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BIOGRAPHICAL SKETCH

The author was born August 27, 1931, in the village of Dubli, Punjab, India. He completed his high school education at D. B. School Patti and entered Khalsa College, Amritsar, in the year 1948. He was graduated with a Bachelor's degree in Agriculture in 1952.

He taught in a high school for six months. At the end of 1952 he joined the Food and Civil Supplies Department as Senior Analyst. In 1953 he joined Pepsu Agriculture Department as Field Assistant and worked on agronomic trials. In 1954 he was transferred as Agricultural Extension Officer in Bhadson Development Block, where he also officiated as Block Development Officer for some time.

In 1958 the author resigned his extension job in order to enter Cornell University for graduate work. He earned his M.S. degree from Cornell with a major in extension education. From the fall of 1959 to the fall of 1961 the author worked on his doctorate at Cornell University. During the year 1960-61 he worked as a graduate assistant in the comparative extension education program.

In 1961 he took an assignment with the Food and Agriculture Organization of the United Nations to work as Extension Specialist to the government of Northern Nigeria. The author attended Cornell University for the spring term 1963 to complete his doctorate, on leave from FAO. He plans to return to Northern Nigeria for further work with the Food and Agriculture Organization.

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The data used in this dissertation were originally assembled for a socio-economic survey of peasant agriculture carried out by the writer while serving as an extension specialist to the Government of Northern Nigeria under the United Nations Expanded Program for Technical Assistance. The writer expresses appreciation to the Food and Agriculture Organization of the United Nations and the Government of Northern

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Appreciation is expressed to the Watumull Foundation for the grant to cover the expenses for processing the final copy of this thesis. Financial help received from American Friends Service Committee in the form of a scholarship during my graduate study is also acknowledged.

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DEDICATED TO

THE RURAL PEOPLE OF MAKARFI DISTRICT

IN NORTHERN NIGERIA

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CHAPTER I

INTRODUCTION

The Nature and Significance of the Problem

The post-World War II period can genuinely be called an Era of Development. It can more specifically be said to be a period of rural development in the underdeveloped countries of the world, which constitute a major portion of the human population. This period saw an immense increase in international communications brought about by increased travel, increased use of written material and other means of mass media. This was partially a by-product of the war, which also facilitated and accelerated a much faster development of technological and scientific innovations.

During the post-World War II period there was a phenomenal increase in international travel. People from underdeveloped, poor and colonized countries began to travel abroad in increasing numbers mainly for higher education. The contact of most of these underdeveloped countries with the countries of Western Europe was not a new phenomenon. Only the frequency of contacts increased. However, the most significant development in this respect was the establishment and increase of contact between the underdeveloped countries of Asia, the Middle East, and Africa with the new world, mainly with the United States of America.

Increased contact with the western countries partially influenced the acceleration of the processes of gaining independence and self government in underdeveloped nations. Such processes and struggles were in many cases started before World War II. Communications and education merely increased the awareness and need for independence in such countries. Whereas, in many other countries such an increase in understanding and new knowledge brought by the individuals who travelled to western countries, started the struggles for gaining self government. Such individuals contributed significantly in awakening their own people to the need for independence. The support for these ideas comes from the fact that most of the political leaders who led their countries in struggles for independence were educated in western countries. Thus the period of post World War II experienced the freeing of many nations one after the other from the colonial rule.

With newly gained independence, the leaders of such countries became interested in developing their own countries. Their free status made it possible for them to establish and develop contacts with the outside world. These contacts were in most part educational, political, economic, and socio-cultural as well as technological in nature. As far as education is concerned, there took place a shift in the attitudes of the people of underdeveloped countries. This shift was partially affected by the contact with the new world, mainly the United States. The shift contained a change of emphasis from the learning of arts and humanities in the European universities to the learning of practical and useful skills, whose need and applicability could be seen in their home countries. More and more scholars from underdeveloped countries began to seek knowledge in sciences and technical fields.

Along with this shift in attitudes towards education from traditional to pragmatic, there took place another awareness among the emerging countries. The development of American agriculture impressed them highly and many countries, realizing the importance of the role of the development of agriculture in the economic development process, began to think in terms of agricultural development. Most of these countries are producers of primary agricultural products, which contribute heavily to the national income as well as are a main source of earning foreign exchange--a dire necessity in developing countries.

The agriculture of most of these countries is characterized by small scale peasant farmers. In general usage, most of the authors call such agriculture "subsistence farming"--at least in major parts of the underdeveloped world. Actually very few places in underdeveloped countries have the type of agriculture which can truly be called subsistence agriculture. In actual practice most of these economies have among them the elements of subsistence as well as market agriculture to varying degrees. In such countries the problems of agricultural development, which the developers, planners, and administrators of agricultural development face, involve the raising of agricultural production from such family peasant farms, and gearing it more towards the market type of economy.

One alternative available to such countries in this respect is to increase the total production of the country by bringing into use more resources such as land, capital, and labour. This can usually be done to a certain extent in the development process. The availability of such resources as capital puts limitations on such an approach beyond a certain stage in many of these countries. Most of these countries are

located in the tropics and by incidence are also characterized by high density of population. The use of labour-intensive practices in agricultural development is the implication. Therefore, the other alternative available for agricultural development is to raise the productivity of labour from the same land by the use of scientific methods, technological innovations, and by the improvement of management practices on the peasant family farms.

In order to accomplish the objectives of agricultural development, two methods have been used over the world. The methods vary with the political ideologies which different countries follow. Most of the Communist countries have tried to solve the problems of agricultural development by changing the basic organization of peasant social structure. Some of the recent examples are the Chinese Communes. A comparatively older example is shown by the collective farms of Soviet Russia. It will be futile to go into a detailed discussion of the advantages and disadvantages of these, and whether a change in the basic organization of peasant society is necessary for agricultural development or not. The issue is an ideological one and is usually decided by each country itself. Most of the newly independent countries have not selected such a reorganization of the agricultural society as a means and an end for development. The crux of the problem, as far as the present thesis is concerned, lies in the fact that fortunately most of the underdeveloped countries have selected and are selecting the democratic way of government. Therefore, the systems and methods of economic as well as agricultural development must be in line with the basic philosophical system of thought of a country. As far as the selection of methods for the development of a democratic society are concerned,

John Dewey's following statement gives a fair direction:[1]

> The devotion of democracy to education is a familiar fact. The superficial explanation is that a government resting upon popular sufferage cannot be successful unless those who obey their governors are educated. Since a democratic society repudiates the principles of external authority, it must find a substitute in voluntary disposition and interest; these can be created only by education.

In line with the democratic values, the methods of development and of raising the farm production and ultimately the levels of living of rural masses in such newly developing countries can be broadly classified as "educational."

The post-World War II period has also seen the start of cold war, the threat of communism, the coming into existence of the United Nations and its specialized agencies. This period also experienced a consciousness on the part of newly emerging countries to be politically stable and economically developed. A willingness of the major western powers, mainly the U.S., to help the war-torn and underdeveloped countries, and a complex of other factors including the ones mentioned above, brought into being the concept of technical as well as economic foreign aid in the world on a massive scale. As far as the development of underdeveloped countries is concerned, it is natural that the emphasis should be given to agricultural development in the technical assistance programs, at least in the beginning years. The agencies engaged in helping underdeveloped countries develop their agriculture are connected with the United States Government, the United Nations agencies such as the Food and Agriculture Organization, and other international agencies such as the Colombo Plan. Other numerous private,

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[1]John Dewey, Democracy and Education (New York: Macmillan & Co., 1961), p. 87.

church, and voluntary organizations such as the Ford Foundation and the Rockefeller Foundation are engaged in this work. Of recent origin are several government and non-government organizations and agencies interested in technical assistance to underdeveloped countries from many European nations.

Various aspects of agriculture with varying degrees of intensity have been and are being studied by these agencies. The advice, recommendations and counsel are being given to many such countries. Among other improvements being brought into agricultural patterns, methods, and institutions in the underdeveloped countries, the improvement of peasant agriculture is being given a lot of emphasis. In line with the democratic values, the methods of improving production on the family peasant farms have to be educational. It has been considered necessary that educational means and methods must equip the individual farmers for responsible and effective choice-making instead of following tradition. The task of educating the farmers is very difficult considering the rates of literacy, which are very low, the traditional nature of such societies, and the underdeveloped communications. Therefore, a search for an effective educational institution that will impart the necessary knowledge, skills, and attitudes to the peasant farmers has been a paramount question throughout this period. At the same time, a search for new educational methods suitable for such cultures has been a key activity.

During the process of technical assistance, attention has been brought to the Cooperative Extension Services of the United States. Within the U.S. the extension services have been considered one of the most important agencies of the United States Department of Agriculture.

During the period after World War II, this kind of organization has been highly recommended to other countries as an effective agency to bring about the required changes and improvements in agriculture.

Agricultural experts, economic planners, and plan administrators from many newly developing countries have observed and studied the Cooperative Extension Services in the United States and admired it. In many other countries of the world attempts have been made to establish a similar system of "out-of-school informal education." Technical assistance in this respect has been given by the personnel of such agencies whose basic source of inspiration and knowledge was the Extension Services of the United States. Experience gained from elsewhere, mainly from Anglo-Saxon countries who had learned such work from the United States earlier, also helped in the modifications of patterns and methods in the post-World War II period. Such experience was used with advantages in the earlier work in the countries of Asia, Oceania, Middle East, and countries of South America. Several modifications have been made, and the patterns of organization and the type of activities undertaken by such newly developed agencies varied from place to place. Similarly, the degree of success of such systems also cover a wide range. It is not within the scope and purposes of present discussion to go into the details of different patterns of extension work over the world. The literature of Comparative Extension Education gathered by way of student papers and Comparative Extension publications at Cornell University's Extension Education Division is full of such case studies. It can be found from the study of such literature that, though the basic principles of extension education are more or less the same over the world, the patterns of organization and methods of work

vary according to physical, social, cultural, political, as well as administrative, conditions.

Delimitation of the Problem

Up to the present time, most of the Asian countries have established extension services with the help of various Technical Assistance Agencies connected with rural life and agriculture. The Asian countries were the first to gain self government. During the last five to seven years many African countries have gained independence. Some of them are still in the process of gaining self government. Most of these new African countries are anxious to get started on the economic development processes. Agriculture, being the main and primary source of wealth, is receiving its due attention for development. The growing awareness about the usefulness of extension education as a means of developing peasant agriculture has also caught up with the African countries. Agricultural extension services are, or will be, an integral part of the agricultural development programs in these countries.

In Africa, as elsewhere in the underdeveloped countries, there are many obstacles in the way of development of extension services. Among other things is the lack of trained personnel, a shortage of finances, and a general scarcity of resources available to the governments. Very little is so far known about the socio-economic conditions in rural Africa as related to agricultural development. Knowledge about the rural educational programs in Africa is also limited. In view of the above circumstances it is pertinent, in order to establish a sound program of agricultural extension education under African conditions, to study the socio-economic structure in the rural areas. The

understanding gained from such a study can give the planners some guidelines or hypotheses for the establishment of this work. The need for the study of conditions and modifying the extension organizations, methods of teaching, and program planning, as well as evaluation according to the local conditions, has been stressed time and again. Mosher's[2] point of view in this respect is worth noting:

> The factors to be taken into account in finding effective programs for rural development are so numerous, and local conditions vary so much, that finding a satisfactory pattern on the first attempt is unlikely. . . . It is never safe to take the "successful" national pattern of programs of any country and model a national program in another country on it. . . .

Stressing the importance of experimentation through the pilot projects, he says, "These (pilot projects) may borrow heavily from methods in other countries, but every effort should be made to build them out of an analysis of local conditions and needs."[3] In another publication Mosher stresses the need for research in the fields of Extension Education and Community Development. He says:[4]

> Despite their great and unique potential value, programs of extension education and community development in low-income countries have been much less effective than they might be, largely due to the false assumptions and inadequate background knowledge. Herein lies the need for considerable research in this field.

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[2]A. T. Mosher, Varieties of Extension Education and Community Development, Comparative Extension Publication No. 2 (Cornell University, 1958), p. 107.

[3]Ibid., p. 107.

[4]A. T. Mosher, Research in Rural Problems, Development of Emerging Countries--An Agenda for Research (Washington, D. C.: The Brookings Institute, 1962), p. 90.

Yang[5] warns against transferring a system of extension education from one country to another without modifications and implies the need for proper understanding of the rural conditions before working out a pattern for a particular country when he says:

> In considering the problem facing a country while building an extension or advisory system, it seems worthwhile to bear in mind that no extension system or organization copied from a foreign pattern could be expected to work as satisfactorily in a peasant or agrarian society as in the modern industrially developed one. It would be folly to transplant without modification the extension system or organization from one area to another, where economic, social and cultural conditions may differ.

Several other instances are available where a similar need for understanding has been stressed before initiating a program or an agency. This has been stressed in order to avoid wastage of human as well as material resources, so scarcely available in newly developing countries. Out of such an awareness and recognition of the need for understanding the local conditions before a project is actually undertaken, emerged a recently-developed concept of Pre-investment surveys sponsored by the Technical Assistance Agencies connected with the U.N. Though most of such pre-investment surveys have been undertaken in connection with the physical development of resources, this kind of idea can also be applicable to the development of extension services. The data for such surveys should be collected from the point of view of developing an extension organization and service. In such a belief the present study was conceived and its significance to a large extent derived.

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[5]H. P. Yang, Social Considerations in Extension Development (unpublished paper presented at FAO/CCTA Agricultural Extension Development Centre, Arusha, Tanganyika, 6-11 February, 1962), p. 4.

The government of Northern Nigeria recognized the need for having such data available from the rural areas of that country as they thought it would help in setting up an extension service. On the basis of such thinking they requested the Food and Agriculture Organization of the U. N. for Technical Assistance.[6] The data reported in this thesis is a part of the work done by the author in Northern Nigeria on an assignment with the Food and Agriculture Organization of the United Nations.

Objectives of the Study

The major and general objective of this study was to collect factual basic relevant information on socio-economic and educational aspects of rural life in Northern Nigeria, and from such data to gain understanding deemed basic to the establishment, development, and improvement of an on-going or a future program of agricultural extension education designed to assist rural people (peasant farmers) in the improvement of their agriculture. Included in this overall objective were the following specific major objectives which this study seeks to attain:

1. To discover and record sociological data and characteristics of the organization of rural life at the community level in a selected area and to find out its relationships with the district, emirate, and regional level organizations.
2. To discover the basic sociological, educational, as well as economic characteristics of the rural population.
3. To discover the types of educational institutions, organizations, and interests existing among the people in the rural areas.

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[6]FAO team on this project consisted of an extension specialist, a home economist, and an agricultural economist.

4. To find out educational means, methods and the existence of educational mass media impinging on rural life at present.

5. To discover, describe, and record some of the qualitative aspects of peasant agriculture, including the economic interests of the farmers, which will give an indication of existing methods, patterns, and technology in use and information regarding the present level of associated skills of the rural people.

6. To make an evaluation of the present levels of contact of different kinds of extension workers with the peasant farmers and to discover the situations of contact in which farm people learn from extension workers on specific aspects of agriculture.

7. To assess the attitudes of the rural people towards changes in agricultural practices and their willingness to learn new and improved agricultural methods.

8. To find the extent of changes in the present levels of agricultural practices and the extent of farmers' present levels of knowledge about the existence of improved farm practices.

9. To explore the nature of the diffusion process of an already diffused practice in terms of sources of information, channels of communication, effectiveness of methods at different stages as well as the characteristics of early adopters.

10. An underlying objective of this study was to collect basic relevant knowledge about the Northern Nigerian agriculture and rural people to serve as a bench mark for further experimental and research work in the field of extension education.

Basic Assumptions

There are a number of assumptions on which this study is based. The first of these assumptions is that a knowledge and understanding of the ways the rural life in a given situation is organized socially, politically, and culturally sets some limits and conditions to the type of organization and administration and the suitability of methods in the conduct of Agricultural Extension Education work.

The second most important assumption is that a knowledge of educational institutions, organizations, means and media in use in a

given area as well as the educational interests of the rural people can give us some indications which will help the extension workers in conducting educational activities more effectively.

The third assumption of the study is that an evaluation of the existing extension activities, especially the evaluation of the contact situations and its effects on the learning of new things about agriculture, can help make more effective future contact by extension workers.

Another assumption is that an understanding of the physical aspects of agriculture and a study of the existing patterns and methods of farming will indicate the scope of educational activities that can be undertaken in agricultural extension education work.

The fifth assumption is that a knowledge and understanding of the diffusion process of an existing agricultural practice in the Nigerian villages in terms of the channels of diffusion of information, effectiveness of different educational and other information media at different stages of the diffusion process, and the characteristics of early farm practice adopters will be helpful in suggesting some educational approaches to agricultural extension education work.

Limitations of the Study

As will be clear from the objectives mentioned in the foregoing pages, the study is largely descriptive and exploratory in nature. It was not meant to test any particular set of hypotheses or a particular theory in a given field of specialty. The basic purpose was to collect information on relevant aspects and on the basis of such information propose some propositions or hypotheses for establishing or improving the program of agricultural extension education work among the peasant

farmers of Northern Nigeria. The proposing of hypotheses is merely arbitrary, mostly based on a study of comparative extension education literature. For example, if under a particular set of circumstances or conditions a country adopted successfully a particular form, method or procedure of extension education, it is hoped that in similar or near-similar sets of circumstances or conditions that particular type of extension service would be successful.

However, knowledge from different aspects of different fields of study, including rural education, rural sociology, agricultural economics, agriculture, and public administration, was utilized at the time of formulating the objectives and the design of the study. Theoretical frames of reference and major orientations of some of the theories in education, sociology, and economics were used as general guidelines for the collection of information and gaining an understanding of it. Such knowledge and orientation actually guided the formation of interview schedules and the design of sampling in this study. Since no major utilization of a particular theory has been made, therefore, no mention will be made of any major contribution from one particular source.

Hence, this study is an effort to make an interdisciplinary approach from an applied point of view. The orientation has been such that it may contribute to a practical program of rural education in Northern Nigeria for the improvement of peasant agriculture.

The study also has limitations in space. The socio-economic, educational, and cultural conditions vary from place to place in micro and macro form within the territorial boundaries of Northern Nigeria. It will not be assumed, therefore, that the findings will be applicable to the whole region. It is, however, hoped that the findings will be

applicable to Hausa-speaking areas of Northern Nigeria out of which the present sample was drawn. For other areas, allowance for micro and/or macro variations will have to be made in efforts to extend the present recommendations and implications.

CHAPTER II

PROCEDURE ADOPTED IN DEVELOPING THE RESEARCH INSTRUMENT AND COLLECTING THE DATA

The quantitative personal-interview techniques were used in order to collect data for this study. However, considerable ground work had to be done in order to gain preliminary legitimization and sanctioning of this method within the religious, political, and local administrative and village framework. Such a process ensured the success of this method and of the study.

