again, 173 (82.4%) did not buy ginger seeds, 204 (97.0%) transported grasses and seeds to the farm on their own, while 94.3% and 97.6% did their sowing and mulching respectively. Other farm operations followed almost the same pattern, with a greater number of people doing the work themselves.

In this case therefore, we may have to reject the null hypothesis, and come to conclusion that ginger production has made some difference in the income of their economy. Again, we reject the null hypothesis because some of the ginger growing operations were done at certain times when the producers did not have much farm work to do. For instance, cutting of grass in the dry season; ploughing of land at the end of rains when other

FIG. 14 AVERAGE PROFIT PER SACK OF 50KG WEIGHT OF GINGER



farm works have largely been completed; digging and processing at the time other harvests have partly been completed, and some of the farmers engaging in ginger trade during the dry season (secondary occupation). This means that the opportunity costs of some of the operations is zero.

In view of the above arrangement, the second part of the hypothesis which states that ginger production does not affect the production of other crops may have to be accepted. For, apart from the above arguement, harrowing, sowing and mulching of ginger were done during the first rains - times of uncertainty of rainfall. Since the farmer could not risk planting seeds of other crops for fear of rain discontinuity, ginger seeds which can stay much longer in the ground without rain, were planted, and the beds mulched. The only other operation that coincided greatly with that of other crops was weeding. That again explains why 36.7% of the producers engaged hired labour at such operation.

Moreover, one may argue that part of the land which could be used for growing other crops was being used for growing ginger thus interferring with other crops production. But, ginger production on the other hand helps in expansion of land-holdings through the cultivation of hard lands settled (occupied) by cattle Fulani. Once the land ("mashekari") has been ploughed and used for growing ginger, it becomes soft enough for other farming activities to be carried out there.

Ginger was also grown on farmlands that pests and rodents attack other crops. This made such farmlands to be of good use instead of being left to be of no use. And to crown it all, ginger farmlands were made more fertile through high chemical fertilizers, refuse dump and farm yard manure applications. The mulching grasses and leaves decomposed and further enriched the soil's nutrients with organic matter for the benefit of the crop and other crops.

CHAPTER VI

6.1 DISCUSSIONS

This study has primarily attempted to examine the role of ginger production in the rural economy. The present economic depression together with various measures adopted by the government to put the ailing Nigerian economy on a sound footing has resulted in the general increase in both production and prices of agricultural commodities in the country. While certain cash crops have been given significant consideration in price increase by the government, ginger has not receive such attention. Although there has been some considerable increase in the marketing price of ginger in the open market, a great percentage of this increase has not been at the producers' level.

This has therefore prompted concern about the performance of the crop's production in the economy of the rural producer in particular, and the country in general. Whether ginger production has been promoting the optimal allocation of resources through reflection of recent increase in production and price structure back to the producer thus facilitating the improvement in the rural economy is a contention that has been considered.

The central question of investigation in this study was on the extent to which recent increase in the quantity of ginger produced and price offered has led to increase in farmers' income thus general improvement in the rural economy. The complexity of this question has necessitated the limitation of investigation to gathering and analysis of costs of inputs and outputs of the crop as well as the conduct and performance of the market structure. These provided guidelines on the effectiveness of increased production and price system in giving expression to the performances of the crop's production as an aspect of resource allocator to the rural economy.

6.2 GINGER PRODUCTION

Ginger production in the study area required high labour input. Every aspect of the production demanded a lot of labour and money. From land clearing, ploughing and harrowing, planting and mulching, weeding, digging to processing of the crop for marketing, the farmer was seen very busy. Production process used to start in late October with ploughing of the selected fertile land. This was immediately followed by cutting of grasses for mulching. Harrowing, planting, mulching and manuring were done during the early rains in March or April. Weeding was done four to six weeks later through picking of weeds by hand. Weeding was done three to four times before harvest. Harvesting was done through digging of the crop with a hoe. The harvested rhizomes were transported to the farmers' houses mostly through head portage. The processing of the crop for sale involved splitting the rhizome and drying it in an open sun for about four days. All these processes were well spread throughout the year, with only weeding time significantly coinciding with the time for production of other crops.

6.2.1 Ginger Production Problems:

Farmers in the study area were faced with several production problems among which were: insufficient and inadequate supply of fertilizers by the government, and lack of capital to procure the fertilizers available. Even those fertilizers available were too expensive for the farmers to easily afford. Also, the farmers could not afford to purchase modern farming tools like tractors and herbicides. Banks offered loans with high interest which further discouraged the farmers from taking bank loans, as they had to pay back after harvest.

Seed storage was identified as another production problem of the crop.

Storage of seeds was a delicate aspect in ginger production. If the seeds were left in the ground the cattle Fulani grazed on them which caused a lot of damage to the crop. If they were dug and stored at home, they either dried up or got rotten. Chemicals that could help to preserve the crop for seeds were not yet known to the farmers. Although farmers tried to store in cool places, the problem still remained.

6.3 PERFORMANCE OF GINGER PRODUCTION IN RELATION TO MARKETING PRICES

Marketing system of ginger functioned entirely in the hands of the private sector, with their capital and intrepreneural ability. They were found in various types of rural markets and exchange points, where the marketing services of assembly, storage, transportation and sales were performed.