Getting Started

The work on this study was started near the end of the year 1961. The writer arrived in Kaduna, the capital of Northern Nigeria, in October 1961. Some time was spent gaining firsthand information about agricultural conditions, rural life in general, and absorbing the "colour locale." An effort was made to locate the relevant written material on Northern Nigerian agriculture and such material was consulted in order to broaden the understanding about rural life problems.[1] Discussions were held with the officials of the Ministry of Agriculture as well

[1]The main sources consulted were H. A. Lunning, An Agro-Socio-Economic Survey of Northern Katsina, Kaduna, Northern Nigeria, Ministry of Agriculture 1961 Underprint, and M. G. Smith, The Economy of Hausa Communities in Northern Zaria (London: Her Majesty's Stationery Office 1955).

as the Ministry of Economic Development to gather more information. Then the author made a visit to the regional agricultural experimental station at Samaru for a week in order to acquaint himself with agricultural research and specific local problems in agriculture. At the experimental station, discussions were held with the specialists in different fields of research. A few visits to the villages near the experimental station were made.

In line with the expressed purpose of the government in requesting this survey and in accordance with the terms of reference of the writer, a preliminary outline proposal for the study was discussed with the officials of the Ministry of Agriculture. The proposal was approved. It included an intensive study of a selected area in one of the main agro-ecological regions of Northern Nigeria. It was hoped that the Government of Northern Nigeria would be able to repeat similar studies later on in other ecological regions of the country, if considered necessary. During the discussions with the officials of the Ministry of Agriculture and in light of the information gathered in the process described above, the original objectives of this study were elaborated, modified, and specified to a great extent.

Selection of the Sample Area

It was decided that the study should be conducted in the Northern Guinea Zone. Northern Guinea Zone comprises the northern half of the Savannah country in Northern Nigeria. An area of about 500 square miles, considered representative of the Northern Guinea Zone, was selected. While selecting this area, full use was made of the experience of local administrators, research workers, and other officials of the Ministry of Agriculture. Both Nigerian and Expatriate Officers were consulted.

The selected area was Makarfi district (an administrative district) of the Emirate (Native Kingdom) of Zaria in Northern Nigeria.

The district is under the charge of a district head, who is a representative of the Emir (native ruler) of Zaria. It includes thirty-two village-areas[2] and a rural population of 81,452. The bulk of the population is of Muslim Hausa-Fulani tribal origin with a few other minority tribes, operationally designated as "Hausa" in this study, because of their assimilation into Hausa culture and way of life. Non-Muslim, animist Hausas, popularly called "Pagans" and cattle-owning, nomadic Fulanis, known as "Bush Fulanis," are other major rural population groups of importance to agriculture. A large number of Muslim farmers maintain their wives within the family compound in varying degrees of seclusion. Unsecluded Muslim and Pagan wives may help their families with farm work involving crops and livestock. Fulani wives have duties connected with the care of cattle and the preparation and sale of dairy products. Almost all women in the villages pursue money-making activities of different kinds. The oldest male member of each extended family is the head of the household (Maigida). He is the chief decision maker and a point of contact for the family. Among the women folk, the senior wife takes precedence (polygamous marriages) over junior wives in decision making on homemaking matters.

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[2]A village-area is a basic unit of administration in Zaria. It is generally composed of a bigger central village as nucleus, surrounded by farming lands in which are located at varying distances from the central village, a varying number of smaller satellite hamlets and interspersed single households usually of cattle-owning nomadic or semi-nomadic people of Fulani tribe. Each village area is administered by a village chief, who rules with the help of a large number of courtiers who are traditional hereditary title holders. The village chief is a client and subordinate of the District Head and, in turn, of the Emir.

There is one main crop growing season, the wet season (June to September), when most of the rainfall (annual average, 44") comes. The rest of the year is very dry and farming during the dry season is limited to valley bottoms, called "Fadamas," where water is usually available. A large number of farmers pursue crafts and do trading during the dry season. The settled farmers pursue a kind of mixed farming.

Legitimization of the Project and Establishing Contact

In early December 1961, on arrival at Zaria, the field headquarters for the study, the author was introduced to the Resident (the administrative head) and the Emir (the native ruler)-in-Council. The purpose and details of the survey were explained to them and their approval obtained. The author was then introduced to the District Head (administrator) of the selected area. The District Head introduced the author to the village heads and asked them to cooperate with him. The author, on three occasions, spoke to gatherings of village heads in Makarfi district (the selected area) in the presence of the District Head and of the Emir. The Emir and the District Head were asked to assure the village heads that this study would not bring any tax increase or any other ill effect on their people, but on the contrary that it might help the villagers. Several villages were visited in order to become familiar with the area. Village groups were addressed on the purposes of the survey and the procedure to be followed. They were assured time and again against any harmful implication of the study.

The legitimization process described above helped in building public relations, which contributed to the smooth-running of the study.

Assurances from their own rulers and traditional leaders about the intentions of the study helped to build confidence in the minds of the village people. In a study like this, where the data have to come from the people, it is very important that the people are clear about the purpose of the research, so that they lend their willing cooperation. This problem is quite difficult to tackle in countries where the level of literacy is low, people are not used to such inquiries, past experiences with outsiders are not very pleasant, and every newcomer in the village is a suspect.

First Phase of Data Collection

In order to gain further rapport with the village people and also in order to acquire some general knowledge about the selected area, visits were made to the village with two Nigerian counterparts.[3] The headquarters of each rural community (the central bigger villages) was visited. The villagers were collected near the village head's house and the objectives of the study were explained to them. During the same visit some general information about each community on the subjects of agriculture, social organization, education, and communications was collected on a small schedule prepared for this purpose.[4] The questions were asked from the village head as the key-informant in the presence of other villagers. In this way some very important community level information was collected from all 32 village-areas in Makarfi district. Apart from having its own value, this information later helped in the

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[3]Mallam Ahmadu Rufai Kano, Assistant Agricultural Superintendent, and Mallam Dauda Tagwai, Agricultural Instructor, both of the Ministry of Agriculture, Northern Nigeria.

[4]See Appendix I, page 218 below.

selection of the sample villages as well as individual farmers in the sample.

Second Phase of Data Collection

Towards the end of January 1962, the Home Economist member[5] of the FAO team arrived. It was decided that the Home Economist should also work in the same area and coordinate with the author in planning and conducting personal interviews with a representative sample of 100 families in the selected area. This was also desirable from the point of view of collection of reliable data. A previous researcher,[6] working in a similar area of Northern Nigeria experienced great difficulty in collecting reliable information by interviewing male members of the rural communities only. After considerable work he found that the data he had been collecting from the male members were not reliable. He had to enlist the help of his wife, who could visit the farm women inside the compounds and collect similar data from them for rechecking. (It is not possible for men interviewers to ask questions from women in a Muslim society.) Realizing the importance of cross-checking the information, the present study was coordinated with the Home Economist at the data collection stage.

Formulation of the Instruments of Observation

In line with the purposes of the survey, more background information was gained through consultation of the available literature.

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[5] Dr. Helen C. Abell, at present Professor of Sociology, Extension Education Department, Ontario Agricultural College, Guelph, Ontario, Canada.

[6] M. G. Smith, as reported in The Economy of Hausa Communities of Northern Zaria (London: Her Majesty's Stationery Office 1955).

District Administrative Note Books as well as District Agricultural Note Books proved a useful source of information on local conditions in general and agricultural conditions in particular.[7] Discussions were held with the local officials of the Ministry of Agriculture. Representatives of the different Ministeries concerned with related aspects of rural life were also consulted at the Provincial level. Personnel of the United States Operations Mission helping and advising the government of Northern Nigeria on Agricultural Extension, Agricultural Information and Communications were also consulted.

Experience gained from previous work in the area of the study and consultations with the Nigerian counterparts, accompanied by further personal observations in the field, were some other sources of information and understanding. Ideas and suggestions from all these sources resulted in the formulation of two sets of interview schedules; one to be used with the male heads of the households[8] and one to be used with the senior wives of these men. The male heads of the households were the unit of analysis in this study.

Design of the Interview Schedule

The principal research tool used in this study was an interview schedule. "Schedule is the name usually applied to a set of questions

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[7]In Northern Nigeria District Administrative Note Books and District Agricultural Note Books, which are usually written by the District officers and Agricultural officers respectively, are available for many areas. The nature of the information included is usually general gazetteer type. A copy of the Agricultural Note Books is also available at the Regional Office of the Ministry of Agriculture, Kaduna.

[8]The interview schedule used for male family heads is given in Appendix II.

which are asked and filled in by an interviewer in a face-to-face situation."[9] The process of designing the schedule for individual respondents continued over a considerable time. A list of items on which data were required was prepared in line with the major objectives of the study. The initial outline prepared by the author and agreed to by the Ministry of Agriculture was also used as a guide to prepare the list of items. Questions were then worded so as to get information about each item in the list. Since the objectives of the study required information on a large number of items, the interview schedule was rather long. The following types of structured and unstructured questions were included in the schedule. Among the structured questions were included fill-in type, dichotomous type, and multiple-choice questions. Open-end type questions were the only unstructured ones used in this schedule.

1. Fill-in. Fill-in types of questions were used in a large quantity in the schedule. These questions collected information on personal characteristics as well as the characteristics of the families of the respondents. Most of the data about farming, livestock, and information of economic nature were collected by this type of question. A typical example of these questions is given below:

> What languages do you speak?_____
>
> How many of the men or boys living in this compound now help you on the farm?_____

2. Dichotomous. Dichotomous questions were asked only where definitely positive or negative response was expected. An example of such

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[9] William J. Good and Paul K. Hatt, Methods in Social Research (New York: McGraw-Hill Book Company, Inc., 1952), p. 133.

question is as follows:

Do you practice Kulle? yes_____ no_____

Sometimes such questions were used as a lead to another question. For example:

Are you a native of this village? yes_____ no_____
If No, where else do you come from?_____

3. Multiple-choice questions. Multiple-choice questions were used on a large scale in this schedule. These questions were only used where the possible choices were known and only a specification was required as to which of the choices was applicable. An example of this type of question from the schedule is given below:

In this household who does the following things? (check)

	Maigida	Wife	Children or grandchildren		Other adults (specify)		Other children (specify)	
			male	female	male	female	male	female
Clearing the bush								
Burning the bush								

4. Open-end questions. In spite of the fact that open-end questions are very difficult to code, a large number of them was used in this study. Being unstructured, they yield some very useful data and may open new dimensions in the inquiry. This type of question was used when it was desirable to encourage the respondents to answer using their own terms and frames of reference and in cases where responses could not be anticipated. An example of such questions is the following one:

How do you prepare the Rumbu for storage? _____

_____

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Do you practice Kulle? yes_____ no_____

Sometimes such questions were used as a lead to another question. For example:

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_____

Arrangement and Sequence of Questions

The interview schedule used for male respondents was roughly divided into three parts. The first part contained information about personal characteristics of the respondents and their families. This part also contained the views of the male heads of the household about the jobs performed by the family women. The second part of this schedule contained information regarding farming and livestock. The third part of the schedule contained information about the diffusion of the use of superphosphate fertilizer in the area. This was the general format of the schedule.

A feature of the physical construction of the schedule was that some questions were repeated in other sections of the schedule in order to cross-check the information from the respondent when he was unaware of it. Another major characteristic of the schedule was that the same questions were repeated and included in men's and women's interview schedule, so that the information could be checked from both sides of the family.

Phrasing the Questions

Since the writer did not know the language of the farmers to be interviewed, the preparation of the interview schedule and phrasing of the questions was a great challenge. Of particular difficulty was the task of writing the questions in words which would communicate to the respondents the exact meaning of what the researcher wanted. To overcome this difficulty the help of several individuals, mainly those working for the Ministry of Agriculture, was utilized. The questions were written in English by the writer, and the local helpers were asked to go

over them and explain what the questions meant to them and might mean to the farmers. In this way the wording of the questions and their phrasing was changed, modified, and rewritten in order to elicit the required type of response. Knowledge of local language and local culture is an important asset in such situations. The questions must be asked in a way which is polite and does not arouse feelings of hostility in the respondent. An example is given from the present schedule. On page two of the interview schedule, the information was required on family members of each of the heads of the households interviewed. In the first instance this question was written in this fashion: "How many members are there in your family?" When the opinion of local Hausa-speaking Nigerians was taken on this question, their first objection was that it is not very polite in Hausa culture to ask a person directly about the number of people in his family. The question must be asked in a very polite manner. The second objection that they had was about the definition of the "family." The Hausa word equivalent to the word family is ambiguous. It may mean extended family or kinship unit rather than the immediate family of the respondent on which the information in this study was required. On the advice of these judges the question was rephrased as follows: "How many people do you feed?" Many other questions were rephrased similarly. For the sake of convenience of the interviewers, some local terms were used in the schedule which conveyed the exact meaning of English words in the questions.

Pre-testing the Interview Schedule

The final copies of the interview schedules were taken to the villages and interviews on them were conducted for the purpose of pre-

testing. Very few changes of a minor nature were required on these schedules for finalization. These changes were made in the final mimeographed form. The pre-test schedules were later used as regular records and were included in the study after correcting the information where changes were required.

Training of Interviewers

Two Nigerian counterparts mentioned in the preceding pages were the only two interviewers who interviewed 100 family heads in this study. The Home Economist was helped by two Nigerian women. All four of them were involved in the formulation of the study and the design of the interview schedules from the beginning. At every step they were informed about the purpose of the study in general and of the questions to be asked in particular. Their help was taken in the design of schedules and wording of questions. By the time the schedules were completed they were quite familiar with the type of responses required. Pre-testing of interview schedules was another means of training them. In addition to this, almost all the interviews in this study were personally supervised and checked by the writer, and the interviewers were helped on the spot wherever necessary.

Sampling Method and Involvement of Local People

Knowledge gained from visits to the villages and data on the preliminary village survey schedules indicated that some villages in Makarfi district were markedly different from others. The villages situated on the roadside or rail heads had an advantage in terms of communication, transport, and contact with the outside world which the villages in the deep bush did not have. These differences seemed to

affect all aspects of rural life. A villager in a remote village has less chances to visit bigger population centres, learn and be exposed to new things in life. He has less facilities and chances for education. In general the villages farthest from rail heads and passage roads are smallest and mobility is correspondingly difficult. Von Thunon's principle seemed to operate on economic production. A village with a difficult approach offered certain disadvantages in agricultural production.

Six villages of the Makarfi district seemed to have these extraordinary advantages. They all had either a railway station or bus stops. All six villages had big markets. They contained all of the five schools in the area. All had a groundnut (peanut) buying point. Three of these five villages had cotton markets and cotton seed stores. Two had the only post offices and two had the only dispensaries in the area. Four of them were the biggest population centres in the district. People from other surrounding villages visited these six villages quite often. These six villages were classified as "the main points of contact" and were grouped into one category.

From these "point of contact" villages, the distances to the other twenty-six villages in the district were marked on a map. All villages were then stratified according to their distance from these "point of contact" villages. The distribution of these three strata of villages, the number of villages per strata that were sampled, and the number of interviews conducted were as follows:

TABLE 1

DISTRIBUTION OF INTERVIEWS BY CATEGORY OF VILLAGES

Category of Village	Villages in District	Villages in Sample	Male Interviews
A. ("Points of Contact")	6	3	20
B. (4 miles or less from A)	13	5	40
C. (4.1 to 6 miles from A)	13	6	40
Total	32	14	100

The number of sample villages was 14 of the 32 total villages in the area of study. These 14 villages were selected at random. The selection of the respondents was made from each category of villages on the basis of percentage of villages in each category.

Five of these fourteen villages could be readily reached with a four-wheeled vehicle (a Land-Rover) on a usable mud road. Five villages could be reached by Land-Rover with some difficulty driving through bush and farmlands. The remaining four villages could not be reached by Land-Rover. They were arrived at by bicycle and by motor-bicycle.

After selecting the sample villages, the District Head of Makarfi (Native Administrator of the area) was visited once more and fully informed of the method by which the sample villages had been selected. He cooperated fully by sending messages to the respective heads of each of the fourteen selected villages informing them again about the study and asking for their cooperation with the survey team. The team kept in close touch with him all during field work.

The sample of one hundred families allowed for tribal composition. Eighty of these hundred families were settled Muslim farmers. Ten families were Pagan non-Muslim settled farmers, and the remaining ten were nomadic cattle-owning Muslim Fulanis. The sample also allowed for ten men of the hundred to be holders of political positions; ten men to be active traders in addition to being farmers, and eighty to be primarily engaged in farming.

In each sample village, before the selection of individual respondents, the village people were fully informed of the purpose of the survey. They were asked to supply a list of the male members of the village. From the village tax records, political title holders, active traders, cattle-owning Fulanis, and Pagans were marked out separately.

TABLE 2

ONE HUNDRED SAMPLE FARMERS SHOWN ACCORDING TO TRIBAL AND SOCIO-ECONOMIC STRATIFICATION

Socio-economic Stratification	Tribal Stratification			
	Settled Muslim "Hausa"	Cattle Fulani	Pagan	Total
Political title holders	10	--	--	10
Active traders	10	--	--	10
Other farmers	60	10	10	80
Total	80	10	10	100

From each of these categories the required number of respondents were selected at random usually by preparing numbered slips and asking the village heads, Liman (religious head in the village), or any other respected villagers to draw the numbered slips to determine the person to

be interviewed. The remaining respondents were usually selected from village tax records by selecting the page of the tax book at random and from there starting with a random number again. The villagers were asked to participate by calling numbers at random which would determine the selection of the page and respondent on that page. This process was carried on in the open air in the midst of the villagers and convinced the village head and his people that it was chance alone which governed the selection of any individual respondent. After the actual sample names had been drawn, the village head was asked to inform each of the selected respondents about the study and to arrange for the man and his wife to be available for interviewing on a set date.

Thus, these hundred men selected in this sample were considered to be representative of the rural population living in the study area.

Methods of Administering the Interview Schedules

It has already been mentioned that two separate schedules for use with men and women were designed. The schedules were administered separately to the head of the household (Maigida) and to his senior wife (Uwargida). The first seven pages of the schedule were identical. The interviews were started with the head of the household either in his own outer hut (Zaure) or in a place specified by the village head. Before the start of an interview, the respondent was informed about the purpose of the study. The importance of giving accurate information was impressed upon him and his wife.

On the first seven pages of each separate schedule the male and female interviewers recorded the answers of the man being interviewed.

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On the first seven pages of each separate schedule the male and female interviewers recorded the answers of the man being interviewed.

Then the female interviewers were escorted to the man's compound where it was possible to validate these particular answers of the husband in terms of the answers given by his senior wife. The remaining pages of the male and female schedules were completely different in subject matter following this first series of questions.

This procedure of checking certain information from both sexes in the family was adopted to permit cross-checking and to insure accuracy and consistency of responses on matters affecting not only the male head of the family and his senior wife but also other members of the household. The answers on the first seven pages of men's schedules and women's schedules were compared at the end of the interview to check for discrepancies. As has been pointed out, another device to ensure the accuracy of information was to repeat the same question in different forms at different places in the interview schedules.

The interviews were conducted in Hausa language and the responses recorded in English on the schedules. The interviews with men lasted from two to three hours, which necessitated rest periods and time out for daily prayers for the respondents as well as for the interviewers.

In addition to interview schedules, personal notes on observation and informal talks with the farmers, Nigerian counterparts, as well as with the officials of the Ministry of Agriculture, added to the bulk of the data collected. A regular diary was maintained by the author and points and things significant to this study were recorded.

Interviews were usually conducted on Monday, Tuesday, Thursday, and Friday. On Wednesday and Saturday, the respondents for the next two working days were selected and the respondents informed.

Working days were usually long, starting from 7:30 a. m. to late in the evening. Fourteen hour days were necessary to complete the interviewing before the rainy season made travelling impossible. The days involved travel on mud roads by motor car and frequently also by bicycle or motor bicycle in order to conduct the interviews. Such long days necessitated rest periods for the local staff. As the study progressed, both female interviewers and one male interviewer, in turn, were given Wednesdays and Saturdays off for a rest. Each male interviewer conducted two interviews in a working day. Thus, an average of four interviews were completed on each working day. It took twenty-five working days to complete the 100 records. The field work lasted from February 13 to April 6, 1962.

Analysis of the Data

The records were brought to the office at Zaria headquarters. Data on the schedules were coded and the codes were listed on 80 x 40 listing sheets prepared locally on the back of fertiliser posters being issued by the local Ministry of Agriculture. The counting of the codes was done manually and the counts were recorded opposite each item in the codes. From these counts analysis of the data proceeded. Re-counting was usually done for cross-break analysis.

Simple statistical techniques have been used in the analysis and presentation work. Use of the measures of central tendency such as mean, mode, and median has been made in presenting the data. Simple correlations have been worked out where necessary to show the relationship between the facts. Figures have been shown in percentages.

In the analysis and presentation of facts, census type data were

also used where necessary. Such data were taken from the census bulletins of the Federal Department of Census. Previous researches, where available and applicable, were used in order to support or reject the relationships or implications.

Validity and Reliability

The value and significance of a study, in the final analysis, depends upon the dependability of information presented in that study. If the data are undependable, the usefulness of the study is greatly impaired because undependable information can be misleading. This is particularly true of studies which mean to set up implications or hypotheses for action programs, like the present study.

The preceding pages have presented details about the procedure adopted in collecting the data. Also included are the procedures adopted in the preparation of the principal research instrument. An examination of these pages will indicate that all efforts were made to achieve the highest degree of objectivity in the methods of data collection. There are, however, two questions which must be asked in determining the dependability of the research procedure. The first of these is whether the research instrument and procedure really measured what they were supposed to measure? The second question is how reliable the data are?

In relation to validity of data, it should be clear from the discussions on the preceding pages that every effort was made while designing the interview schedule to convey the exact meaning of the questions to the respondents in order to evoke valid responses. An examination of the pertinent facts about the procedure used in collection of data,

wording the questions and pre-testing of the schedules should give satisfactory evidence of the validity of the research procedure. For example, the methods of interviewing involved the cross-checking of information from both sexes in the family. Such a procedure allowed for finding out the inaccuracies in the data on the spot, which could be corrected. The check of responses by changing the wording of the questions at different places also helped to validate the information and answers. It would have been helpful to indicate the correlations between the first responses and the second corrected responses. Since wrong or doubtful responses were erased at the spot in order to insert the corrected responses, no records were kept for both the responses. Hence no data is available to show the correlations.

Reliability of a study is related to the degree of consistency with which it measures what ever it is measuring.[10] A discussion of the methods of selection of sample indicates that steps were taken in order to comply with the basic requirements of the sampling methods. As far as possible the factors of adequacy and representativeness were kept in view while selecting the sample. However, the selection of the area was not made on a random basis. It was selected on the basis of judgment of the local administrators. Because of the lack of available recorded data and because of the hetereogenous nature of the rural life in the country, it was not possible to find out beforehand how far the area is representative of the Northern Guinea Zone. The experience and travel by the writer through the country, however, guarantees the fact

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[10]James O. Wert, Charles O. Neidt, and J. Stanley Ahmann, Statistical Methods in Educational and Psychological Research (New York: Appleton-Century-Crofts, Inc., 1954), p. 328.

that the selected area is quite similar to Hausa-speaking areas of Northern Guinea Zone of which the sample was selected.

In relation to the selection of 100 farmers, the question can be asked: how far is this sample representative of the peasantry of Makarfi district? There is no other source of data from which the similarity of this sample to the population can be judged. The stratification of the sample allowed for the inclusion of different socio-economic, political, and tribal groups in the area.[11] The individual farmers were selected on a random basis. This indicates that the population of Makarfi district has been very well sampled and this sample of 100 farmers is representative of the farmers of Makarfi district. As far as the adequacy of the sample is concerned, considering the resources available and the conditions of travel and work, it can be said that for an infinite population, a sample of 100 farmers is enough, since the sample has been stratified and selected at random. However, there is no doubt that a bigger sample than the present would have given a much wider degree of responses. The present sample gives a fair degree of representativeness and it is hoped that if the same study is repeated on a randomly selected sample of farmers in this area the results will be close.

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[11]The stratification of the sample on socio-economic, political, and tribal basis has left the number of cases in some strata quite small. During analysis the differences in some of the internal comparisons will be found slight and the number of cases in some cells will be small. The fact that in each of the comparisons of different strata the difference is usually in the same direction suggests that the results have some validity.

CHAPTER III

PHYSICAL SETTING AND HUMAN RESOURCES IN THE AREA STUDIED

Physical Setting

Makarfi district (the area studied) is located in the northern-most part of Zaria Province. It is situated between 11. 10° N and 11. 30° N Latitude and between 7. 40° E to 8. 05° E Longitude. It shares its northern boundary with Kano and Katsina Provinces. On the eastern, southern, and western sides are located, respectively, Ikara, Soba, Zaria Sabon/Gari, and Giwa districts of Zaria Province in Northern Nigeria.

The area is roughly of a rectangular shape, the larger sides of the rectangle facing towards North-East and South-West. The rough average length of the area is about 27 miles North-East South-West, and the breadth is about 18 miles. The total area has been estimated as 490 square miles.

The topography of Makarfi district is characterized by the open rolling country consisting of uplands which gently slope into low lying streams and marshes, making broad and shallow valleys called "Fadamas." Rocky outcrops of granite occur at intervals throughout the district. The elevation of the area varies from 2,100 to 2200 feet above sea level.

Soils

Generally speaking, the soils of this area belong to the great soils group of "Savannah Ochrosols and Associated Lithosols with some grey neutral Gleisols."[1] An intensive soil survey of this area has never been conducted; therefore, information available is limited and of very general nature.

Higgons and Tomlinson[2] include Makarfi district into the soils of Loess Plains Unit group "where the surface is largely covered by a deposit of Loess laid down on a basement complex with residual iron pan. The Loess has been deposited on an underlying material which is rather irregular, hence the depth of this group of soils varies considerably." The soils of the area are of two general types. The upland soils which have been described as generally fine Sandy loams of varying depths and colour. They have a tendency to make a hard pan on the surface during rains, thus impairing drainage. General level of fertility of these soils is low.

The low lands, called "fadamas" seem to have developed either from alluvially resorted material or are deep aeolion drift soils. They usually have a heavier texture of varying colours, which ranges from deep red loams and reddish brown loams to clays. The drainage is usually impeded and level of fertility is higher than the upland soils. The ratio of fad ama to upland farms varies from village to village and is generally quite low.

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[1] Agricultural Survey of Northern Region of Nigeria Report by FAO/ICA team, Kaduna, Nigeria, December, 1960.

[2] G. M. Higgons and P. R. Tomlinson, Soils of the Western Middle Belt in Northern Nigeria (unpublished paper), 1962.

Climate[3]

Makarfi district experiences two distinct seasons during the year. The wet season, the summer months from the end of May to the middle of September, brings rain through south-west Monsoons from the Gulf of Guinea. This is the main crops season for upland farming. There is an intense activity on the farms during this season.

The long dry season is prevalent from October to the beginning of May. Agricultural activity during this season is usually restricted to harvesting of crops grown during the wet season, preparation for the next season, and cultivation of fadama lands. During this period north-east trade winds, laden with dust from Sahara, blow across this part of Nigeria. These winds are known as "Harmattan." Harmattan is the supposed carrier of Cerebro-spinal Meningitis.

The mean annual rainfall at Samaru Agricultural Station (about six miles from the south-western tip of Makarfi district) for the last 38 years (1924-61) was 43.86 inches. The study of rainfall data shows that there is a great deal of variation in year to year rainfall. Most of the rainfall comes from May to September. The months of November to March had an annual mean rainfall of less than one inch during the last 38 years. Another feature of the rainfall is its local variation. As a rule, the total rainfall decreases as one goes north, but there is a considerable local variation in precipitation from one place to another during a particular time of the year. Upland farms depend on this rainfall for moisture requirements and it is against this background of uncertain rainfall that farmers operate for their cash and food crops.

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[3]Data on rainfall, temperatures, and humidity taken from Samaru Agricultural Research Station through personal communication from Secretary Research and Specialist Services vide No. MA/6/328 of 18/6/62.

Temperature records from Samaru Agricultural Station show that the differences between mean monthly temperatures around the year are comparatively small. March, April, and May had the highest mean temperatures (range 81.4° F to 96.9° F) and are thus the hottest months in the year. December and January had the lowest mean temperatures (range 57.5° F to 75.8° F), thus they are the coolest months in the year.

Relative humidity figures indicate that the humidity begins to fall after the rains. December, January, February, and March are the dryest months in the year (range 16.3% to 34.1%). Immediately before the rains the humidity begins to build up with the most humid months as June, July, August, and September (range 59.1% to 88.0%).

Vegetation

Makarfi district is a part of the Northern Guinea Zone, and the vegetation found in this area conforms in characteristics to the vegetation of that zone. The country can be described as open woodland savannah or orchard bush. The uncultivated areas are covered by grasses. The grasses are used by the native population for grazing and as fodder, thatching of roofs and fences, and for making of zana mats. The extent of grass cover in the district varies from place to place and, among other things, depends upon the human and livestock population, nature of the soil, topography, and management practices followed.

Uncultivated lands are further characterized by the presence of smaller shrubs of various species popularly known as "Bush." The extent of bush and population density of the plants depend, among other things, on the number of years since the land has been fallow.

Trees of varying ages and sizes are found almost all over the district interspersed in bush and farm lands. As a rule, new trees are not deliberately planted by the farmers on the farms, but the young trees are protected for growth when desired. Inside the compounds trees are planted for shade, fruit, and leaves. The trees of economic importance are protected by the rural people for the purpose of gathering fruit, leaves and bark, and for shade, timber, and fuel wood. Among the trees found in this area, the following trees are of economic value to the rural people: Locust Bean Tree (Parkia Filikodea), Shea Butter Tree (Butyrospermum Parkii), Tamarid (Tamaridus Indica), Boabab Tree (Adensonia Digitata), Silk Cotton Tree (Ceiba Pentendra), Mango (Mangifera Indica), Delab Palm (Hypaeve Thebacca), Henna (Lawsonia Inermis Linn).

Because of the intensive cultivation of land, the natural vegetation in Makarfi has been modified over a period of years. The present situation more or less agrees with the pattern described by Keay[4] for Northern Guinea Zone vegetation. Immediately around the larger villages in Makarfi district, natural vegetation has been destroyed because of the continuous cultivation of land, except for farm trees. Beyond the regularly cultivated areas there is usually an irregular circle of alternately cultivated and grazed land. Because of shifting cultivation, grazing, and fires, the scrub regrowth in this land never gets a chance for fuller development. Most of the bush areas of Makarfi belong to this group.

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[4]R. W. J. Keay, An Outline of Nigerian Vegetation (Federal Department of Forestry Research, Lagos, 1959), p. 27.

Water Supplies

The water requirements for crop growing are fulfilled by natural precipitation during the rainy season. The rain water is utilized both on upland and fadama farms. During the dry season, the only water available for cultivation of crops is in the streams. This water is lifted mainly by means of shadoofs, buckets, and calabashes, and irrigation is performed by surface flow or by hand.

Water requirements for fulani cattle are fulfilled from the streams and depressions during rainy season and from fadama streams during the dry season. In the years of normal rainfall, water supply for cattle is usually sufficient throughout the year. Water for other livestock, such as goats, sheep, horses, and donkeys, is taken from streams as well as from wells.

Water for human consumption is usually obtained from the wells, either inside or outside the compounds. A few families living outside the villages use streams as sources of drinking water. Subsoil water table varies from place to place in the district and during the wet and dry seasons.

Roads and Transport

Makarfi district is more fortunate in terms of communications than other similar areas in Northern Nigeria. Dry season road (now being paved) from Zaria to Kano passes through the western length of the district. The road, even when not paved, had been fairly good during the dry season. Most of the sugar cane grown in this district is transported to Kano and Zaria and other places via this road, as is the case with onions and potatoes, which are usually transported to southern parts of the country. Three big villages of the district, Hunkuyi,

Kudan, and Makarfi, are situated on the road.

A mud road connects Ikara, a nearby district, with this dry season road to Kano at Makarfi village. Gimi and Gubuci, two large villages of Makarfi, are located on this road. Both of them have general and cotton markets. Leading from these roads are small feeder roads reaching some of the villages in the district. During the dry season more villages can be approached with a strong vehicle than during the wet season.

Zaria to Kano railway line traverses through the eastern length of the district. Likoro and Gimi are the two railway stations which serve the Makarfi district. Both of these villages contain the only two post offices in the district.

Thirteen of the 32 villages (42%) in the district can be approached either by road or by rail during the wet season. The population of these villages forms 58.68% of total population of the district. Dry season figures for similar accessibility (though with difficulty) are 18 of the villages and 72.59% of the total population. The rest of the villages have no motorable roads at all and have to be approached either by foot, bicycle, or donkey.

Implications for an Action Program

A study of the ecological conditions in the area indicates the general framework within which an action program for the improvement of farm production and levels of living has to work. The rainfall data shows that farmers are very busy during the short rainy season. Under the circumstances, one will not expect that farmers can be contacted during this period in the villages in larger groups. The extension agents

will have to rely on on-the-spot teaching in the fields through practical method and result demonstrations either on the single family basis or on the small group basis.

During the dry season the farmers in this area are not so busy. They can be found in the villages in larger groups. More formalized teaching situations can be organized during this period with the help of various teaching aids. Training of agricultural leaders and progressive farmers in out-of-the-village situations such as government agricultural farms and experimental stations can be carried out. The dry season will also be an excellent period for conducting in-service training of the extension agents, because of very little activity on the farms. During this period planning and arrangement for the farm supplies can be made by the extension staff for distribution during the next crop season.

The marked seasonality of rainfall divides the agriculture of Makarfi district into two types. Upland farms are cultivated only during the rainy season and fadama farms are usually cultivated during the dry season. This has implications on the teaching of the subject matter during different periods of the year. The present ecological conditions also point out some needed areas of teaching activities which can be undertaken. Cultivation of vegetables in fadamas, soil conservation and tree plantations should be some of the important programs.

Rural roads and transport conditions in the rural areas set some limits on the effectiveness of extension workers. Many villages can not be visited during the rainy season without a lot of effort and, therefore, must be visited intensively during the dry season. In such villages the agricultural requisites such as seeds, fertilizers, etc. must arrive before the start of the rainy season. The agricultural agents can arouse the interest of villagers in such villages to take up road

improvement projects. During the rainy season the extension agents should concentrate their efforts on the roadside or easily accessible villages with good chances and resources for improvement.

Human Resources in the Area of Study

The rural people are the main focus of attention for extension workers all over the world. A thorough knowledge of the characteristics and composition of rural people on the part of extension workers is an absolute necessity which can hardly be over-emphasized.

Patterns of Settlement

The first step to an understanding of rural people is a knowledge of their location. A study of the rural patterns of settlement can give such information. In Makarfi district there are no urban centers and all the people living in this area can be classified as rural. Zaria town is about 15 miles from the southern tip of the area, and it has influenced some villages. This fact has been well taken care of while sampling the villages. The following are three major patterns of settlement in Makarfi district:

1. The bigger agricultural villages of various sizes, called Kauye in Hausa language, are in the center and serve as nuclei of the rural communities. There are 32 such villages in the area. These villages are inhabited by Muslim settled farmers. These farmers are originally of various tribal origins such as Hausa, Fulani, Kanuris, etc., but at present they are assimilated into Hausa culture and way of life. In this study they have been designated as "Hausa." These villages usually have facilities for various kinds of services, provisions and marketing. They are better connected

with the outside world. Craftsmen who process the raw material and provide goods and services to the local population live in these villages. In the olden days these villages provided protection against outside incursions and most of them had walls around them. Village area chiefs live in these villages.

2. Around these nuclei villages are located smaller units of settlement called Unguwa in Hausa. These satellite units are scattered at varying distances from the nuclear villages and are of varying sizes. These hamlets are usually not self sufficient in their needs and they have to depend upon the bigger villages for various goods and services. The population in these hamlets is usually composed of an extended family group who trace their origin to the nuclear village. These hamlets (Unguwoyi) are of much younger age than the villages (Kauyuka). At one time in the recent history these people moved out of the nuclear village to be near their land.
3. The third form of settlement found in Makarfi district is of scattered households on the land. It is usually composed of one or more nuclear families scattered between the hamlets or in the bush. Some settled rural families move out of the villages or hamlets to be near their farms. Most cow fulanis who graze the area throughout the year make temporary or semi-permanent dwellings in the bush and are found in this type of settlement.

Statistics are not available to show what percentage of rural people live in larger villages and what percentage live in smaller settlement units. Thirty-three per cent of the respondents in a random sample in this study lived outside the main villages. Luning in Northern Katsina found 33 per cent and 42.7 per cent of the people living in the

hamlets in two villages.[5] It has been noticed that all cow-owning fulanis and all Maguzawa (Pagan) in this area live in smaller settlement units. Fulanis by the nature of their profession and Maguzawa most probably because of their religious practices, which differ from the predominant Muslim population.