Low prices of ginger as compared to prices of input and other commodities consumed by the farmers was a great concern. The exact delima which the farmers faced was that since they were making efforts to increase production so as to meet their pressing needs, the abundance of the crop made prices to remain without any significant improvement. This was seen during harvest time when the crop was in abundance in the market. Prices at that time came down, usually at higher rate, bringing the total revenue down and making the producer poorer.

The process of a sale depends on the amount sold and the price, but for ginger (like any other agricultural product) there seemingly existed a negative correlation between these two. The more the farmers had for sale in the aggregate (especially during harvest) the lower the price. Consequently, the total revenue of the farmers declined.

The structure and organisation of the market prices that were studied show that although the producers were not forced to sell their produce at harvest and could store considerable amount of it, they were the ones that received retail prices of the crop. Moreover, field survey for this study revealed that the farmers were aware that they were poorer at harvest times, such realisation made them to start 'zoning' of villages that would take ginger to the market at particular market days. That implies that certain villages only took ginger to the market at certain market days of the month (mostly twice a month). Defaulters were fined according to the quantity of ginger sold, which was evidently common. To avoid being fined, some of the farmers sold out the crop at home to buyers who usually offered prices lower than the market price.

These issues indicate that there was some downward pressure on prices due to surpluses. The time of harvest coincides with Christmas festive period. The farmers preferred to sell out ginger to meet the festive demands than sell out their food crops, which as well suffered from the same poor price. Ginger harvest season further coincided with tax collection period and children returning to school, which all demanded money. As a result, they sold out their produce cheaply between November and April (76.2%).

When prices eventually increased between May and October, very few farmers had ginger to sell. But, that was the time they needed money most for farming operations and fertilizers purchase.

Although prices of the crop were generally low, those farmers that were situated close to local markets or the bigger markets like Kwoi, Kubacha, Kachia and Walijo, had access to several types of buyers and a number of different market outlets than those further away or isolated. Those villages located close to rural markets and accessible to transport routes had relatively large number of buyers whose independent action and number seemed high enough to reduce monopolistic practices in ginger price, while contrary was the case with those villages located far away from accessible routes and rural markets.

Figures from the field work indicate that 83.3% of the farmers transported their produce by means of head portage, bicycles and motor-cycles from the farms to their homes. Transportation problems involved both the means and mode of transportation in the sense that certain rural areas were not linked with good roads, and this led to only few buyers getting to these villages and manipulating the prices. On the other hand, those farmers who wanted to market their produce found it difficult because of the cost of transportation, as very few vehicles went to these villages.

Both the 'zoning' concept of sale and lack of storage facilities in the markets further created problems. Those farmers who succeeded in taking their produce to the market but not satisfied with the price offered for the crop that day, could not take the crop back home or store till the next market day. They had to sell at the market price of that day (nor matter how low) because apart from the fact that they could not afford to transport the crop back home, the next market day would not be theirs. Moreover, due to inaccessibility to the means and mode of transportation, these farmers reached the markets late, and still had to sell.

In general, entry into both production and trade of ginger was relatively free to both the rural producers and urban businessmen. This made rural inaccessible areas to have undetermined prices which allowed for the exploitation of the farmers by the intermediaries. This was seen in the fact that from the producers to the foreign exporters there were as many as five intermediaries.

6.3.1 Temporal and Seasonal Price Relationship:

Temporal price relationship was examined within the ginger producing area by analysing seasonal price variation and the trend over the years 1987 to

1991. It shows that ginger prices during the period under study marked some relative increase, somehow similar to the steady increase in production of the crop within the same period of study.

However, there was some remarkable increase in 1989 intermediaries' prices and 1990 quantity of produce (Tables 5.18 and 5.10 respectively), and some drop in 1990 prices and 1991 quantity of produce. The poor prices recorded in 1990, were responsible for the decline in 1991 produce. Due to continuous increase in production, there has not been room for adverse scarcity to create chances of adverse price increase. Gradual increase in supply depress high demand and high price. For these reasons, the price cycle does not respond to development.

Seasonal price variation shows that ginger prices varied seasonally, monthly and even weekly. Except for probably storage houses and the sacks used for parking, storage of ginger had no significant cost. Yet, there were indications of high seasonal price variation among intermediaries and not much difference among producers. That is, those who stored the crop made more than normal profit. Marketing patterns revealed that the farmer was not the beneficiary of the seasonal price increase because he hardly store ginger after six months of harvest.

The implication is that the hypothesis that states that ginger production helps to increase the income and thus the welfare of the rural producers is rejected to be false in this regard because farmers had little or no ginger for sale during the post-harvest season. On the other hand, traders hiked their prices during post-harvest season for high profit.

6.3.2 Spatial Price Relationship:

Major markets in the study area like those of Kwoi, Kachia, Kubacha and Walijo had almost the same price of ginger at various seasons of the years of study, with not more than ₦5.00 difference. This was possibly because of accessibility to good transportation system which helped to increase inter-market arbitrage and fair knowledge of information on prices and supply in the various markets within the area (Table 6.2).

However, there was wide variation of producers' prices between rural areas without markets and areas with major markets. The difference was about ₦50.00 between the two types of villages.