Implications for an Educational Program

The division of rural population into bigger villages and smaller scattered settlement units has a very important aspect from the point of view of introducing new ideas and practices. The people living outside the main villages are in a comparative state of isolation because of their location. Most of the communications coming from outside usually end up in the central bigger villages. The officials connected with the agencies engaged to bring about changes in rural life patterns visit the bigger villages only. This is because of comparative ease in approaching the bigger villages as well as the fact that the bigger villages are the centers of political as well as administrative activities. The central villages are the seat for rural government because of the residence of the village head. The variable of isolation bears out in the later findings of this study.

On the other hand, a cursory analysis of data presented in the following chapters indicates a general difference in the pattern of activities followed by the rural people in the central villages and people living outside the central villages. Farmers living in the smaller settlement units reported having followed activities mainly connected with land, plants, and animals. A comparatively larger proportion of people

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[5] H. A. Luning, Agro-Economic Survey in Northern Katsina (Kaduna, Northern Nigeria, Ministry of Agriculture, underprint, 1961), pp. 9-12.

living in the central villages pursue additional crafts and professions, such as trading, as compared to people living outside the central villages. Being predominantly agricultural, the people living outside the central villages are actually a better clientele for extension work.

The People

The total population of Makarfi district, according to the 1952 census, was 59,231. The advance figures of the 1962 population census for this district indicate a total population of 81,452, with a net increase of 22,221 persons. The average annual rate of increase for the last ten years comes to about 3.75 per cent. Corresponding figures for other provinces and for the whole of Northern Region are not yet available for the 1962 census. According to advance figures, the average annual rate of increase for the period 1952-1962 in rural areas of Zaria province is 3.37 per cent which compares favorably with the rate of increase in Makarfi.

The net rate of increase mentioned above is much higher than the anticipated average annual rate of increase of 2 per cent. There could be several reasons for this. One likely reason is that the figures of present census are more accurate and complete than the last census. The other reason possibly is migration, both temporary and permanent, at the time of the 1962 census. The third reason, of course, is the natural growth. It is difficult to analyze the actual rate of growth of population and attribute it to the specific reasons without definite data at hand.

Density of Population[6]

TABLE 3

DENSITY OF POPULATION IN MAKARFI DISTRICT AS COMPARED TO SOME OTHER AREAS IN NIGERIA

Name of the area	No. of people per square mile
Makarfi District	121
Zaria Province	49
Katsina Province	157
Kano Province	204
Other Northern Provinces[7]	54
Riverain Provinces[8]	41
Northern Nigeria	60

It is clear from the above table that Makarfi district is more denssly populated than Zaria province taken as a whole. The average density of population in all other provinces in Northern Nigeria is much lower than Makarfi except Kano and Katsina provinces. Makarfi and Ikara districts of Zaria province are the northern-most and become a part of high density Kano and Katsina area.

Trends in Rural Urban Population in Northern Nigeria

In the absence of reliable and consistent statistics it is difficult to analyze the rural and urban trends in population movements. As has

[6]The figures are based on 1952 census.

[7]Includes Sokoto, Bornu, Bauchi--the figures shown are average density per square mile.

[8]The figure is an average of density per square mile for Plateau, Niger, Ilorin, Kaba, Benue, and Admawa provinces.

been the case everywhere, it appears that there is some migration of rural people to the towns and cities. With the increase in industrialisation and urbanization, this movement will be further accelerated. The present movement to cities and towns in the northern provinces is primarily of rural males of the younger age group, with more formal education, who migrate to cities in search of jobs and better opportunities for life. Very few rural women from Muslim Hausa communities in the northern provinces are moving to the towns unless accompanied by their husbands. The rate of movement at present is too low to be of any real significance. Nevertheless, it indicates the trend.

In more southern parts of the Northern Region, where education in rural areas is common and a considerable proportion of the population is of the Christian faith, both males and females of the younger age groups are moving out of the smaller villages to towns and cities after job opportunities.

Tribal Composition of Rural Population in Makarfi

Makarfi district is inhabited by people from a large number of ethnic backgrounds.

For the purpose of analysis the figures in Table 4 (see following page) do not give much guidance. Most of the Kanuris mentioned therein are migrants from Bornu. It has been observed in the villages that most of them have been assimilated into Hausa culture and way of life through residence and intermarriage. Of 10,940 Fulanis in the area, many are settled Fulanis who also have acquired Hausa ways of life. Three thousand five hundred sixty-five cow-owning wandering Fulani, however, remain a separate cultural group.

TABLE 4

TRIBAL COMPOSITION IN MAKARFI[9]

Tribe	Number	Total percentage
Hausa	45,071	76.0
Fulani	10,940	18.5
Kanuri	2,343	4.0
Nupe	230	.3
All other tribes[10]	647	1.2

In the above figures for Hausa population are included two groups of Hausas: (a) Muslim Hausa, and (b) Hausa people who practice animism. The latter are called Maguzawa. The usual rate of interaction of the settled people with the Maguzawa and cattle Fulanis is low. Hence Fulanis and Maguzawa can be said to form cultural islands.

In 1952 census reports there are many other tribes reported living in this area. Their individual numbers are not big enough to be of any significant agricultural importance. From an agricultural point of view, cattle Fulanis, Maguzawa, and settled Muslim farmers are of major importance.

Fertility Ratio

A good measure of assessing the rate of reproduction of farm population is through the computation of fertility ratio. The population

[9]Population Census of the Northern Region of Nigeria 1952, Bulletin No. 4 Zaria Province, published by Census Superintendent, Lagos, 12 pp.

[10]Includes Ibo, Yoruba, Edo, Gwari, Jaba, Kadara, Katab, other Northern tribes, other Nigerian tribes, non-Nigerians.

census of Northern Nigeria of 1952 shows that the fertility ratio for Makarfi district is 1061. When a comparison of the fertility ratio for different areas is made in Northern Nigeria it is found that there is a negative relationship between the density per square mile of population and the fertility ratio. A comparison of the rural and urban production rates shows that the rural areas in Northern Nigeria are producing at a much faster rate.

Age and Sex Composition

The figures of the 1952 census show that in Makarfi district the percentage of females is much higher than the males. This is in line with the sex ratio figures of Zaria Province and Northern Nigeria. Makarfi district is also representative of the Northern Nigerian population as far as the age grouping is concerned. On the whole there are more dependent people (below 15 years and above 50 years) in the rural areas than the urban areas of Northern Nigeria.

Implications for an Educational Program

A study of the population data has implications in the field of agricultural development. It should be quite clear that any future program for agricultural development must not only include improvements for the existing population, but must also take into account the projected population increase for the period for which the program is being planned. The density of population, settlement patterns, and the roads and communication has an implication by way of the number of personnel required to do a specific educational job in a given area and time period. The number of personnel at the field as well as supervisory levels should increase proportionately for a given area on a given educational

job with the increase in all or any one of the three factors such as density of population, scatter of the rural residences in space, and underdeveloped roads and communications.

The age and sex composition of the rural population has implications for decision making on the farm and, consequently, on the changes of farm practices. It is well known that the older farmers change more slowly. Hypotheses have been put forward several times that among older farmers, the age of the extension worker is an important factor. In other words, where the decision makers on the farm are of relatively older age, an older extension worker can bring about better results. The age and sex proportions of a population are also the indices for the availability of farm labor.

Migrations of Rural Population Related to Makarfi District

Hausa people by all standards are quite mobile. Travel by local people to other parts of the country or to other countries for various reasons and for various periods of time has been a characteristic of the traditional Hausa culture.

Temporary In-migration. --Inquiries have shown that there are several kinds of in-migration of varying extents and for various periods of time into Makarfi district. Perhaps the biggest in- and out-migration in this area is of cattle Fulanis.

The second type of in-migration into the area is confined to a particular season and for a different reason. Preliminary village survey records in this study show that migrants from more densely populated northern provinces of Kano and Katsina as well as from Sokoto come into the area during the dry season. The available data for 1961-

1962 show that these seasonal migrants come to bigger size villages. In the survey, 26 out of 32 villages had migrants in the year 1961. The six villages with no migrants were much smaller in size, difficult to reach, and had no markets.

The migrants usually work with individual farmers as paid laborers. The craftsmen among the migrants work for themselves or work on hire, depending upon the nature of their skill. Among the jobs performed by these migrants are farm labor, which includes the cultivation of fadamas, fencing, clearing the farms, carrying out manure, helping in the brown sugar making, cutting grass for thatches, and cutting fire wood. The migrants also work on a number of crafts such as building, thatching, dying, weaving, mat making and pot making, etc. The migrants also work on the cotton and groundnut markets as laborers.

During the wet season there is a much smaller in-migration mainly from Southern Zaria and some from Plateau Province. The main jobs performed by these wet season southern in-migrants is farm labor.

Apart from farm laborers and craftsmen, other visitors to the area are traders and Arabic teachers. Their number and period of stay is much smaller.

Impact of Temporary In-migration. -- The impact of this in-migration of farm laborers and craftsmen in Makarfi district is mainly economic. Badly-needed farm labor is supplied by them for cultivation and marketing of groundnuts, sugar cane, cotton, potatoes, and onions in the area. This adds to the wealth produced. The craftsmen in-migrants contribute to the standard of living of rural people by providing new houses and other articles of living. Traders influence the area by

the introduction of new articles of consumption and living, usually factory-made goods in addition to native material. Arabic teachers educate the people in Arabic and help to strengthen Islamic values and ways of life.

Permanent In-migration. --In addition to the above mentioned in-migration there has been a continuous stream of in-migrant agricultural population from the northern part of the country. This in-migration is permanent; the in-migrant acquires a piece of land and makes his home in the district for the rest of his life. In a random sample of one hundred farmers it was found that 23 per cent of the respondents had, at one time or another in their life time, migrated into Makarfi district. A further inquiry as to the area of origin and the time of in-migration of these 23 respondents showed the following distribution:

TABLE 5

THE AREAS OF ORIGIN AND TIME OF ARRIVAL OF 23 PERMANENT IN-MIGRANTS

Time of migration	No. of respondents	Place of origin
2-3 year ago	2	(1 Kano 1 Katsina)
12-15 years ago	7	(5 Kano 2 Katsina)
20-25 years ago	5	(3 Kano 2 Katsina)
27-30 years ago	6	(all from Kano)
35-50 years ago	3	(1 Kano 1 Bornu 1 Bauchi)

The largest number of these migrants is from Kano and Katsina. This is probably due to the pressure of population on land--a problem of man-land relations. The number of migrants falls into natural groups, as shown in the table. They correspond to particular periods of

population pressure. It appears that most of the permanent in-migrants came into this area within about thirty years, starting with the world-wide depression of the '30's, through World War II, and then through post-war food shortage period in the northern provinces.

Out-migration.--The out-migration from this area seems more of a very temporary nature and on a much smaller scale. In 12 of 32 villages in the area, people mentioned that some people go out from these villages. All of these indications of out-migration were of dry season only. The purpose of this temporary out-migration usually is to earn money. The villagers do not work as hired laborers in their own village to avoid ridicule by others.

CHAPTER IV

RURAL PUBLIC INSTITUTIONS AND THEIR RELATIONSHIP TO EXTENSION EDUCATION WORK

Organized agricultural extension education work is closely related to rural public institutions almost all over the world. Within the United States, the birthplace of organized and institutionalized extension work, local county governments participate and support extension work with finances, personnel, membership, and leadership. In fact, extension work in the U. S. is a cooperative effort between the federal and state governments and the counties. A study of the spread of agricultural extension work outside the United States shows that in most of the other countries similar activities are based on and supported by the local rural public institutions to varying degrees. The relationship of Community Development work with the local Panchayats and Block Smitis in India is one of the many examples. The literature of Comparative Extension Education indicates that there are a wide range of types of relationships that exist between the extension services and the local rural governments.

In many underdeveloped countries the rural public institutions are based on democratic principles. Therefore, the educational aspects of extension work and the democratic local governments are in agreement as far as the general approach is concerned. In fact, they reinforce each

other. In African countries the nature of local public institutions varies from place to place. In Northern Nigeria the local governments are characterized by their traditional and feudal nature. The basic question is, how will an educational activity like extension fit into traditional local government, and what influence will it have on the rural institutions.

The following pages describe the nature of the local government in the area studied. The relationships of the local government with the regional government is also shown. On the basis of this study some suggestions, in the form of hypotheses, are presented.

Historical Background

A brief description of the historical events which led to the formation of the present system of local government in Northern Nigeria is necessary for a proper understanding of the present system. As far as historical records are available, Makarfi district has been a part of the kingdom of Zazzau. The other names of this kingdom are Zakzak, Zegzeg, or Zaria.

Originally the kingdom of Zazzau had been the southern-most of the independent, but closely related, seven Habe kingdoms in Northern Nigeria. The oldest of the Habe kingdoms was Daura. Written records of early history of these Habe states are not available. A chronicle of the early rulers of Zazzau is preserved in the form of a manuscript in Zaria.[1] This chronicle gives a list of sixty Habe rulers of Zazzau, ending with Makau.

Towards the 15th century Habe states began to make contacts

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[1]Notes on Zaria Province, an unpublished manuscript from provincial office, Zaria, November 1961, 2 pp.

with the Mediterranean and Arab world through trade and exchange carried out by camel caravans across the Sahara. Arab traders and scholars travelled to this part of the world. Habe states also made commercial and political contacts with more Islamized people of western Sudan. All these influences resulted in the introduction of Islam in this area. "According to available records Muslim religion was first introduced in Zaria around 1456 A. D. through Kano and Katsina, the northern Habe states."[2] In the early 19th century proselytization to Islam was forced and accelerated by Fulanis, who differed sharply from sedentary Hausas in their physical and cultural features. The last Habe king of Zazzau was driven out of Zaria by Fulani crusaders in 1804. Mallam Musa, a Fulani leader, was installed as ruler in his place. The present Emir[3] of Zaria is the 17th ruler in succession since.

The Fulanis ruled Zaria for about 100 years by right of conquest. The beginning of the 20th century saw the incorporation of Zaria into the Protectorate of Northern Nigeria by Lugard. Since then Zaria was ruled by the British through an indirect system of rule. Under this system, the Fulani Emirs of Zaria were directly responsible to the government of Nigeria through local representatives of the British administration. With the promulgation of Macpherson Constitution and with the acquisition of self-government and independence in 1960, the Emir of Zaria became responsible to the North Regional Government.

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[2]E. J. Arnett, 1909, A Hausa Chronicle, J. Roy. Afr. Soc. Vol. 9, pp. 161-167, quoted in M. G. Smith, Government in Zazzau (London. International African Institute, 1960), p. 3.

[3]A native kingdom in Northern Nigeria is called an Emirate and its ruler is called an Emir.

The Present Political and Administrative Setup in Zaria

It has already been mentioned that the area under study is included in the Emirate of Zaria. Therefore, an analysis of Zaria's administrative and political system is necessary in order to explain the system of government in this area. At the Emirate level the present Native Administration of Zaria is headed by the Emir, who is assisted by a number of Councillors. The Emir and the Councillors inherit their positions because they belong to ruling families. Each Councillor usually has a port-folio for one or more departments under the Native Administration. The Councillor is a political position selected by the Emir himself. The function of the Council is to advise the Emir on matters concerning administration of the Emirate.

Under each Councillor, every department is headed by a departmental head, who is assisted by a few assistants at the headquarters and some field officers posted in each district.

Territorially, the Emirate is divided into districts. There are about 15 districts in Zaria Emirate. Each district is administered by a District Head, who is a representative of the Emir. Some District Heads also have political titles and are council members. The area studied in this survey was an administrative district of Zaria Emirate.

In Northern Nigeria, the extension work in the field of agriculture is being done by the Native Administration. Zaria Native Administration is supposed to carry out extension work among its farmers, with technical advice from the Northern Ministry of Agriculture. The Councillor for Natural Resources is the political head of agriculture department. Under him is the head of the agricultural department, called Wakilin Gona in Hausa language. Under the Wakilin Gona are

agricultural assistants posted in each district to work among the farmers. These assistants are under the administrative control of their respective District Heads.

The Relationship of Zaria Native Administration with the Regional Government

Administratively, the centralized government divides Northern Nigeria into 13 administrative areas, called provinces. Each province usually includes a number of Native Administrations. The Province of Zaria includes three Native Administrations, viz., Zaria, Birnin Gwari and the Jema's Native Administration, which, in turn, is a federation of several smaller states.

The provincial administration is headed by the Provincial Commissioner and the Provincial Secretary, who is assisted by a number of administrative officers. The main function of the provincial administration is to control, supervise, and guide the Native Administrations. The provincial administration also has representatives from the Regional ministries who work with the Native Administrations on matters relating to their specialties. Principal Agricultural Officer Zaria is the provincial representative of the Regional Ministry of Agriculture.

Each province is further divided into divisions. Each division includes a certain number of districts in a particular Emirate, or one Emirate or more than one Emirate, depending upon the size. The divisional administration is headed by a District Officer. Ministry of Agriculture usually has an agricultural officer in each division. Due to lack of personnel, some divisions do not have agricultural officers. Zaria Province is supposed to have four agricultural officers. Each agricultural officer advises the Native Administration areas in his division.

The Nature of Advice and Assistance in Agriculture

In Northern Nigeria, all agricultural research at present is being done by the Institute of Agriculture. This institute is a part of the University of the North. There is a central experimental station at Samaru and small agricultural experimental stations and government farms at the provincial and divisional levels all over the country. The provincial and divisional farms and experimental stations are at present run by the staff of the Ministry of Agriculture. The experimental work on these farms is done under the guidance of the Institute of Agriculture. The institute sends back its recommendations on different aspects of farming to the Ministry of Agriculture, which further channels them to its provincial and divisional offices.

In addition to this, agricultural supplies such as fertilizers, seeds, and plants are procured and multiplied by the Ministry of Agriculture. The Ministry distributes them through the respective Native Administrations. Some Native Administrations produce or procure their own requisites under the advice of agricultural officers. The Native Administration agricultural departments have no resources and personnel for doing research.

Agricultural training schools are run largely by the Ministry of Agriculture. The Native Administrations have to depend upon the government for training of their personnel. Because of the lack of funds available with the Native Administrations, the Ministry of Agriculture subsidizes towards the pay of Native Administration trained staff.

Some Problems

Among the major problems that the Native Administrations face in carrying out agricultural extension work is the lack of trained personnel.

Very few of the people working in Native Administrations have training in agriculture. The Councillors of agriculture, through whom the Regional Ministry of Agriculture funnels its advice, have usually no training in agriculture. They have very little understanding of agricultural problems, hence, little appreciation for advice on technical and scientific methods. This lack of training and understanding at the key levels in the Native Administration affects adversely the advice from the government to the Native Administrations. The Native Administrations spend very small percentages of their budgets on agricultural development and personnel for extension work. The nature of the administration in the Native Administrations is diffuse. Personnel are usually hired because of their connections with the Native Administration rather than for technical skill or competency. Therefore, the general working of these institutions is inefficient. The employees of Native Administrations tend to perceive their work through the structure of their organization and thus behave accordingly. Technical efficiency, promptness, and hard work are not looked upon by them in the same manner as by the Ministry of Agriculture. Therefore, most of the Native Administration employees give the objectives and programs of the Ministry of Agriculture only luke-warm and half-hearted support.

There are problems inherited from the past. To the present time, most of the Agricultural Officers were expatriates left over from the colonial administration. With the coming of independence, their past-oriented approach, in which the emphasis was control, direction, and supervision, is resented by the local rulers and Native Administration employees. This problem is being solved by pursuing the policy of Nigerianization, in which Nigerian officers are replacing expatriate

officers. The new Nigerian officers in such positions face the problems of status in dealing with the Native Administrations. Because they come from the same country, they have to show respect to the local rulers and observe the native rules of conduct. This is more true in their dealings with the bigger Native Administration than it is in dealing with the smaller ones. The Regional Government is taking effective steps in their behalf to overcome the problems of status. For example, a recent circular of the Regional Government urges the Nigerian officers to observe such rules of conduct which will enhance their status among the Native Administrations. The specific mention was made of shaking hands and keeping shoes on while meeting the native rulers instead of greeting in the traditional style, in which they would take off their shoes and bow down.

Organization at the District Level

From the above discussion it should be clear that the representatives of the Regional Government usually limit their activities up to the divisional level. At very few occasions the subordinate staff of the Regional Ministry of Agriculture works with the farmers directly. The person in direct contact with the farmers is the Native Administration Agricultural Assistant posted in each district. The organization at the district level is headed by a District Head, who is a representative of the Emir. The District Head is assisted by a District Council. The Council is composed of officials of Native Administration and selected villagers. The formation of these District Councils is a step towards democratization of the Native Administrations. The function of the council is to advise the District Head on the matters of planning development programs in the district. The council is supposed to meet four times a year.

At the district headquarters, the District Head is assisted by office staff and a corps of so-called specialists in the field of health, veterinary and animal husbandry, agriculture, forestry, public works, and adult education, etc. These specialists are technically linked to the Native Administration headquarters departments at Zaria. They are also helped indirectly by technical officers of the regional Ministries stationed at the divisional level.

Administratively, the district is divided into 32 village areas, each under the charge of a Village Head. Village area is the basic unit of administration in Zaria. Village Head is appointed by the District Head after consultations with higher officials and local people. District Head's own consideration and candidate's qualifications are also taken into account. Village Head is selected from the ruling families, called "Dangin Sarauta," and often there is more than one such family competing for this position in each community.

The Village Head is the executive head of the community. His official function is to help the Native Administration at the community level. With the help of his courtiers and other officer bearers, he makes sure that his duties are properly performed. Apart from his official functions, he also exercises an informal power and influence on the local people by arbitrating in disputes, etc., and thus reinforces community integration.

Rural Service Agencies in Makarfi District

A number of Native Administration and government specialized agencies operate in Makarfi District in order to serve rural people in their specific interests. Rural life is very much interrelated and rural

problems are so complex that a person working on a particular aspect of it may not be fully successful unless he coordinates his activities with other workers. For example, an agricultural extension worker cannot teach an improved practice when the farmer is sick and needs medical help. Agricultural innovations often require capital which may have to be arranged through the Department of Cooperatives. The work of the representatives of Veterinary and Forest Departments is very closely linked with agricultural extension work. Educational agencies such as adult education, rural schools, and the agencies engaged in mass media such as the Division of Public Enlightenment of the Ministry of Information can be extremely helpful in carrying out agricultural extension education work. Therefore, it is necessary that an extension worker should know the representatives of different agencies working in his area and work in close cooperation with them. He should supplement his own efforts with the work being done by these agencies in order to promote new agricultural practices and techniques.

A survey of the rural service agencies in Makarfi district indicated that the representatives of many agencies operate here. They include Agriculture, Animal Husbandry, Forestry, Health, Education and Adult Education, Public Enlightenment, Cooperatives Departments of the Regional ministries. Nigerian Tobacco Company, a private company, is doing all the tobacco development work in the area through an integrated system of supplies, tobacco extension education, and marketing of tobacco.

Trade Centers and Market Areas

Some villages serve as centers for local markets, where people from nearby villages visit for trading and exchange. Articles produced

in the villages are sold and articles produced outside are bought.

Rural markets are held in some villages on appointed days. Generally speaking, these markets do not have clear cut trade areas; neither do they follow district, community, or neighborhood boundaries. The number of rural people attracted by the different markets seems to depend on the size and scope of the market in terms of quantity and quality of goods available for sale. Another important consideration is the distance of the market from the village. The data from Makarfi district indicate that nearby markets are visited more often than distant markets. The bigger markets are also among the more often visited.

Among the different trade center villages in this area there are degrees of concentration of other activities and facilities available. Some of them are more important centers than others. Hence, the intensity of use of these centers varies according to importance.

A complete description of the rural markets is out of place here. Suffice it to report that a wide range of agricultural produce is traded. Crops grown in the area and livestock and livestock products are sold. A variety of prepared foods and local liquor (giya) are among other items for sale. Agricultural implements, pottery and leather goods, clothing, cosmetics, medicines, household articles and kitchen equipment, things for decorations and mats are some of the other items.

These markets play an important role in the economic and social life of the rural people. Apart from being a place for the exchange of economic goods and services, local markets are also a place for social get-together and recreation. Many village folk attend the markets not only for buying and selling, but for social purposes. Markets also have an educational value and are a good medium of introduction of new things

especially items of living in rural life. The traders bring new articles for sale and profit, and this is the way new articles are introduced in the villages.

In addition to the general markets, there are specialized markets for cotton and groundnuts sale. These markets are visited by the farmers during the season in order to sell their produce. Some villages are specified for the sale of tobacco.

Implications for Improvement of Extension Education Work

The preceding pages have described the organization of the Native Administration in Northern Nigeria. The relationship of Native Administration with the Regional Ministry of Agriculture in carrying out agricultural extension education work has been shown. By all standards the quality of educational work done by the Native Administration is very poor. This has been very well realized in official as well as non-official circles in the country. Realizing this drawback, the Government of Northern Nigeria is very anxious to improve existing work.

Usually two arguments are given by the people interested in this subject. One school of thought argues that the Ministry of Agriculture should take over the job of extension education from the Native Administration and do this work with its own staff by extending below the divisional level. The argument usually suggests that in each district the government should appoint its own extension workers trained in extension methods and agriculture. It argues that these workers should work under the supervision of the Divisional Agricultural Officers. The basic generalization underlying this thinking is that wherever the information has to flow across structural boundaries, the flow of communications is not effective, smooth, and regular. A further extension of this

idea will be that agricultural research and extension work should be within the same structural boundaries. This implies that in the future either the extension work should be taken over by the university or research work should be transferred to the Ministry of Agriculture. Such a decision is necessary in the future in order to consolidate research, extension, and training within the same structural boundaries.

On paper this idea looks satisfactory, though its applicability, at this point in time, remains to be tested in the field. The writer has observed that the Native Administration is very effective in working with the rural people. It will be quite difficult for outside agencies to work in the areas of Native Administration unless they have their goodwill and cooperation. Taking away work of agricultural development from the Native Administrations might antagonize them and create ill-will among the two levels of government. Also, this is not possible at this stage of development in the country; it is not possible when considering the level of training, availability of personnel and funds in the regional government. Such an approach also involves a political question. If the Ministry of Agriculture takes over agricultural extension education work from the Native Administration, the other Regional ministries will also want to take over the activities in their own fields. Such a thing will cripple the Native Administration in the country. The regional government may not be willing to take such a step, as is usually seen from the press statements of the North Regional political leaders, most of whom come from ruling families in different Native Administrations.

Sometime back, a one-man commission was appointed by the Government of Northern Nigeria to advise the government on matters of improvement in the working of Native Administrations. The commission

recommended that the Regional Government take over the responsibilities from the Native Administrations. The recommendations of the commission were never implemented by the government.[5] However, the question is still unanswered and an effective solution is desirable.

The second argument in this behalf is moderate. It is usually advanced by those people who have profound belief in the power and importance of local institutions. The main point in this argument is that the Native Administrations should be maintained. The Regional Ministry of Agriculture should work with them in order to improve their finances, level of training of personnel, and the working and efficiency of the Native Administration employees by proper supervision, control, help, and guidance. The basic idea in this argument also implies that, through time, democratic elements and processes can be introduced into the working of the Native Administration. If the work of extension education is left with them, it will reinforce the democratic process.

Suppose the first argument is accepted as a standard procedure of government in that country; then sometime in the future the regional government would likely have to decentralize its powers and re-establish the local institutions again. If this were the case, it may be worthwhile to keep the Native Administration now and to improve upon it instead of doing away with it. The writer supports this idea and suggests the following procedure to improve the efficiency of the Native Administration as related to agricultural extension work. The suggestions are based on discussions with civil servants of the Regional Ministries and the officials of different Native Administrations.

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[5]See Husdon Commission Report, Native Authorities, issued by the Government of Northern Nigeria, Kaduna, 1959.

1. The regional government should subsidize the salaries of all the staff of agriculture departments in the Native Administration. Such grants may be made through the local agricultural officers. The grants should be based on technical competency of the employees and efficiency of the Native Administration.
2. The personnel systems of the Native Administration may be brought in par with the regional government and chances for mobility of the trained Native Administration staff to supervisory jobs in the regional government may be provided. The fact of technical efficiency may be stressed in the matters of promotion and the grant of other privileges to the employees.
3. Agricultural development and program planning committees may be organized at the provincial and Native Administration basis. Agricultural officers of the Regional Ministry of Agriculture should work as secretaries of such committees. The Emirs and other traditional leaders may be encouraged to participate and learn about scientific methods so that they can appreciate the importance of extension work.
4. The Ministry of Agriculture should help the Native Administration in the training of their staff. New trained Agricultural Assistants should be appointed in place of old untrained and illiterate extension workers.
5. In order to increase the control of agricultural officers in the working of extension service, the selection of personnel for the Native Administration should be made under the supervision and approval of the agricultural officers. If a particular person is not recommended by the agricultural officer, he should not be hired by the Native Administration.

Implications of District Level Organization for Educational Activities

The implications of the district level organization are that, under the present circumstances, the extension workers must seek the cooperation and legitimization of the District Head and, in turn, the District Council in introducing change. The District Council affords an excellent opportunity for involving the representatives of the rural communities in program planning for the district. Taking into account the educational levels of these rural representatives, it is clear that most of the work of program planning will have to be done by the extension worker himself. It may be worthwhile, however, to involve these representatives. The interests of the rural people in the area can be ascertained through them. These councillors can be helpful to the extension worker in introducing him to the local farmers in the communities. From the District Council some interested members should be selected to form a committee for agricultural development and for the purpose of stimulating interest about agricultural improvements in the area.

The local extension worker should coordinate his efforts with other district level officials of the rural service agencies. Of particular interest should be the representatives of Animal Health and Forestry Department and the representatives of the Public Enlightenment and Adult Education. Such contacts can help the extension worker in multiplying his efforts.

Implications of Trade Centers for Educational Activities

The importance of local rural markets as a medium for contact with the farmers for extension work cannot be overemphasized in Northern Nigeria. Markets offer excellent opportunities for the use of

mass media in order to spread information to the people. Distribution of written pamphlets, simple instruction sheets, display of posters, holding of lectures, illustrated talks, etc. are some of the things which can be done by the extension workers in the local markets. Many rural markets in this area have cultivated fields in the vicinity which offer an excellent scope for laying out a well-labelled result demonstration or for demonstrating a better method or a technique. Extension workers can visit the market place, exhibit, demonstrate, and explain the usefulness of a particular idea to the people. Local village heads can be asked to put up a special thatched stall for the use of the extension worker in the market. This way extension workers can be found and contacted by the farmers. Since the number of extension workers is small, this will be a good method for multiplying their efforts and maximizing their contacts.

It is true that not all of the people in the market will be interested in listening to or consulting with the extension worker. Observation, however, confirms the fact that in each market there are always people who can be attracted and made interested. Once the visits of extension workers are regularized and people are informed about them, there can be extensive opportunity for giving information and establishing personal contacts with farmers for further work.

Another important way in which rural markets can serve the extension worker is through channelling supplies such as improved seeds, fertilizers, insecticides, implements, and other recommenations. The forthcoming pages will indicate that a sizeable number of rural people are already buying their indigenous farm supplies from local markets. There is no reason why the extension service cannot utilize

these channels for new and improved supplies through controlled, approved traders. Availability of new supplies and the presence of local produce in the market can reinforce the work of the extension worker in demonstrating and showing the difference between the old and the new.

Specialized markets offer teaching situations for such specific subjects as the cultivation and preparation of groundnuts and cotton for sale.

CHAPTER V

COMMUNITY, NEIGHBORHOOD, AND FAMILY

Extension service personnel who seek to serve a rural clientele must understand the rural social structure in order to reach and serve the people effectively and to obtain their participation. To gain this understanding, a study of the other salient features of the social structure of Makarfi area was considered necessary as a part of this study.

Spatial Grouping

The Community

In Makarfi district the boundaries of a sociological community usually coincide with the boundaries of the village area--the basic administrative unit. Smith[1] traces the present situation back to the policies of British administration which "constantly tried to make the boundaries of village-areas . . . follow those of the local communities." If this is so, it is an excellent example of the application of sociology in public administration.

The present typical community in Northern Zaria consists of a central larger village surrounded by smaller settlement units (hamlets)

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[1] M. G. Smith, The Economy of Hausa Communities of Zaria (London: Her Majesty's Office, 1955), p. 6.

and isolated and scattered households at varying distances. The local community is composed of (1) a series of neighborhoods in the bigger central village, (2) a series of satellite neighborhood units scattered round the bigger village in the form of sub-communities, and (3) a series of scattered households. These households may be either single or in clusters with more than one household linked by kinship. They are usually represented in the community through the head of the kinship unit. Cattle Fulanis in the form of single households may not have feelings of belongingness to any local community, but they pay their tax to the village head in whose area they temporarily settle down. They usually visit that particular village more often than other villages for the sale of milk and milk products and to attend the market. The settled members of the communities do not consider them as community members. Maguzawa (Pagans) form distinct sub-communities of their own. They are linked to the central community through a representative. The community is usually named after the central bigger village.

Delineating a Local Community

The inhabitants of one community in Makarfi district distinguish themselves sharply from other communities. This is usually indicated by the feeling of belongingness to a particular village. Frequency and character of social relations and interaction among the inhabitants determine the community boundaries. Ties of kinship and marriage bring the inhabitants of communities closer together, but their relationships are more regular, stable, frequent, and continuous within than outside the community boundaries.

There are, however, some characteristic features which are commonly found in most of the communities and distinguish one community from another. The presence of a village chief is a common characteristic of all communities in Makarfi district. All adult males who belong to a particular community pay tax to the same local village head. Another important feature of a local community is the presence of a Liman (religious head). The religious members of a community recognize one common Liman as the highest religious authority in the community and participate in prayers under his leadership. The presence of a market and its use by community members is another feature. Members of a community usually use one common market more than others. These three features are usually present at the community headquarters.

As a general guide these facts tell how to distinguish a community in this area. However, they may not be taken as absolute criteria. The presence of a Liman and prayer ground is not important for pagan members of the community. Some communities do not have their own market but they use the markets in surrounding villages. Two facts in delineating a community, however, stand out and can be applied without hesitation: (1) members' own feelings of belongingness to a particular community, (2) paying of tax--each adult member of a community pays tax to the chief of his own community. Those who do not share these common features may not belong to the same community.

The rural community in Northern Zaria is not an independent unit. Politically and economically it is a part of the district and, in turn, emirate of Zaria. Socially, economically, and spiritually each community is a part of a wider grouping of communities linked through

marriage, sharing or use of markets, and a number of other ties based on different kinds of interests in everyday life. Therefore, there is considerable inter-community social interaction.

The Neighborhood (Unguwa)

It has been mentioned that each local community in Makarfi district is composed of a series of neighborhood units located in the main town as well as in the form of satellite hamlets around bigger towns. The operational definition of the term "neighborhood" in this area is "Ward" or "Unguwa" which is a sub-administrative unit of a village area. It is a territorial unit. All neighborhoods in a particular community usually share the same service facilities. Each neighborhood is under the charge of a ward-head called "Mai-Unguwa." He is the medium of communication between the village head and the people of that neighborhood, and vice versa.

Sociologically, a neighborhood unit is usually an extended kinship group. This is more true of "Maguzawa" and Fulani neighborhoods than of Hausa neighborhoods. Hausa neighborhoods are usually more heterogeneous in kinship character. There is a distinction between neighborhoods in the main village and those outside of the village. Neighborhoods outside of the main village usually have more clear cut extended kinship groups of homogenous origin. A neighborhood in the main village may contain persons of varying origins residing in the same territorial limits.

Neighborhoods are usually composed of a group of households or compounds adjoining each other. Historically, the neighborhoods arose from compounds. When population in an individual compound increases to such an extent that it necessitates the building of another compound, the family moves out into a new compound and this process

repeats itself cyclically. The immigrants join this group of related households and lend their heterogenous character. During this process of multiplication a family may move out to another place and settle there, which will, in due course of time, become another neighborhood.

Political Organization at the Community Level

Each community is divided into wards (Unguwoyi), each under the charge of a ward head who represents his ward in community affairs. The ward heads (Masu Unguwa) are appointed by the village head to help him carry out his political and administrative functions. In addition, each village head has a number of assistants (courtiers) who have titles similar to those of the central political system in Zaria. The titles usually found are Waziri, Madaki, Galadima, Fagaci, Magaji, Turaki, Makama, Ciroma, and Sarkin fada. The presence of different titles and titleholders varies from community to community in Makarfi district. In some communities, all of the above mentioned titleholders are found, while in others some of the titles may be absent. The relative rank of different titles also changes, depending upon the presence of titles and the persons holding the rank. However, the presence of a group of courtiers of the village head in each community is a common feature. Village head's assistants come from ruling families (usually Fulanis) entitled to the political privileges in each community. There is a distinct pattern of behavior and etiquette of rank within the titled individuals and between the titled individuals (Sarkawa) and the common folk (Talkawa) of the village.

Another important person, a member of this high level group, at the community level is the village Liman who is respected by every person because of his religious achievement and authority. He is usually quite closely connected with the village head. There may be

more than one Liman in a given community in a hierarchical fashion.

The Nature of Community Leadership

It is hard to determine whether the people described above (Sarkawa) are the real leaders of the community in a sociological sense. This is so because the positions they hold are usually ascribed, and very few, if any, of the titles are obtained through personal achievement, hard work, and skill. Therefore, it is appropriate to call them "the village elite" or a group of decision makers centered around the village head. Since the village head also communicates through this group with the village people, they also serve as a channel of communication. Another channel of communication between the village head and the local people are village head's personal messengers.