The implication arising from these findings is that roads should be opened up to facilitate movement of people, goods and information within the area.

6.3.3 Marketing Costs and Margins:

This sub-section discusses marketing costs and margins received by farmers and intermediaries. Marketing intermediaries performed services that added to the value of the crop. These services required labour, time and capital and therefore costed money. The marketing margin discussed here is the difference between buying and selling price. The theory is that in a perfect market, the margin received should be commensurate with the costs of services rendered. In order to determine the marketing margins and compare them with the marketing costs and the value added at any stage of the marketing chain, market prices at producers, rural middlemen, assemblers, and wholesalers levels were calculated.

The concurrent method of comparing prices of different levels of marketing at the same point in time was used to derive the gross and net margins. The net price received by farmers was calculated by deducting his production and transport costs from the price paid to him by the rural middlemen/assemblers.

The net margins of the rural middlemen, assemblers and wholesalers were derived by subtracting the purchasing prices and their handling costs from their selling prices (see Table 6.1).

Table 6.1 shows that the markets were operationally inefficient for the crop. Producers' price was not good enough. This is because even though the uncosted data on input compared to selling price show that the farmers were second highest profit makers of ginger production after the wholesalers; gaining between ₦2,070.00 and ₦2,748.00 per tonne over the years of study, the costed data on input compared to his selling price show that they were operating at a loss. For instance, when the cost of ginger production was calculated in 1991, it was discovered that the farmer operated at a loss of ₦1,282.00 per each tonne of ginger he produced. This, however, did not include the income derived from other crops grown together with ginger on the same plot (as was the practice by some farmers). If these other crops were costed, the margin of loss might be narrower.

TABLE 6.1: AVERAGE PROFIT OF GINGER PER TONNE AT VARIOUS LEVELS (1987 - 1991)

YEARS	1987 ₦	1988 ₦	1989 ₦	1990 ₦	1991 NOT COSTED ₦	1991 INPUT COSTED ₦
Rural Producers	2,070	2,246	2,748	2,676	2,978	-1,282+
Rural Middlemen	362	414	438	338	321	
Assemblers	286	418	585	480	552	
Wholesalers	3,524	3,516	2,406	3,208	3,026	

SOURCE: Field Work, 1992

+Every input at producers' level costed.

Each tonne of ginger purchased by rural middlemen and assemblers attracted considerable profit as contained in Table 6.1. The size of net margin for these two categories of intermediaries was considerably reasonable, with assemblers gaining a little more on the average. The net margin for the urban wholesalers, however, was strikingly wide thereby making them to benefit most from ginger production - considering their total cost of purchase and handling to their profit margin.

While the difference in profit margin between rural middlemen and urban wholesalers was ₦3,162.00 in 1987, it dropped to ₦3,098.00 and ₦1,821.00 in 1988 and 1989 respectively. It rose to ₦2,728.00 in 1990 only to drop again in 1991 to ₦2,474.00. The difference in the profit margin between assemblers and wholesalers followed almost the same pattern of fluctuation (Table 6.1).

In view of the fact that profit margin of urban wholesalers in each of the years, 1987 to 1991, was as much as all the other groups (farmers, rural middlemen and assemblers) put together, leaves no doubt that urban wholesalers are the highest beneficiaries of ginger production in the area.

6.3.4 Price Parity Relationship:

The result of findings in Table 5.25 shows that when ginger production was costed the farmer was operating at a loss. That means the farmer paid more for inputs than what he got for his output.

The implication of this finding is that, farmers, even if they got high price for their goods, spent them in producing inputs, thereby keeping their income low. That was so because changes in agricultural inputs were much higher than changes in the prices of the crop.

6.3.5 Some Benefits from Ginger Production in the Area:

Data from the field survey reveal that apart from the fact that ginger production provided income to the farmers of the area, it also provided

TABLE 6.2: PRODUCER'S PRICE OF DRIED SPLIT GINGER PER TONNE AT VILLAGES WITH ACCESSIBLE MARKETS, LESS ACCESSIBLE MARKETS AND ISOLATED VILLAGES

VILLAGES WITH MARKETS ACCESSIBLE BY MAJOR ROAD TRANSPORT	1987 ₦	1988 ₦	1989 ₦	1990 ₦	1991 ₦
Kachia	2,166.00	2,776.00	3,214.00	3,014.00	3,244.00
Kudah	2,058.00	2,602.00	3,144.00	2,958.00	3,174.00
Kwoi	2,194.00	2,802.00	3,220.00	3,022.00	3,262.00
Kubacha	2,108.00	2,744.00	3,162.00	3,016.00	3,118.00
TOTAL	8,526.00	10,924.00	12,740.00	12,010.00	12,798.00
AVERAGE	2,132.00	2,732.00	3,185.00	3,002.00	3,198.00