A study of the leadership qualities and potential of this political elite in rural communities is a subject worthy of an independent inquiry, which should contribute a great deal to an understanding of the leadership phenomena in rural areas of Northern Nigeria. The present sample was stratified accordingly and includes ten respondents who hold political titles in their respective communities. The ensuing analysis will differentiate this group from other farmers in different aspects. For the time being suffice it to say that the village head, his assistants, and village Liman are the most powerful political group at the community level. They are the decision makers and legitimizers in the local communities. The village head is at the top of this group and his authority comes from the upper levels of administration.

Professional Organization at the Community Level

Each community in Northern Zaria contains several professional

groups of people. Mention of the different crafts practiced in the area has been made in the ensuing chapters. Each craft groups usually has a headman who represents that group in village affairs. The head man may or may not have any assistants. Traditionally, there was a group of titleholders for each craft. These craft titles were similar to the titles of the central political system in Zaria. With the abolition of craft tax, most of these titles have died out. However, in each village, chiefs of different craft groups are still found who are appointed by the local village head, uusually on the basis of wealth, prestige, popularity, and the scale of their activities. In each village there is also a chief of the farmers (Sarkin Noma) who is the best farmer in the community.

Age Group Organization

Age group organization of the local communities allows for the selection of a chief of the young men (Sarkin Yara) and a chief of young women (Gwamnar Yammata) in the villages. Chief of the young women is not present if there are not enough girls in the required age group. The selection of the chief of young men and young women is made by the village head in consultation with the local people. Sarkin yara and Gwamnar yammata are the traditional organizers of boys and girls at the community level.

Social Stratification and Principles of Association in Local Communities

In Makarfi district race, religion, education, age, sex, wealth, and occupational class are some of the features which form the basis of social stratification and association between individuals.

Ethnically, the people living in the area can be classified into

two broad categories, Hausa and Fulani. Muslim Hausa differ from Pagan Hausa in religious beliefs. The interaction between the two groups is very small. Pagan Hausas are relatively in a subordinate position, because most of the political positions in the local communities are held by people of Muslim origin. In this respect there are general feelings of superiority and inferiority between the two groups.

Cattle Fulani are considered by settled people as strangers because of the temporary nature of their settlement. Hence they do not count very much in day-to-day affairs of communities.

The main body of residents in the local communities is made up of Muslim Hausawa and settled Fulanis. They share a common language, culture, and history in recent times. Intermarriage between these two groups is prevalent and the individuals of both groups share a common set of social and economic relationships.

However, there are general superiority-inferiority relations between Fulanis and Hausas on the basis of race, culture, and historical background in the distant past. Most of the Fulanis have come to this area as conquerors during the Jihad (Religious War) of 1804 and were installed in political positions in the local communities. Most of the village chiefs in Makarfi district are Fulani, with a few exceptions of Habe. The politically superior position of Fulanis in the villages is not a source of hostility to the people of Habe origin. The present relationships between the two groups is of ordered symbiotic nature, which are beneficial and necessary to each other in spite of the cleavage mentioned above.

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Differentiation based on sex can most probably be traced to religion. In Muslim societies, it is desirable to seclude women.

Because Makarfi district is predominantly Muslim, there are different degrees of seclusion of wives. Male members in the family are senior to their counterpart females. At the community level women do not play any conspicuous role in the political or social life. In this respect sex limits most of the community roles to the males and thus does not form a basis for further stratification.

The stratification based on age is very important. In extremely status-conscious Hausa society, old age is very highly respected. This is true for both sexes, other things being equal. The most pronounced difference in age is between the generations. An older person of a senior generation is always considered senior. The oldest male member of the family is followed and respected by others as "Maigida." The younger male members of the same generation in a family hold intermediate positions and the still younger ones are considered mere youths (Yara). The holding of a political position and sometimes the family of origin may, however, override this consideration. A younger man holding a political position may be respected by the older non-position-holders, who will still be considered by the younger members as gentlemen (Dattijai).

Education, and especially religious education, is a much desired trait among the people of Makarfi. The possession of knowledge (Ilmi) is very desirable and sought after. Arabic teachers are another group who count higher because of their educational achievement and their contribution in teaching Arabic.

Stratification of local communities in terms of wealth and economic status can best be explained on the basis of occupational class. Different occupational classes are graded in terms of prestige. In each

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occupational class, there is further economic stratification based on the wealth and fortune owned by the individuals.

It may be remembered here that no single one of the above criteria determines the prestige (girma) of an individual. It is probably the sum total of all the criteria and something more that will determine the prestige of an individual in the village society. Hausa people describe a state of social and economic well-being of an individual through a very complex concept called "Arziki." Smith[2] explains this concept as "Involving such elements as birth, prestige, political protection, large family, good farming, money, and wealth or greater than average consumption." As it is seen, the concept has both economic and social aspects. Social aspects, such as birth, cannot be achieved by the individual; therefore, the individuals with low birth would concentrate on economic aspects through intense economic activity to become wealthy men (Masu-arziki) within the reach of their class.

Regarding the position of different occupational groups in the status structure of local communities, the following structure given by Smith[3] still conforms to the local pattern from high to low in prestige.

Sarakuna na asali - the aristocracy by birth
Masu-sarauta - aristocracy by appointment to office
Mallams and Koranic students
Attajirai - successful merchants
Masu-sana'a - craftsmen other than those mentioned below
Yan kasuwa - smaller traders
Dillalai - brokers
Manoma - farmers with unimportant subsidiary occupations
Makera - blacksmiths
Maharba - hunters
Maroka and Makada - musicians, drummers and eulogists
Mahauta - butchers

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[2]Ibid., p. 15.

[3]Ibid., p. 16.

Formal and Informal Organizations

Very little of the rural life in Makarfi district is organized on a formal basis. The extent of formal organizations in the area is limited to four co-operative credit societies in the villages of Hunkuyi, Kudan, Gimi Dabosa, and Taba with a total membership of 324.[4] In addition to this, each village in the area is supposed to have a formally organized village council. Personal observations have shown that the basis of organization of these village councils is rather traditional and informal. Members of the village council are nominated from among traditional power elite. Most of the village councils are not functional.

Informal Groups

Largely, the rural society of Makarfi is organized on an informal basis. Interested groups of different kinds and cliques based on religious, social, political, and economic considerations exist. These informal groups serve as important channels of communication.

Political Cliques

Mention has already been made of the village head, his assistants, ward heads, etc. who are an important political group at the village level. In some villages there is usually another clique which is the political rival of the ruling group. The leader of this group may be a rival claimant to the important position of village head. The existence of such groups varies from community to community.

Informal Groups Based on Economic and Other Interests

The most prominent informal grouping among rural people of this area, based on economic interests, is "Gayya" and "Adashi."

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[4]Personal Communication with N. A. Agricultural Assistant (Co-operatives).

Gayya is a working association whereby a farmer, during a peak labor demand period on his farm calls upon his relatives and friends to help him on an appointed day. The host is expected to provide food and possibly a feast to the workers in the evening. The invitees work on his farm from morning till about mid-day. A farmer who calls for a gayya is also supposed to respond to similar reciprocal calls. The nature of this grouping is very temporary and is limited to certain parts of the wet season. In Makarfi area "gayya" is mostly called for weeding and sometimes for harvesting. In this study it was found that 34 farm families out of one hundred had called for "gayya" last year. The inquiries indicated that the extent of "gayya" is decreasing under the pressure of individualism and political rivalries in the villages.

Adashi is an informal system found mostly among women in Makarfi district. Men also practice it, but to a much lesser extent. Adashi is a saving society. Individuals intending to form an adashi get together, each one contributes a decided sum of money and the whole pool is given to one of the members in need. The time intervals for collection of funds are usually decided by the members themselves. Money is either collected weekly or monthly and each time is given to a different member. Under this system no interest is charged.

Koranic Reading Groups in each village are based on religious interest. Interested people get together under the leadership of a teacher and read Holy Koran. These groups are of fairly stable nature and a large number of adult males take part in them.

Informal Gatherings. In most of the communities in Makarfi there are places where people get together in the afternoon or in the evening to

exchange gossip. Such a place may be near the village head's house, near the Mosque, or near the market place. These are also the places where a radio may be played or a newspaper read.

Implications for an Action Program

A description of the salient features of the rural social structure relevant to an educational program has been given in the preceding pages. Local community provides the setting for the extension worker to establish contact with the farmers. It appears that, unlike western countries, the rural community is highly important in Nigeria in the conduct of extension work. Before an extension worker reaches the farmers, his first contact will be at the community level. Before he can be accepted by a farm family, he must be accepted by the local power structures, or at least his action must be legitimized.

In a situation such as this, where the local community is the first stage of contact, it is important that agents of change be aware of the territorial limits of the community and understand its structure. Community is very important from the point of view of program planning. At the present time the programs of agricultural development must be planned at the community level. This is desirable due to the lack of personnel in the extension service and the educational level of the farmers.

From knowledge of the local community structure it appears that extension workers cannot bypass the local hierarchy at the community level in order to establish contact with the farmers. They must first contact the power elite in the villages. The extension worker must obtain their approval and enlist their help in gaining rapport in the local communities. This is important in the early stages of contact. Once

the contact is established the extension worker can work directly with the farmers, if he so chooses.

The position of the village head and the other power elite in the village has an important implication. The common people of the village feel very loyal to this group of people and usually follow them. Suppose a new practice, idea, or technique in agriculture is approved and legitimized by the village elite; the common people of the village will take it up soon. Sometimes they will do this in order to please the village head, without being convinced about the usefulness of the idea. In order to demonstrate their loyalty they will start doing that particular thing and thus, in the process, will receive self-demonstration and self-education. On the other hand, if the extension agent has to demonstrate the same idea on the basis of individual farmers or groups, it will take a long time to achieve that high a rate of demonstration and education. Therefore, it can be assumed that the local extension workers can gain a much faster rate of adoption if they convince the village elite about the usefulness of a new idea or practice and get this thing recommended to other farmers through this power group than by trying to demonstrate on an individual or group basis without much involvement of the local power elite. This argument also implies that the extension worker should use other alternatives available to him and not rely only on the local power elite. As the process of adoption of new ideas and practices advances in time, new leaders for agricultural innovations will appear and receive recognition by the local people. Extension workers should also work with such leaders.

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They will look towards the village head for the initiative. This will also necessitate help and the willingness of the village head and his assistants. It must, however, be remembered that all of the village heads will not be equally appreciative and interested in new ideas. Therefore, it is important that local extension workers start in those villages where the local power elite is receptive to and actively interested in extension work.

Village traders and craftsmen usually have enough cash to invest in an attempt to make more money. They are also farmers and, hence, more suitable for introducing new ideas involving monetary expenditure. They can take risks more than other farmers who do not have ready cash during the time of year when investment is required. Village traders are willing to stock improved farm supplies which support the educational work of extension agents, provided they are given enough profit. Education and training of these people in the handling of supplies is needed. As the program of extension education in a particular activity expands, the amount of supplies needed also expands. If the extension workers continue to handle such supplies, much of their time will be spent in administrative work. This hampers the educational effort. If the traders are trained to handle supplies, the extension agent will have more time to do educational work. Trained traders can also reinforce the extension worker in his educational efforts.

Village carpenters and blacksmiths can be trained for making and repairing simple farm tools of an improved nature evolved by the experimental station.

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agriculture. Clubs of farm boys on the model of 4-H clubs of the U. S. A. can be started. It is suggested that the suitability of Chief of the Young Men (Sarkin Yara) as a leader for the local youth clubs may be explored in comparison to the other potential youth leaders and school teachers.

The local extension worker should be aware of the existence of formal and informal organizations and, if possible, try to use them in his own work. For example, in the absence of proper credit facilities and due to the prevalence of high rates of interest in rural areas, it may be possible to encourage people to organize themselves into more adashi groups. At present the money collected is spent for consumptive and social purposes. Some educational work in order to extend the idea of using collections for productive purposes among the adashi groups will prove useful. The possibilities of such existing organizations to fit them into some formal framework may be looked into. Blanckenburg[5] reports that in a village in Western Nigeria an informal work group had organized itself into a cocoa cooperative society.

Existence of village factions must be recognized by the local extension workers. The success of extension work will depend on cooperation that he can get from both groups. He can achieve better educational results by working with all of the factions in the village rather than working with the ruling group alone.

The places of informal gathering in the rural communities can be used by extension workers to contact farmers and become acquainted with them. Such places afford a good opportunity to spread information in the village. Most outside visitors already use this medium.

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[5]P. Blanckenburg, Rubber Farming in Benin Area (unpublished) (Nigerian Institute of Social and Economic Research, Ibadan, 1962), p. 6.

Rural Family

Family Types

In this study the family has been defined as an association of individuals, related by kinship, who act as a unit of production and consumption. The family usually has common farms; members recognize a single head and eat from the same pot. There are two major family types in this area, "Individual family" and "Composite family" called Gandu.

Individual Family

It is referred to as "Iyali" by the Hausa people. It is composed of a single adult male head, his wife or wives, and his unmarried children. It can again be differentiated according to whether the family head is monogamous or polygamous, in which case he plays the role of husband in more than one nucleur family.

Gandu

Gandu is a composite family composed of several individual families, in which the males are related to each other by kinship. There are several variations in the organization of gandu in this area. In one case, a family head with his wife or wives, unmarried children,[6] and married son or sons with their families may live together. In another case the gandu may be composed of brothers and their families, while in the third case married sons, nephews, and brothers of the family head may live with him. Gandu is a production and consumption unit. All members of the gandu may or may not live in the same

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[6]Including adopted children.

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compound, but they usually do.

Production and consumption systems also vary in different gandus. Mostly, all male members of a gandu work together on the gandu farms and all produce, especially food grains, are stored in the gandu granaries. Cash crops are sold by the gandu head. He pays taxes for every adult male in the gandu and spends on social and ceremonial occasions and purposes, e. g., marriage. In most of the gandus, male members are allotted their individual plots on which they work on specified days. These plots are in addition to gandu farms. The produce from these individual plots is sold and used by the individuals. During the dry season members of a gandu may or may not pursue subsidiary occupations. In the case of members pursuing other occupations, the earnings are used for individual purposes. In some cases gandu members work and eat together only during the wet season. During the dry season they may divide the produce from the farms individually and each individual family may cook and eat on his own.

The head of the gandu is the senior male member, usually father of the other adult males. In many instances after the death of the father, brothers decide to continue in a gandu system under the leadership of the senior brother. In other cases, in the event of death of the gandu head, the gandu splits into individual families which begin to operate as individual production and consumption units.

The senior wife of the gandu head is usually the head of the women's section of the gandu. The wives take turn in cooking gandu food for a whole year or part of the year, depending upon the arrangement. The wives in a gandu also pursue individual income earning activities and money so earned is used by each wife as she desires.

Inquiries in the villages indicated that the gandu system of family organization is slowly breaking down under the pressure of individualism and forces of social and economic change, especially introduction of cash crops. Some sources attributed political awakening of the people as one cause of downfall of the gandu system.

TABLE 6

OCCURRENCE OF FAMILY TYPES ACCORDING TO SOCIO-ECONOMIC STATUS AND TRIBES IN ONE HUNDRED FARM FAMILIES

Family Types	Total in the sample	Settled Muslim Farmers: Mainly traders	Political title holders	Other farmers	Pagan	Cattle Fulani
	Percentage of Families					
Individual family	62	50	40	68	50	70
Monogamous	39	10	30	46	20	50
Polygamous	24	40	10	22	30	20
Gandu family	37	50	60	32	50	30
Father and Son	13	-	20	12	20	20
Father and Sons	4	-	-	2	20	10
With one Brother	12	-	30	15	-	-
With more than one brother	6	50	10	-	-	-
With brothers & sons	3	-	-	3	10	-
Total percentage	100	100	100	100	100	100
Total number	100	10	10	60	10	10

Size and Composition of the Rural Family

At the time of this study there were 804 persons living in one hundred rural families. These were the people "fed by" the family head.

Average sizes of different types of families has been shown in Table 7. The overall average size of the household in the area is eight, varying from seven in Hausa families to eleven in Pagan families, and nine people living in an average cattle Fulani family. Average size of individual families for Pagan and cattle Fulani is seven and for settled Muslim farmers it is a little over five. Gandu size is also the smallest (eleven) in settled Muslim Hausas. Pagan gandu is the largest in size, followed by Fulani gandu. The overall average size for individual families and gandu is 6 and 12 respectively. The smallest family was composed of two members (husband and wife), and the size of the biggest family in the sample was thirty-eight.

TABLE 7

SIZE OF DIFFERENT FAMILY TYPES ACCORDING TO TRIBE
(Figures show the number of persons in each family)

Family Types	Settled Muslim Hausa	Pagan Hausa	Cattle Fulani	Average Size of the family types
Individual family	5	7	7	6
Gandu family	11	15	13	12
Average Size of the Family	7	11	9	8

Population figures for these 100 families show that 47.5 per cent of the inhabitants in one hundred families are males, whereas 52.5 per cent of them are females. Among the children under three years of age, more males were reported than females. The same was true of unmarried children. Among married adults the number of females was much larger than males. This is probably due to early marriage in the

case of women. Elderly adults had an overwhelming majority of old women.

The individual families have comparatively less babies and a greater percentage of unmarried children than in gandus. The total proportion of unmarried children in individual families is higher than in gandus. The percentage of elderly adults is also higher in individual families. The proportion of married adults is higher in gandu-type families than in individual families. This portion of the age group of the rural families makes up the farm labor. The proportion of farm boys, on the other hand, is slightly larger in individual families. Farm boys are an important source of labor among the rural families of Makarfi.

TABLE 8

AGE AND SEX COMPOSITION OF FAMILY TYPES IN ONE HUNDRED RURAL FAMILIES, MAKARFI DISTRICT, 1962

Age group and sex	In total population	In individual families	In gandus
	Percentage of the total		
Babies under 3 years	15	14.1	16.2
Unmarried children	28.9	31.3	26.7
Boys 4 - 12 years	11.0	10.9	11.2
Girls 4 - 15 years	12.0	13.7	10.5
Boys 13 - 20 years	5.9	6.7	5.0
Married adults	48.6	44.6	51.8
Male	20.3	18.5	21.8
Female	28.3	26.1	30.0
Elderly adults	7.5	10	5.3
Male	1.7	3.0	0.7
Female	5.8	7.0	4.6
Total percentage	100	100	100
Total number	804	368	436

Family Living

A compound is a territorial unit for family living in Makarfi district. In the case of a large proportion of the settled farmers, the living quarters are enclosed by a wall. The outer wall may be made of mud, guinea corn stalks, grass thatch or Zana mats or a combination of any of the above material. Use of material depends on the economic position of the household. The mud wall is considered more expensive. Variations in style and construction of housing are mostly based on the origin of the family and present economic status. On the whole, Muslim farmers observe strictness in the matter of strangers entering the compound. In Pagan families there may or may not be any wall around the household. Nine out of ten cattle Fulanis in this area did not have any walls around the houses.