VILLAGES WITH MARKETS NOT ACCESSIBLE BY MAJOR ROADS	1987 ₦	1988 ₦	1989 ₦	1990 ₦	1991 ₦
Walijo	2,076.00	2,728.00	3,040.00	3,056.00	3,260.00
Daddu	2,038.00	2,614.00	2,968.00	2,860.00	3,040.00
Chori	2,038.00	2,438.00	2,960.00	2,822.00	3,200.00
Nok	1,998.00	2,426.00	2,960.00	2,698.00	3,062.00
Kurmin Musa	1,962.00	2,418.00	2,726.00	2,662.00	3,014.00
TOTAL	10,112.00	12,624.00	14,654.00	14,098.00	15,476.00
AVERAGE	2,022.00	2,524.00	2,930.00	2,819.00	3,095.00

ISOLATED VILLAGES WITHOUT FEEDER ROADS AND MARKETS	1987 ₦	1988 ₦	1989 ₦	1990 ₦	1991 ₦
Ndofa	1,874.00	1,952.00	2,086.00	2,002.00	2,434.00
Fai	2,032.00	2,062.00	2,312.00	2,018.00	2,616.00
Antong	1,754.00	1,808.00	2,202.00	2,146.00	2,558.00
Bursan	1,676.00	1,974.00	2,154.00	2,106.00	2,512.00
Tunga	1,978.00	2,014.00	2,304.00	2,004.00	2,466.00
TOTAL	9,312.00	9,810.00	11,058.00	10,276.00	12,586.00
AVERAGE	1,862.00	1,962.00	2,212.00	2,055.00	2,516.00

SOURCE: Field Work, 1992

some sort of employment in the farm. That is, those times they were less involved in other farming operations tended to be the times most of ginger farming and marketing operations took place.

Some other benefits of ginger production were expansion of land-holding through the clearance and cultivation of new land areas for ginger production, and increasing of soil fertility through the decomposed mulched grasses/leaves and heavy manure application.

6.3.6 Some Side Effects of Ginger Production in the Area:

The field survey again uncovers that the more firtile farmlands that could be used for the production of other crops were used to grow ginger. Also, ginger farming, being labour intensive, took up the farmers' considerable time that could be used ~~for the~~ on their other farm lands, or to rest and have more strength to concentrate on other crops production or some other business.

6.4 PROPOSED SOLUTIONS TO THE PROBLEMS

For ginger to be very productive so as to yield as high as those of Jamaica, India and China, research work to discover hybrid variety of the crop must be carried out by scholars. The present 5 to 15 tonnes per hectare hields as compared to Jamaica's 40 tonnes per hectare should be seriously improved upon. Also, research work for suitable storage chemicals and herbicides for the crop's production should also be given due attention.

6.4.1 Policy Makers:

The following three other policies should be considered for adoption to further remedy the problems, especially to reduce price inefficiency.

6.4.1.1 Farmers' Biased Strategy

There should be correction on the intermediaries huge profit of harvest surplus of ginger to also benefit the farmers. The adoption of this strategy will require the involvement of government in marketing ginger through establishment of an agency that will buy, store and sell the produce like the Marketing Board, but this time it should be farmer oriented. This strategy of price support will create more demand through government purchase, and farmers are most benefited due to increase in market supply at harvest.

In this case, the government will be involvedin exporting the crop, and a lot of the profits go directly into government treasury.

6.4.1.2 Alternative Policies

Where the governments do not wish to take the farmers' biased policy, they can encourage the farmers to store their crops until when they feel prices are in good order. In this case, the farmers who need money during Christmas festivals, or for paying school fees and tax, should be given low interest loans until the crops are sold before the loan is paid back.

6.4.1.3 Supporting Policies

In this other policy, the need to develop roads, in general, especially the development of roads reaching into isolated areas is very vital. This will help not only in the distribution of inputs and evacuation of ginger and other crops, but also in providing better opportunity for the farmer to market his produce.

Also, there should be physical improvement on the markets. Storage houses should be available at affordable prices. There is also need to improve on the input distribution to allow increase in productivity. The co-operative system of organisations for fertilizers supply should be encouraged. Fertilizers companies can make surveys of villages to ascertain village sizes for fertilizers distribution through village representatives. Lower costs of inputs will help make better productions.

6.4.2 Ideological Transformation:

Ideologically, there should come up a reorientation that will aim at restructuring the country's power base in such a way that would help maximise the role of the majority of the population in the processes of government and resource decision making. This will create an appropriate institution for raising the awareness of the majority of the people (who are rural dwellers), and organising and equipping them with the capacity to improve their living standards through adequate incentive and opportunities by performing the tasks the few elites used to perform. And at least, it will lead to not only self-reliance but distributive justice which will give Nigeria the greatest ideological change in the development process.

6.4.3 The Take-Off of the Kachia Ginger Processing Factory:

Another probable solution to problems facing ginger farmers in the study area lies in the policies guiding the operations of the ginger processing industry when it eventually starts production.

If this factory which Kaduna State Government has spent ₦69 million on, and still hopes to spend ₦30 million to put it into full operation, it should try to provide the farmers with funds through loans to boost production. Also, it should buy farmers' produce directly from them to reduce the chain of intermediaries.

According to the technical manager of the industry (a foreigner), there is ready market in Europe for the processed ginger of the factory. He further revealed that a litre of ginger oil, as of August 1992, sold at £300 (Three hundred British Pounds) in Europe. And that within a year the factory will recover all the money invested in it.

If the factory resumes processing, it should emulate the policies of Nigerian Tobacco Company, Zaria to ensure not only continueus supply of raw materials, but also improving the welfare of ginger producers.