Power Structure in the Family

In general, the rank system in the family is determined by age and sex considerations. The senior (both in age and generation) adult male is the head of the household and the leader in the family. He is the contact point for all outside contacts. He is also the chief decision maker. Male adults follow in rank according to seniority of age. Among the women of the household the senior wife of the head of the household is the head of the women's section of the compound.

In theory, the Maigida (the male head of the household) and the Uwargida (the senior wife of the Maigida) are supposed to make all of the major family decisions. However, there are variations in decision making in different spheres of family activities. In this study data were collected on ownership of property and decision making on agricultural matters which are presented in the text that follows.

Discussion

The rural family is the basic unit to which the extension worker has to gear his educational activities. An understanding of the structure and composition of the rural families is, therefore, pertinent to extension work. Since the trend is towards individual families, this type of family organization will be more important in the future. Individual farmers can put in more effort because they know that the gain from improved farming practices will be enjoyed by them, rather than by the whole family. Hence, there will be more motivation for adoption of new and improved practices. A study of the ages of the heads of the households shows that the average age in the case of family heads in individual families is younger (41 years) than the average age in the case of the head of the gandu-type families in which the average is 46 years. If age is an important factor in the adoption of farm practices, as has been shown by researches on the diffusion process elsewhere,[7] it can be assumed that work with the individual families will bring quicker results. Individual families have a slightly greater percentage of farm boys; hence this type of family is more suitable for rural youth work.

On the other hand, labor resources in the gandu-type families are better. In view of the general shortage of capital in rural areas, the desirability of labor-intensive farm practices suits more favorably to gandu-type families. Since the gandus are bigger than individual families, a decision in order to change a farm practice in Gandus can bring bigger results as compared to individual families. The unit of decision making in both cases is the family head. The extended families have been seen

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[7]This is also true in Northern Nigeria as will be clear from a study of the use of superphosphate in the last chapter of this thesis.

to have progressive characteristics. For example, in Eastern Nigeria the extended families help their members in social mobility by contributing towards their education in foreign countries. The extended families could have better capital resources in order to invest in desirable projects. However, the effects of family type on the introduction of farm practices yet remains to be seen.

The implications of the family living and power structure in the rural family suggest that the male extension worker should not go inside the compounds of the farmers unless especially invited. He should work with the senior active male of the family, because he is the chief decision maker. A native extension worker should normally know these things.

CHAPTER VI

EDUCATION AND MEANS OF COMMUNICATION

A study of the working of extension services in the United States reveals that the present methods of conducting extension education work are based on the educational levels of farmers. Another important basis is the level of development of the means of communication and mass media. County extension agents make extensive use of newspapers and other forms of the written word. Radio, television, and telephones are also intensively used to communicate new ideas and practices in agriculture. White found that an overwhelmingly large number of county extension agents and, according to them, their supervisors consider mass media of very much help in the conduct of educational activities with farm people.[1]

In the process of transferring the idea of extension service to other countries, the technical assistance agencies often make recommendations regarding the use of extension education methods which are based on experience gained in the United States and Europe. Recommended emphasis in the use of educational methods with the farmers in the underdeveloped countries is often the same as that found suitable for

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[1] M. E. White, The Wisconsin County Agricultural Agent and His Use of Mass Media (unpublished Ph. D. dissertation, Cornell University, 1960), pp. 231.

American farmers. Since the educational levels of farmers differ widely between the developed and underdeveloped countries, the methods of imparting necessary knowledge, skills, and attitudes should also vary. On the other hand, the level of development of educational organizations, institutions, and educational media is also different. Therefore, emphasis in the use of educational institutions and media should also vary. A major difference is in the level of development of educational organizations. For example, a newly established extension service does not usually have enough personnel to cope with the educational needs of rural people it is expected to serve. The levels of training of such staff are in no way comparable to the levels of training for similar personnel in the organizations of developed countries. Under such conditions, it is desirable to make use of other local educational institutions and organizations on a much greater scale than is made in the developed countries. This should be done in order to multiply the efforts of a comparatively smaller staff in underdeveloped countries.

One might expect that adoption of the idea of extension service by many other countries with different socio-cultural systems would bring about a comparable increase in the inventory of extension methods. However, the anticipated increase and development has not taken place. Instead, the American methods of extension teaching are being repeated in other countries with varying degrees of success. This indicates the need for experimentation and evolution of new extension methods suitable for non-literate, semi- and neo-literate farmers of the underdeveloped countries which are characterized by low levels of education, underdeveloped means of communication and mass media, and lower level insti-

tutional development related to extension education.

It was not within the scope of this study to experiment and develop new extension methods in the local situations and compare them with conventional educational methods, though it will make an excellant research project. However, it was considered pertinent that some observation be made about the present status of educational levels among the farmers and their educational interests. A study of existing educational institutions, organizations, educational media and facilities available was also considered necessary. It was assumed that on the basis of understanding gained from such knowledge, some areas and approaches could be pointed out for emphasis in extension work in Northern Nigeria. In brief, this chapter deals with the above-mentioned aspects.

Formal Education

Formal education becomes the basis for further adult and extension education. Therefore, an inventory of the formal educational facilities is important. It is pertinent because of the scope for the use of formal educational facilities in carrying out adult and extension education activities at the present time. Also it will give some indication of trends for future development.

Rural Schools

There are five Junior Primary schools in the area. Four of the schools are run by Zaria Native Administration and one is privately run by a mission group. The total number of students going to these schools is 385, of which 119 are girls. As compared to the total number of school age children, the proportion of children actually going to schools

in this area is very low. This emphasizes the need for increasing formal educational facilities to the rural areas in order to have a reasonably educated peasantry for future agricultural development.

The five primary schools in this area have a piece of land available as a school farm. The size of school farms varies from about 1/4 acre to 1 1/2 acres. Farming practices are taught to the school children. Two of these schools have teachers trained in rural science; others do not. The schools have been provided with funds to run the school farms. Only one school out of five used fertilizer and seed dressing last year. Other schools are not using any improved farming methods.

The school teachers were asked about the future of the children. They all agreed that only a few children will go to Senior Primary schools for further education; most of them will return to their homes to follow traditional professions. When asked about the value of teaching agriculture in schools, all head teachers seemed to realize the importance of teaching agriculture on scientific lines in the village schools, so that the students could become better farmers after they have left the school. The teachers also indicated that the students can help their parents learn new ideas which they may learn while still in school. They indicated that the parents like the idea of teaching agriculture in schools and often cooperate with school teachers.

Only one school was ever visited by an agricultural assistant and a cotton examiner. Both of them gave advice to school teachers on general agricultural matters. All of the five headmasters indicated they would like some advice from agricultural extension workers. Four of them showed preference for government agricultural extension workers,

on the assumption that the government extension worker would know more things than Native Administration extension worker . One of the headmasters preferred advice from the Native Administration extension worker on the ground that both of them belong to the Native Administration. Four of the schools have been receiving Ministry of Agriculture News Letters. One of the schools has a radio set. None of the schools at present has a rural youth club, but all of the head teachers indicated that they would like to organize one if they could get help.

Implications

The above findings show that in each of the five schools, facilities exist for teaching agriculture. The students are already doing farm work. Personal observations show that the students are not really learning new things. They are merely working as laborers. Knowledge of schools teachers about agriculture is poor, but they have shown willingness to cooperate and learn. Agricultural extension workers should pay periodic visits to rural schools in their areas to give advice on better farming practices to the teachers as well as children. The school is a good place to distribute written material so that children can take it home and read to their parents. There are possibilities to organize youth clubs in rural schools in order to prepare rural youth to become better future farmers. The cooperation of local school teacher may be secured in this respect. He can be involved as a volunteer local leader. The school farm can also be used as a place to give method demonstrations as well as to conduct result demonstrations. By using the rural schools in extension work, it is hoped that the local extension workers can achieve much better educational results than they now do.

Adult Literacy

The purpose of this work is to teach rural people reading and writing of Hausa language in English script. In Makarfi district at present there are 20 adult literacy centers. In each of these centers twenty-five students are taken during a session, and classes are run for five months. After completion of the course, either a new batch of students is taken or the center is moved to another village.

These centers draw a fairly good attendance during the dry season when farmers are not busy with farm activities. This also depends upon the interest of the local teachers. The day and time selected for holding the classes are decided by the local teachers. Classes are usually held in a community building. The teaching material and stationary are supplied by the Native Administration. It has been observed in these centers that the material supplied for teaching is inadequate. At the present time there is no follow-up work among the neo-literates to keep them literate or to help them improve further.

Discussion

Adult education centers can serve a useful function in teaching farmers how to increase farm production. The local extension worker should enlist the help of the district level adult education organizer and gain acquaintance with local adult education teachers and classes. These classes offer the extension worker a classroom teaching situation and a group of adult farmers. There are several ways in which the local extension worker can use these groups. Use of blackboard and visual aids such as flip chart and flannel graph can be made. He can organize the groups into study and discussion groups and thus help them learn new ideas in farming. These adult education centers need more reading

material which is interesting to read, is based on the interest of farmers, and is connected with practical aspects of rural life. The Ministry of Agriculture can produce simple illustrative pamphlets containing one or, at the most, two ideas and distribute them among the adult education classes and neo-literates. This way the Ministry can serve a useful purpose by spreading information as well as reinforcing the work of the adult education department.

Arabic Teaching

An important feature of village life in Makarfi district is the presence of a large number of Arabic teaching schools. Almost each central village and bigger hamlet has varying numbers of Arabic teaching schools organized on a voluntary informal basis either by local or by visiting Arabic teachers. After completing smaller schools, many students are sent to higher centers of learning in Kano and Bornu Provinces where they stay with Arabic teachers for a varying number of years and learn to read Holy Koran.

These schools are of a religious nature. It is doubtful whether they can be used for the teaching of agriculture. However, as a result of this teaching in the early years, a comparatively large number of adult males can be found in the villages who can read Arabic script. This offers a fairly good potential audience for the use of information material printed in Arabic. This idea has never been tried by the local extension service.

Educational Abilities of the Family Heads

An assessment of the educational abilities of 100 heads of the households from the above-mentioned three educational programs was

made. The results are reported in Table 9:

TABLE 9

READING AND WRITING ABILITIES OF 100 FAMILY HEADS ACCORDING TO TRIBE

Particulars	Total in the sample	Muslim settled "Hausa"	Pagans	Cattle Fulani[2]
	Percentage of family heads			
Reads nothing, writes nothing	47	39	100	60
Reads Arabic only	9	8	-	20
Reads and writes Arabic	36	43	-	20
Reads and writes Arabic and Hausa	8	10	-	-

All of the Pagans in this study are illiterate and, comparatively, a large group of cattle Fulanis are also unable to read and write when compared with settled farmers.

There are differences in opportunities available for education according to the location of the farmers which are reflected in the educational levels. Table 10 (see following page) indicates that a greater proportion of farmers who are located in the main central villages can read and write as compared to the farmers who live in the smaller hamlets or single households out of the main villages.

From these findings it can be implied that written material can be used to advantage in the central villages, whereas the best method for working with the farmers living outside the main villages will be personal contact. Distance is a factor which even the extension worker has to keep in mind. He will find it extremely difficult to contact all

[2]Learning of Arabic is very highly prized among Fulanis.

people outside of the main village. To overcome this difficulty, his approach should be geared to the places where he can make contact with many such people at one time. Rural markets afford this opportunity for contact, because markets are attended also by people from the hamlets. The use of volunteer leaders will be another effective method for the extension worker to increase and multiply his efforts in the hamlets. The possibilities of finding a progressive villager and training him as a volunteer leader in each hamlet should be looked into. The legitimizing function of the hamlet or ward-head may also be utilized to approach these farmers.

TABLE 10

READING AND WRITING ABILITIES OF 100 FAMILY HEADS ACCORDING TO LOCATION

Particulars	Total in the sample	Farmers living in main villages	Farmers living out of main villages
	Percentage of family heads		
Reads nothing, writes nothing	47	40	61
Reads Arabic only	9	8	11
Reads and writes Arabic	36	40	28
Reads and writes Arabic and Hausa both	8	12	-
Total farmers	100	67	33

Reading Habits and the Actual Use of Written Material

From the village survey records it was found that out of thirty-two villages in the area, twenty-nine villages had at one time received some reading material from the outside. The items mentioned were local newspapers such as Jakadiha, Bazazzaga, Gaskiya Tafi Kwabo,

Daily Times (in one village), News Letter from the provincial Ministry of Agriculture, posters, small pamphlets, and Arabic books. Many villages received more than one kind of the above material.

Table 11 indicates the relationship between the location of the villages and the availability of reading material:

TABLE 11

AVAILABILITY OF DIFFERENT TYPES OF READING MATERIAL ACCORDING TO THE LOCATION OF VILLAGES [3]

Combinations of reading material available	"Points of Contact" villages	Villages within 4 miles from "Points of Contact"	Villages within 6 miles from "Points of Contact"	All villages
	Number of villages			
No reading material received	--	1	2	3
One type of material received	--	2	4	6
Two types of material received	2	6	1	9
Three types of material received	2	3	5	10
Four types of material received	--	1	1	2
Five types of material received	1	--	--	1
Six types of material received	1	--	--	1
Total villages	6	13	13	32

There is no relationship between the location of the village and the number of types of reading material received in the village.[4]

[3] For location of the villages included in each category, see Chapter II, pages 28 and 29.

[4] The Chi Square value of this table is 16.34. At 12 degrees of freedom the Chi Square value at 5% level of significance is 21.26. Therefore, the relationship is rejected.

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Two types of material received	2	6	1	9
Three types of material received	2	3	5	10
Four types of material received	--	1	1	2
Five types of material received	1	--	--	1
Six types of material received	1	--	--	1
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On-the-spot inquiries indicated that this material does not come to the villages regularly. Interested villagers may buy the newspapers when visiting Zaria city and take them to the villages. The News Letters of the Ministry of Agriculture have been received in 20 villages. It was distributed by the government and Native Administration officials. Posters and pamphlets also reach the villages through officials of various agencies working in the villages. Arabic books are sold in the markets.

During the survey it was discovered that, of the 29 villages which receive reading material, other people listen when a literate farmers reads in 21 villages. Reading is usually done in common places in the village streets. It may be near the village head's house, near the Mosque, or near the market place. Thus, the information contained in the paper is shared with others who cannot read. The people who read the written material to other villagers were mentioned as "local people," "school children," "ex-adult education students," 'adult education teachers," and, in one village (Hunkuyi) in addition to the above persons, "government workers," and "school teachers" read the material to the village people. Hunkuyi is a big village on the roadside and it is the closest village in this area to the city of Zaria. Government officials from almost all of the departments visit the village frequently.

It has been mentioned that, in a sample of one hundred family heads, fifty-three can read Arabic and/or Hausa. They were asked if they buy any reading material. The responses are given in Table 12 (see following page).

TABLE 12

READING MATERIAL BOUGHT IN MAKARFI DISTRICT BY LITERATE FAMILY HEADS

Particulars	Total in the sample	Do not buy any books	Buy reading material: Arabic books only	Buy reading material: Hausa and Arabic books only
	Number of family heads			
Cannot read and/or write	47			
Can read and/or write	53	15	33	5
Can read Arabic only	9	6	3	-
Can read and write Arabic	36	8	28	-
Can read and write Arabic and Hausa	8	1	2	5

Discussion

From the above data it appears that simple written material has a better chance of reaching rural people than is generally believed. Since most of the literate people live in the main villages and there is a greater number of people who can read Arabic script as compared to the people who can read Hausa in English script, it will be worthwhile to prepare simple illustrated material in Arabic containing one or two ideas per piece and then make sure that this material is distributed properly in each central village. Arabic script has sentimental and religious appeal. It has been seen that the villagers appreciate receiving material in Arabic and read it with great deal of interest. The pamphlets produced by the North Regional Marketing Board were informally tested in the villages by the writer for readability and interest. Farmers having four to five years of education in Arabic were able to read the Arabic part of the pamphlets with facility. An indication of

of the interest of farmers is given in Table 12, which shows that a substantial portion of the literate farmers already buy the material to read. These are indications that the information material produced by the Ministry of Agriculture will be read with interest, provided it is produced with care. At the present time, the Provincial News Letters issued by some of the provincial Agricultural Officers are in English script. It is expected that the Ministry of Agriculture can extend its potential audience for News Letters if an edition of the provincial News Letters is produced in Arabic for areas where Arabic script can be read.

Since the villages near the roadside already use written material, more emphasis should be given to the distribution of such material in these villages. It is also suggested that better distribution and coverage can be expected if the help of other agencies, engaged in rural areas, is enlisted as compared to distribution by the Ministry of Agriculture only.

The Use of Radio in Makarfi District

The importance of radio as a medium of communication cannot be overemphasized. Radio has been and is being used all over the world as a medium for spreading agricultural information. In many countries extension workers are making extensive use of the radio programs for educating farmers. Television is another such medium which is of good value to agricultural extension work; however, in Northern Nigeria the use of television in agricultural extension work will have very limited scope for at least another ten or fifteen years, unless T. V. sets are distributed free in the villages. So far, radio seems to be very useful. Hence, it was considered important to make some inquiries about the present

status and use of radio, keeping in view the possibilities for future development.

Radio Sets Available in the Villages

At the beginning of 1962, there were 63 radio sets in Makarfi district. If it is assumed that all the radio sets are working properly and that everybody has an equal chance to listen, there was one radio for about every 1,300 persons. Actually this figure is very misleading because some of the radio sets were not in working order. Most of the existing radio sets are located in the central villages and people in the hamlets have very few radio sets. Many of these radio sets are privately owned and in some of the cases of privately owned radios, listening is limited to family members, friends, and relatives. Therefore, the actual number of radio listeners per radio will be very small. Table 13 gives some data about the ownership and location of radio sets in Makarfi.

TABLE 13

DISTRIBUTION OF RADIO SETS ACCORDING TO THE LOCATION OF VILLAGES

Categories of villages	Total no. of villages	Villages without radio	Radio Sets in the Area		
			Total	Given by N. A.	Privately owned
Point of contact villages	6	0	32	6	26
Category B village	13	2	14	6	8
Category C village	13	5	17	4	13
Total	32	7	63	16	47

The table shows that there are more radio sets in the villages designated as "points of contact." Every village in this category has a

status and use of radio, keeping in view the possibilities for future development.