In a nut shell, one may say that ginger producers over the years, 1987 to 1991, kept increasing ginger production despite the lots of difficulties both in the production process and in the marketing of the crop. The production of the crop did not adversely affect the production of other crops. Rather, helped in some ways to complement other crops production. This implies that if ginger farmers are given incentives in terms of higher prices, they will increase the area under cultivation as well as greater attention to the crop, which will invariably lead to high production resulting to improved productivity and hence development in the entire agricultural production as well as the rural economy.

Even though ginger prices have been increasing over the years, this increase has not been commensurating with increase in input prices. This has resulted the terms of trade to be adverse to the farmers, which has not been condusive to sustain increases in production cost. Suitable measures should be taken to give incentives to the farmers in terms of high prices, through farmers' biased crop, buffer stocking, orderly distribution and subsidization of certain inputs. Therefore, there is need for a long term price policy in Nigeria's cash crops, and agriculture in general, bearing in mind producers' interests.

Even where all these fail to come by, the ginger processing factory should make policies that will help to improve the welfare of ginger producers. This is because it will help in sustaining large increase in raw materials and thus greater development of the industry.

CHAPTER VII

CONCLUSION

After a close observation of the present state of Nigerian economy, particularly the general increase in both production and prices of agricultural commodities, this study was carried out to examine the role of ginger production in the rural economy. The government has officially increased the prices of certain cash crops without giving attention to ginger. Yet, ginger prices in the open market were discovered to be increasing. This study tried to find out whether this increase in the marketing price of ginger in the open reflected in the income of the producers of the crop so as to facilitate improvement in their well-being.

The complexity of these problems were a source of inspiration to investigate and gather data on the cost of inputs and outputs of the crop as well as on the conduct and performance of the market structure.

Aspects related to ginger production were carefully examined and cost of operation of each aspect calculated. Among them are land clearing, ploughing, harrowing, planting and mulching. Others include weeding, digging, transportation of the crop home, and processing of the crop (splitting or peeling and washing) for marketing. These processes spread throughout the year - with a few of the aspects coinciding with the time of production of other crops. These aspects of production, however, demanded a lot of labour and money. Weeding, which coincided with the time of other crops production, seemed to be a very big problem. So also seed storage.

The marketing system of ginger, it was discovered, functioned entirely in the hands of private businessmen. The crop passed through a chain of intermediaries, namely: rural middlemen, rural assemblers and urban wholesalers. Although these intermediaries performed some important functions, their income was quite high relative to their services. They were able to exploit the abundance of the crop at harvest and lack of physical facilities in some areas to increase their share of final selling price.

Over 76% of ginger farmers sold out their produce during harvest season of between November and April to pay taxes and to meet essential demands. They hardly had the crop for sale at the times prices went up (increased). Marketing forces at work did not allow them to make significant profit from the crop. Their income from ginger was only relatively significant when the cost of production was ignored. But when the cost of production was deducted from his revenue, the farmer was seen operating at some loss. It was so, however, because the research work could not cost other crops that were sometimes grown together with ginger on the same plot.

The over-all picture of ginger marketing in the area reveals that intermediaries, particularly the urban wholesalers, were the highest beneficiaries of ginger production in the area, considering the services they rendered in comparison to their profits.

For the farmers to get a significant profit from the crop, good measures have to be taken. Such measures could be either on research work to increase production per hectare so as to reduce extensive labour, or in improving market prices at producers' level through policy making or ideological transformation.

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APPENDIX A

QUESTIONNAIRE A: FOR GINGER PRODUCERS

This questionnaire has been designed for the purpose of gathering information for a research programme titled: "The Effects of Ginger Production on Rural Income in Jaba and Kachia Local Government Areas of Kaduna State" - which is in partial fulfilment of the requirements for the award of an M.Sc. degree (Rural Development) of Ahmadu Bello University, Zaria. Your co-operation towards the success of the research is highly solicited.

SECTION A: GENERAL

1. (a) Village:................ (b) Local Govt. Area:...........
2. Sex: (a) Male ☐ (b) Female ☐
3. Age:..
4. Marital Status: (a) Married ☐
   (b) Single ☐
   (c) Divorced ☐
5. Educational Qualification:
   (a) Adult Education only ☐
   (b) Some Primary Education ☐
   (c) Full Primary Education ☐
   (d) Some Secondary Education ☐
   (e) Full Secondary Education ☐
   (f) Post-Secondary Education (specify):........................
6. Main Occupation:..
7. Other Occupation(s):..

SECTION B: LAND AND PRODUCTION (CROP)

8. How many plots of farmland (football field size) do you have? ....
9. How did you acquire the land? Through:
   (a) Inheritance ☐
   (b) Borrowing ☐
   (c) Hiring ☐
   (d) Purchase ☐
   (e) Gift ☐

10. How far apart are your two largest farm plots from each other?

11. How many of your farm plots do you cultivate each farming season?

12. How many of these plots do you devote to ginger production?

13. Of the following crops, tick those you produce:

(a)	Cocoyam	☐	(f)	Rice	☐
(b)	Guinea corn	☐	(g)	Millet	☐
(c)	Maize	☐	(h)	Cassava	☐
(d)	Acha	☐	(i)	Beans (Achi-shuru)	☐
(e)	Yam	☐	(j)	Groundnut	☐
(l)	Others (specify)....		(k)	Soya Beans	☐

14. Indicate which of the crops you grow together on the same plot and the size of farm plot:
    (a) Guinea corn/Maize/......... plot size ....
    (b) Rice/Yam/......... size ....
    (c) Yam/Cassava/............ size ....
    (d) Cocoyam/Cassava/......... size ....
    (e) Acha/Millet/............. size ....
    (f) Groundnut/Achi-shuru/Millet/......size.......
    (g) Others:..

15. What crops do you inter-plant with ginger?

16. How do you assess the crops you inter-plant with ginger?
    (a) They yield very well ☐
    (b) They yield well ☐
    (c) They yield is poor ☐
    (d) Just like sole cropping ☐

17. How far away from your residence are your:
    (a) 1st ginger plot? ....
    (b) 2nd ginger plot? ....
    (c) 3rd ginger plot? ....
    (d) 4th ginger plot? ....

18. How far away from your residence are your:
    (a) largest food crops farm plot? ....
    (b) 2nd largest food crops farm plot? ....
    (c) Other farm plots? ....

19. In what year did you start growing ginger? ....

20. Was there any year you did not grow ginger?
 (a) Yes ☐ (b) No ☐

21. If yes, what prevented you from growing ginger that year?

22. How many bags of dried ginger did you produce in:
 (a) 1987 .... (d) 1990 ....
 (b) 1988 .... (e) 1991 ....
 (c) 1989 ....

23. For how long do you grow ginger on a plot before rotating with other crops or fallowing?

24. How long do you allow your ginger farm to rest before growing ginger on it again?

25. When allowing your ginger farm to rest, do you grow other crops on it?
 (a) Yes ☐ (b) No ☐

25. If yes, what other crops do you grow?
 (a) 1st year ....
 (b) 2nd year ....
 (c) 3rd year ....

26. How do you assess these other crops you grow after growing ginger on the land?
 (a) They yield very well ☐
 (b) They yield well ☐
 (c) They don't yield well ☐
 (d) No difference ☐

27. How many people regularly work on your farms? ....

28. Do you feel you have adequate manpower for your farming operations?
 (a) Yes ☐ (b) No ☐

29. If no, which of your crops require more manpower?

30. Why do the crops require so much labour?

31. From what sources do you get your labour?
 (a) Family labour ☐
 (b) Hired labour ☐
 (c) Communal labour ☐

(d) Co-operatives ☐
(e) Contract labour ☐
(f) Others:...

32. Which of the following farming operations do you normally carry out in growing ginger?

(a) Land clearing ☐
(b) Harrowing ☐
(c) Ploughing ☐
(d) Cutting of grass ☐
(e) Planting ☐
(f) Mulching ☐
(g) Transporting of seeds and grass to farm ☐
(h) Weeding ☐
(i) Manuring ☐
(j) Harvesting ☐
(k) Transporting produce home ☐
(l) Use of herbicide ☐

33. How much does it cost you to produce ginger on a plot of about $\frac{1}{4}$ of football field by means of:

(a) Land clearing ₦.................
(b) Harrowing ₦.................
(c) Purchasing of seeds ₦.................
(d) Ploughing ₦.................
(e) Cutting of grass ₦.................
(f) Transporting of seeds and grass to farm ₦.................
(g) Sowing ₦.................
(h) Mulching ₦.................
(i) Manuring ₦.................
(j) Weeding ₦.................
(k) Harvesting ₦.................
(l) Transporting it home ₦.................

34. How do you procure the mulching grass?

(a) Cut all by self ☐
(b) Cut some by self ☐
(c) Purchase some ☐
(d) Purchase all ☐

35. Types and quantity of fertilizer used on the same size of farm:

		1987	1988	1989	1990	1991
Number of bags used:	NPK	....	....	....	....	....
	Supper	....	....	....	....	....
	Urea	....	....	....	....	....

36. How many gallons of herbicide do you use on the same size of farm?

37. What are the sources of your finance for purchase of inputs?
(a) Personal savings ☐
(b) Borrow from relatives ☐
(c) Donations from relatives ☐
(d) Loan from banks ☐

38. Do you use tractors?
(a) Yes ☐ (b) No ☐

39. If yes, how much did it cost you to cultivate one hectare (football field size) of land in the following years:

	1987	1988	1989	1990	1991
(a) Ploughing	N.....	N.....	N.....	N.....	N.....
(b) Harrowing	N.....	N.....	N.....	N.....	N.....
(c) Sowing	N.....	N.....	N.....	N.....	N.....
(d) Herbicide appl.	N.....	N.....	N.....	N.....	N.....
(e) Weeding	N.....	N.....	N.....	N.....	N.....

(f) Others (specify)...

40. What problems do you encounter in getting hired tractors?

41. What problems do you encounter in getting hired labour?

42. Through what means do you transport your ginger from:
(a) Farm to your house? N..............................
(b) Your house to the market? N.....................

43. How much does it cost for the transportation of one bag (sack) of ginger from
(a) The farm to your house N.....................
(b) Your house to the market N.....................

44. How much hired labour does it cost you to peel one sack of ginger?

45. How much hired labour does it cost you to split the same quantity?

46. What is the cost of transporting fertilizer from where you but to:
(a) Your house N.....................
(b) From your house to the ginger farm(s) N.....................

47. List other inputs you use on your ginger farm.

SECTION C: SALE

48. In what form do you sell your ginger?
   (a) Fresh [ ]   (c) Dry split [ ]
   (b) Dry Peeled [ ]   (d) All of the above [ ]
   (e) Others (specify)...

49. State the price of a bag of ginger in the following years

		1987	1988	1989	1990	1991
(a)	Fresh	N.....	N.....	N.....	N.....	N.....
(b)	Dry peeled	N.....	N.....	N.....	N.....	N.....
(c)	Dry split	N.....	N.....	N.....	N.....	N.....

50. To whom do you sell your ginger?
   (a) Rural Middle Men [ ]
   (b) Rural Assemblers [ ]
   (c) Urban Wholesalers [ ]
   (d) Urban Retailers [ ]
   (e) Ginger Factory [ ]
   (f) Others (specify)...

51. In what form will you prefer to sell your ginger?
   (a) Fresh [ ]   (c) Dry split [ ]
   (b) Dry peeled [ ]   (d) Others(specify)...............

52. To whom will you prefer to sell it?
   (a) Rural Middle Men [ ]
   (b) Rural Assemblers [ ]
   (c) Urban wholesalers [ ]
   (d) Urban Retailers [ ]
   (e) Ginger Factory [ ]
   (f) Others (specify)...

53. Why will you prefer to sell to the group of people you choose in No. 55?
   (a) They pay better [ ]
   (b) They offer me loans [ ]
   (c) They are the most accessible to me [ ]
   (d) Its too cost to transport it to the market [ ]
   (e) Others (specify)...

54. At what place will you prefer to sell your ginger?

(a) In the farm ☐ (c) In the market ☐

(b) In my house ☐ (d) In Ginger Factory ☐

(e) Others (specify)...

55. Give reasons to your answer of No. 54.

56. What period of the year do you sell your ginger?

(a) November - January ☐

(b) February - April ☐

(c) May - July ☐

(d) August - October ☐

57. What period of the year will prefer to sell it?

(a) November - January ☐

(b) February - April ☐

(c) May - July ☐

(d) August - October ☐

58. Give reasons for your choice of time in No. 57 above.

59. List the effects of ginger production on your other crops

Good effects		Bad effects	
(a)	....	(a)	....
(b)	....	(b)	....
(c)	....	(c)	....
(d)	....	(d)	....

6 0. What important thing(s) have you done with the money you realise from ginger production?

61. Make a general comment about ginger production.

APPENDIX B

QUESTIONNAIRE B: FOR RURAL MIDDLEMEN AND RURAL ASSEMBLERS

SECTION A: GENERAL

L.G.:......................

1. Questionnaire Number:..................... Date:.................

2. Market/Village:..................... Town You Live:..............

3. Sex: (a) Male ☐ (b) Female ☐

4. Marital Status:
   (a) Married ☐
   (b) Single ☐
   (c) Divorced ☐

5. Highest Educational Qualification:
   (a) None ☐
   (b) Primary ☐
   (c) Adult Education ☐
   (d) Secondary ☐
   (e) Post - Secondary ☐
   (f) University ☐

6. Occupation: (a) Main:.....................................
   (b) Secondary:.................................

SECTION B: PURCHASE PRACTICES

7. How did you come to the market? ....

8. How often do you come to this market?
   (a) Every week ☐
   (b) Twice a week ☐
   (c) Once a week ☐
   (d) From time to time ☐
   (e) This is my first time ☐

9. Do you buy from specific sellers?
   (a) Yes ☐ (b) No ☐

10. If yes, why do you prefer to buy from these individuals? ....

11. Do you also buy from sellers in their houses or you buy only from the market?

    (a) From market only ☐
    (b) Also from their houses ☐

12. If you also buy from their houses, which of the two do you but it cheaper?

    (a) Market ☐ (c) It all cost the same ☐
    (b) Houses ☐

13. How many sacks of ginger do you expect to buy today?

    (a) 1 - 10 bags ☐
    (b) 10.5 - 20 bags ☐
    (c) 20.5 - 30 " ☐
    (d) 30.5 - 40 " ☐
    (e) 40.5 and above bags ☐

14. Why are you going to buy only this amount?

    (a) Because this is all you can buy at a time ☐
    (b) Because this is all the money you have ☐
    (c) Because you cannot transport more than this ☐
    (d) Others (specify):......................................

15. To what place will you take the ginger you buy today?

    (a) To other rural markets ☐
    (b) To a factory in Kachia ☐
    (c) To urban markets ☐
    (d) To urban employer ☐
    (e) I will sell it in this market ☐
    (f) To the seaport for export ☐
    (g) Others (specify):......................................

16. Who will sell them for you?

    (a) Self ☐
    (b) Wholesaler ☐
    (c) A Retailer ☐
    (d) A Commission Agent ☐

17. What other markets do you buy ginger from?

List of Market	Day/Date	Amount of Purchase	Place Taken To	Frequency
1............	....	....	....	....
2............	....	....	....	....
3............	....	....	....	....
4............	....	....	....	....

18. Do you buy other crops other than ginger?

(a) Yes ☐ (b) No ☐

If yes, specify:...

19. Why do you buy other crops? ☐

(a) I find them cheap ☐

(b) My employer ask me to do so ☐

(c) I trade on them in addition to ginger ☐

(d) There is no enough ginger to buy ☐

20. How much did a sack of ginger cost you last market day?

Price/Bag	Cost of Transport/Sack	Cost of Storage	Total Handling Cost	Reselling Price/Sack
....	....	....	....	....

21. Average number of sacks of ginger bought and sold in:

1987	1988	1989	1990	1991
....	....	....	....	....

22. Average cost per sack of ginger bought and sold in:

	1987 B	1987 S	1988 B	1988 S	1989 B	1989 S	1990 B	1990 S	1991 B	1991 S
November-January	N...	...	N...	...	N...	...	N...	...	N...	...
February-April	N...	...	N...	...	N...	...	N...	...	N...	...
May - July	N...	...	N...	...	N...	...	N...	...	N...	...
August - October	N...	...	N...	...	N...	...	N...	...	N...	...

B = Bought S = Sold

23. Why do you think the farmer sell to you rather than market his produce himself?

(a) He needs the money before market day ☐

(b) You sometimes loan him money ☐

(c) You give him a better price ☐

(d) He cannot transport it to market ☐

(e) Others (specify):...

24. Are you a buying agent for a big firm?
    (a) Yes ☐ (b) No ☐

25. If yes, whom do you buy for?
    (a) Factories ☐ (b) Urban wholesaler ☐
    (c) Government ☐ (d) Rural Assembler ☐
    (e) Others (specify):..

26. Are you a buying agent to a wholesaler?
    (a) Yes ☐ (b) No ☐
    If yes, where is he based? ....

27. Do you have a licence as a buying agent?
    (a) Yes ☐ (b) No ☐

28. If yes, how much does it cost you? ₦........................

29. Do you buy ginger fresh or dry?
    (a) Fresh ☐
    (b) Dry ☐
    (c) Both ☐

30. Do you sell it fresh or dry?
    (a) Fresh ☐
    (b) Dry ☐
    (c) Both ☐

31. If you buy it fresh and sell it dry, how much does it cost you to process one sack for sale? ₦................................

32. To what uses will the ginger be put by those to whom you will sell it?
    ....

33. What problems do you encounter in the ginger trading business?
    ....

34. What are your comments on ginger production and marketing in the study area?
    ....

APPENDIX C

QUESTIONNAIRE C: URBAN WHOLESALERS

1. Questionnaire Number:................. Date:....................

2. Market Town:..

3. Respondent's Sex: (a) Male ☐
   (b) Female ☐

4. Respndent's Home Town:......................................

5. Age:..

6. How many years have you been in ginger trading business?

   ....

7. How did you get started in the business?
   (a) Was introduced by friends ☐
   (b) It is fa family business ☐
   (c) Was trained by another trader ☐
   (d) Others (specify);.......................................

8. Where di you get the money to get started?
   (a) Personal savings ☐ (d) From banks ☐
   (b) From relatives ☐ (e) Through co-operatives ☐
   (c) From friends ☐ (f) Others:..................

9. Do you have labourers (agents) working for you?
   (a) Yes ☐ (b) No ☐

10. If yes,
   (a) How much do you pay each? N.................... per month
   (b) How many are they? ....
   (c) What markets do they operate? ....

11. How do you get your supply of ginger?
   (a) Buy from other markets ☐
   (b) Buy from the farmers who bring them to the market ☐
   (c) Buy from rural assemblers who bring them to the market ☐
   (d) Others (specify):.......................................

12. How much did you buy a sack of ginger in:

1987	1988	1989	1990	1991
N.......	N.......	N.......	N.......	N.......

SELLING PRACTICES AND COSTS

13. Who do you sell your ginger to? (Tick as many as possible)
(a) To ginger factories
(b) To other urban wholesalers
(c) To urban retailers
(d) To exporting firms
(e) To urban consumers

14. Which of the following channels is the most important means of selling your ginger?
(a) Exporting firms
(b) Urban retailers
(c) Other wholesalers
(d) Ginger Factories
(e) Urban consumers
(f) Others (specify):..

15. How many bags of ginger do you sell on the average:
(a) Per day? ....
(b) Per week? ....
(c) Per annum? ....

16. How much did you sell a sack in

1987	1988	1989	1990	1991
N.......	N.......	N.......	N.......	N.......

17. State the quantity of ginger you bought and sold in the following years:

	1987	1988	1989	1990	1991	
Bought	......	......	......	......	......	tons
Sold	......	......	......	......	......	tons

17. What is your general comment on ginger production and marketing?
....

18. To what uses will the ginger be put by those to whom you sell it?

....

20. Is ginger bought from other parts of the world into Nigeria?

(a) Yes ☐ (b) No ☐

21. If yes, where is it bought from?

....

22. List the users of ginger within and outside Nigeria:

(a) Within:..

(b) Outside:...