Radio Sets Available in the Villages

At the beginning of 1962, there were 63 radio sets in Makarfi district. If it is assumed that all the radio sets are working properly and that everybody has an equal chance to listen, there was one radio for about every 1,300 persons. Actually this figure is very misleading because some of the radio sets were not in working order. Most of the existing radio sets are located in the central villages and people in the hamlets have very few radio sets. Many of these radio sets are privately owned and in some of the cases of privately owned radios, listening is limited to family members, friends, and relatives. Therefore, the actual number of radio listeners per radio will be very small. Table 13 gives some data about the ownership and location of radio sets in Makarfi.

TABLE 13

DISTRIBUTION OF RADIO SETS ACCORDING TO THE LOCATION OF VILLAGES

Categories of villages	Total no. of villages	Villages without radio	Radio Sets in the Area		
			Total	Given by N. A.	Privately owned
Point of contact villages	6	0	32	6	26
Category B village	13	2	14	6	8
Category C village	13	5	17	4	13
Total	32	7	63	16	47

The table shows that there are more radio sets in the villages designated as "points of contact." Every village in this category has a

radio set, whereas two villages in category B and five villages in category C do not have radio sets. More of category C villages do not have a radio set as compared to category B villages. However, in the remaining villages more radio sets per village exist in category C than in category B villages. The reasons for such difference are not known.

All of the points of contact villages have one radio set each given by the Zaria Native Administration as a community listening set. More of category B villages had Native Administration community listening sets than the category C villages. There are many privately owned radio sets in "points of contact" villages. Among the two other categories of villages, there are more privately owned radio sets in category C villages than in category B villages.

Inquiries were made about whether the radio receiving sets are in working order and in use. It was found that seven of the sixteen sets given by the Native Administration were not in working order at the time of the study. The reasons mentioned were such as "battery has exhausted" and "nobody buys a new battery" or "the radio set needs repairs" or "the license has not been renewed."[5] This is a problem peculiar to community listening sets only. Privately owned sets are regularly serviced and kept in running condition. In the case of community listening sets, no adequate arrangements are usually made for maintenance and upkeep before the radio sets are distributed. The difficulties and points discussed above should be kept in mind when planning

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[5]In Northern Nigeria the radio receiving sets cannot be owned and operated legally unless a license from the Ministry of Communications is obtained.

a future program for the distribution of radio sets. Otherwise the objectives of such a community listening and communications scheme will not be fully achieved.

Future Prospects

Radio appears to contribute a great deal to the process of social change. Apart from being a medium of communication, it is also a symbol of status in the villages and farmers aspire to buy radio sets. Inquiry indicated that the first radio was brought into this area about ten years ago; however, most of the present radio sets found in the villages were brought in within the last five years. This indicates that an increase in the number of radios in the rural areas of Makarfi may be expected in the future.

Listening Habits and the Programs Liked

In most cases rural people listen to radio in the afternoon and evenings. The two main radio listening times indicated were 1:00 p. m. to 3:30 p. m. and 7:30 p. m. to 9:30 p. m. Of these two periods, 7:30 p. m. to 9:30 p. m. was most often mentioned. The places where rural radio sets are played are, in the case of community listening sets, the "village head's Zaure"[6] and "adult education classroom." In the case of privately owned sets, the places mentioned were, "a Zaure," "near the market place," "played inside the compound," and "played in the shop."

Village groups were asked what kind of programs they usually

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[6]Zaure is a Hausa word. It is used to denote the entrance hut to a family compound. The male family head usually entertains his male friends in Zaure. Outsider males do not go beyond this point, until invited by the male head.

listen to on the radio. The programs mentioned were as follows: Regional news in Hausa (23 mentions), agricultural programs when on the air (21 mentions), Hausa songs and music (19 mentions), religious programs (7 mentions), and Indian music (1 mention).

The Extent and Interest of 100 Family Heads in Radio Listening

One hundred heads of households in this study were asked if they had ever listened to any kind of radio program. Seventy-eight had never listened to any programs, while twenty-two had listened to one or more. Of these twenty-two, only one person owned a radio set. Others had listened to a neighbor's radio (2 mentions), relative's radio (2 mentions), village head's radio (5 mentions), another farmer's radio (12 mentions), and one farmer had listened to a radio in another village.

TABLE 14

OPPORTUNITIES TO LISTEN TO RADIO AMONG 100 FAMILY HEADS ACCORDING TO TRIBE AND LOCATION

Tribal groups	Total in the sample	Has listened to radio		
		Total	Live in main village	Live outside main village
	Number of family heads			
Settled Muslim "Hausa"	80	20	18	2
Pagan Hausa	10	2	-	-
Cattle Fulani	10	-	-	2*
Total	100	22	18	4

*Had listened to radio on their visit to central villages.

The heads of households were asked if they had ever listened to any agricultural program. Two of the twenty-two said they had never listeded to an agricultural program. Seven of them indicated that they had listened to "Kasa Mai Albarkha." Eight indicated that they had

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listened to "Sarkin Noma." Five of them reported that they had listened to both the above reported radio programs.[7]

Discussion of Implications

These data indicate that a large portion of both village groups and individual farmers who had listened to a radio had also listened to agricultural programs. This indicates interest in learning things about agriculture. It also indicates the need for further distribution of radio sets in the rural areas through the respective Native Administrations. They can be distributed either as community listening sets at the community level or in the form of subsidized radio sets for individual farmers. The need for a well-rounded radio program for rural listeners on a regular daily basis is evident. Such a program should be worked out by the Ministry of Agriculture in cooperation with the Nigerian Broadcasting Corporation. The program should be composed of Hausa music and songs, news in Hausa, and religious programs sandwiched between information on current topics of agricultural interests. The appropriate time for such a program is about 7:30 p. m. for this area. It is hoped that such a program will communicate information of a general agricultural nature. This will reinforce the work of extension workers and vice versa. Since the rate of literacy is very low, word of mouth istill remains the most important means of communication in Northern Nigeria. The

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[7]"Kasa Mai Albarkha" and "Sarkin Noma" are the titles of two different radio programs broadcast from the Nigerian Broadcasting Corporation's Kaduna station. Sarkin Noma was the first one to be on the air. It was stopped, and then Kasa Mai Albarkha was started. The programs were broadcast once a week. Kasa Mai Albarkha was on the air when the writer was in the country. Recent information shows that it has been stopped. This program was sponsored by the North Regional Marketing Board in order to do publicity work for the Board and to help producers in preparation of crops for marketing. Both of the programs were in Hausa language only.

number of extension workers is very small. It will, therefore, be very useful if the efforts of extension workers are supplemented with information through a radio program as suggested above. Provincial offices of the Ministry of Agriculture should use the local radio stations in order to communicate with the farmers in local languages.

CHAPTER VII

MEANS AND METHODS OF MAKING A LIVING

An attempt was made to find the division of farm and nonfarm population in the area studied. Questions were asked the respondents designed to discover the ways and means by which the rural people make their living. It was discovered that everybody in Makarfi district is a farmer. In addition to farming, the rural people pursue a variety of additional nonfarm profession to supplement their income and in order to utilize their spare time. In the pages that follow a description of the major methods of making a living are presented.

Aspects of Agricultural Production

A brief description of the ecology of the area has been given in the preceding chapters. In this part, more specific aspects of agriculture will be discussed.

Contrary to popular opinion, it was discovered that the ten cattle Fulanis included in this study were cultivating land during 1961. This was in addition to their traditional profession of herding and tending cattle. Previously it was believed that the only source of income for Fulanis is their cattle. From the sale of cattle, milk, and milk products they make money and buy necessities of life. The data in this study disproves this assumption.

Cultivation of land means settling in one place, at least for a part of the year (wet season). This is possible for them, because during the wet season there is enough grass and pasture in the area that the cattle do not have to be moved long distances for grazing. They usually have a temporary home for the wet season in one place, where they cultivate a newly reclaimed piece of bush land. They may leave this temporary home forever after the harvest or may use it again during the next wet season.

Inquiries were made about the crops grown by these cattle Fulanis. Nine respondents of the ten reported having grown both cash and food crops. The tenth family had grown food crops only. If this is universal for all cattle Fulanis, it indicates that the incentives of cash crops cultivation (cotton, groundnuts, pepper) have caught up with these semi-nomadic people. It has also been found that the Fulanis only cultivate uplands during the wet season. None of the Fulanis was found to cultivate fadama land. There is not enough grass in this area during the dry season, so they have to move their cattle to the south. Fadama cultivation conflicts with their main profession of herding.

Among the remaining ninety settled farmers, everyone farmed land during the wet season. Dry season cultivation of land is limited to fadama farms, where irrigation is practiced mostly by Shadoofs.[1] The extent of fadama cultivation varies from village to village depending upon the size of fadama land available for cultivation. Since the ratio

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[1]A Shadoof is a simple mechanism designed locally in order to lift water from the depressions. The mechanisms involve a long lever on whose one end is tied some weight. On the other end is tied a rope and bucket. The bucket is filled by lowering the bucket end of the lever. Filled bucket is lifted with the help of weight on the other end of the lever and is emptied in the irrigation channel.

of fadama farms to upland farms is low, there is not enough fadama land for every farmer. Preference of farmers to do other jobs during the dry season and the comparative advantage of fadama cultivation as compared to other opportunities available are some of the other factors which govern the cultivation of fadamas.

TABLE 15

WET AND DRY SEASON CULTIVATION BY TRIBES

Name of tribe	Total in the sample	Doing wet season cultivation	Doing dry season cultivation
Hausa Muslim	80	80	53
Pagan Hausa	10	10	1
Cattle Fulani	10	10	–
Total	100	100	54

Comparatively more Muslim Hausa farmers cultivate fadama lands in this area. Fulanis and Pagans do very little dry season farming.

The cultivation of fadama farms may not be an indication of the total wealth being produced by these groups of farmers. Fadama farms are usually smaller in size. However, the advantage of fadama cultivation is that a farmer can utilize his own labor throughout the year and raise cash during that part of the year, when he does not have anything else to sell from other farms.

Farm Lands

There is no detailed soil and land classification available in Nigeria. Local people classify lands according to several criteria. One is the distance from the homestead to the village. Farms are generally classed as: a) farms near the home, and b) farms away from

the home. The second criterion is the topography. Topographically, the farms are classified as upland farms and fadama farms. Fadama farms are again divided into two classes according to their drainage: a) ordinary fadama lands with reasonable drainage, and b) poorly drained fadama land (called Kwari in the local language). The third criterion for classifying land is the fertility level. The local people differentiate three fertility levels.

a) Bakar Kasa, which is the most fertile soil, is characterized by dark color.

b) Farar Kasa is the next fertility level. It is lighter in color than Bakar Kasa and is lower in fertility.

c) Jar Kasa is the poorest of all. It is characterized by very light color.

Farm Size[2]

At very few places in Northern Nigeria has the size of peasant farms been studied. In this study, the fields of each farmer in the sample was measured by a trained surveyor. One hundred households in this study owned and cultivated 698.5 acres of land during the crop year of 1962. Therefore, the average size of land holding is about seven acres per family. The range of acreage cultivated by the farmers in this area is from 1.08 to 31.60 acres. The figures for similar other areas in Nigeria are not available for comparison. Luning[3] has done some work to find out the size of holdings in northern parts of Northern Nigeria, but the data are not available. Galletti, et al. computed figures for family land holdings in a research project they did on

[2]Data on farm sizes were supplied by the Agricultural Economist of FAO Socio-Economic Survey for Peasant Agriculture Team through personal communication.

[3]Luning, op. cit.

cocoa farmers in Western Nigeria.[4] In their case the average size of cultivated holdings was about 14.3 acres per family. Cocoa growing areas of Western Nigeria are located in a different vegetation zone and the economic levels of cocoa farmers are much higher than the farmers in Makarfi district. Therefore, this comparison has no meaning. The following table gives the distribution of land holdings among 100 farmers in the area studied.

TABLE 16

FREQUENCY DISTRIBUTION OF THE SIZE OF LAND HOLDINGS

Farm Size	Number of cases
Two acres and under	7
2.1 to 5 acres	43
5.1 to 10 acres	29
10.1 to 15 acres	14
15.1 to 31.6 acres	7
Total	100

There is variation in the size of holding per family from village to village. Some villages have higher average size of holdings per family than others. For example, the average size of the holdings in Hunkuyi and Lafia is the smallest (3.9 acres). The highest average acreage held per family is in the village of Likoro (12.6 acres). There emerges no pattern in the size of land holding per family, as is clear from Table 17 (see following page).

There is a difference in the size of land holdings between farmers who live in the main villages (average size per family, 6 acres),

[4]The figure has been computed from Appendix Table XV in Galletti, R., and K. D. S. Baldwin and I. O. Dina, Nigerian Cocoa Farmers (London: Oxford University Press, 1956), p. 637.

and those who live outside of the main villages (average size, 9 acres per family). The tribal distribution of average land holdings indicates that the Pagans have the highest average size of holding, 14.48 acres.[5] Cattle Fulanis have 6.8 acres per family, and the "Hausa" people have an average of about 6 acres per family. The socio-economic strata of the sample also differ in the size of holdings. Farmers who are also big traders have higher acreage holdings (average 8.6 acres per family). Political title holders have an average of 7 acres per family. The average size of land holdings for other farmers was much smaller.

TABLE 17

SIZE OF AVERAGE LAND HOLDING PER FAMILY ACCORDING TO THE LOCATION OF VILLAGE

Category	Name of village	Average Holding per family	
		acres	
A	Hunkuyi	3.9	
A	Makarfi	6.7	
A	Likoro	12.6	
Average holding per family			6.8 acres
B	Dan Dako	5.3	
B	Kaura	10.4	
B	Dan Guzri	4.4	
B	Gazara	5.6	
B	Durum	11.2	
Average holding per family			7.4 acres
C	KwataKwari	7.7	
C	Doryi	11.8	
C	Mahuta	4.13	
C	Lafia	3.9	
C	Gwanki	8.1	
C	Mayare	4.9	
Average holding per family			6.6 acres

[5]This is probably due to the bigger size of labor force in the families, because Pagan women work on the farms. Another possible reason is their dependence mainly on cultivation of uplands which can not be cultivated throughout the year.

Cultivation and Ownership of Land

Rural people of Makarfi district perceive the ownership of land in different ways at different levels. If the question is asked of the District Head: to whom does the land in the district belong? he will say, "It belongs to the Emir." At the community level, the village head will say that the land in the village belongs to the District Head. Some individual farmers will say that the land cultivated by them belongs to the village head; others will say that it belongs to them. At the community level the village head is in charge of allotting new pieces of land to the newcomers or to the old residents of the village. Theoretically, he can oust any farmer from his piece of land and give it to another, but this rarely happens.

Ninety-five per cent of the families in this study owned a piece of land for cultivation. The other five families rented land from others. Three of these five families were cattle Fulani, while the other two were Hausa. Four of the five were new in-migrants. In cases where land is owned, the head of the family usually owns the land. In cases of Pagans, in nine of the ten families, wives owned and cultivated their own farms. The tenth wife did not own any land, but she had the right to cultivate her husband's farm.

Fragmentation of Land Holdings

As a result of customs of inheritance and acquisition of land, the holdings in Makarfi district are very much fragmented. Farmers were asked questions about the number of pieces being cultivated by each of them. The results are given below for three types of farms:

TABLE 18

NUMBER OF FARMS IN EACH CASE OF LAND TYPE

Number of farms	Upland farms away from the compounds	Upland farms near the compounds	Fadama farms
Do not own any farm	7	67	46
Own one farm	12	26	34
Own two farms	35	4	15
Own three farms	27	0	5
Own four farms	15	1	0
Own five farms	3	1	0
Own six farms	1	0	0
Own eight farms	-	1	-
Total	100	100	100

Farmers' difficulties in cultivating their many farms are further accentuated by the distance of their farms from the household. The farms are scattered around the villages at various distances and farmers usually spend a great deal of time walking to and from the farms. To overcome this difficulty some farmers move their households near the farms. Many farmers have begun to invest money in bicycles in order to save time and energy spent on commuting.

Decision Making for Crop Growing

In families where women do not own land, the family head is the owner of the land and he usually makes all of the decisions about planting crops. In five cases in this study, he shared the decision-making function with his wife in three cases, son and wife made the decision in one case, and brothers decided in another case. In the case of Pagan families, the women own the land and make their own decisions.

Relative Importance of Different Farm Lands

During the course of the study, the farmers were asked to indicate the gross cash incomes received during the last crop season from upland and fadama farms. The average cash income reported from fadama farms was a little higher than the cash income received from uplands.[6] If so, this indicates the importance of fadamas as a source of cash income. It has been mentioned previously that most of the food crops are grown on upland farms, and fadamas are exploited chiefly for cash crops. Fadama cultivation is carried out in the dry season, when there is no work on the upland farms. Fadamas, a source of cash income, also add to the nutrition of the local population because vegetables can be grown on them in the dry season.

Discussion

The most important factor in fadama cultivation is the lack of water. In some fadamas, considerable water flows during the earlier part of the dry season. The farms do not store water in the central channels by making simple dams. Thus, water available during the early part of the year flows away. This causes a shortage of irrigation water during the latter part of the dry season. The present practice of lifting water for irrigation is time consuming.

Expert knowledge of irrigation engineering should contribute toward better storage, lifting and use of water on the fields. The idea of

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[6]The figures reported were from memory and were rough gross cash incomes. Because of the problems involved in remembering the exact figures, such data will not be of any further analytical value. However, for a rough indicator as required here it should be reasonably good. The figures were compared only for those farmers in the sample who cultivated fadamas.

self-help, in order to promote minor irrigation works, can be tried. Expert knowledge and specialized equipment can be given by the Government or Native Administrations, while local people can be involved by asking them to contribute labor and locally available material. Such an activity will add to the income of the farmers, because it will bring more fadama land under cultivation. However, where no alternative economically-feasible possibilities for storage and lifting of water exist, the cultivation of fadama land may be encouraged through the use of Shadoofs.

Farm Operations and Responsibility for Performance

During the field phase of this study, inquiries were made about farm operations carried out by the farmers. It was endeavored to find out who performs a particular operation on the farm in terms of male and female and in terms of family and hired labor. During which time of the year the operation is performed and which tools and implements are used were some of the other things asked. Table 19 gives detailed information about the responsibilities of male and female members and the use of hired labor in each farm operation. (See following page.)

Implications for Extension Education

An inspection of Table 19 reveals that some jobs on the farm are being performed predominantly by males whereas other jobs are performed predominantly by women. In almost all the jobs, some women have been reported participating. This is true of Pagan families where women work on the farms along with men and perform all operations. In other cases where women work on the jobs otherwise predominantly done by the male members, it indicates a shortage of

male familylabor, inability to hire labor, or the fact that women are not in seclusion.

TABLE 19

RESPONSIBILITY FOR PERFORMING FARM OPERATIONS

Operation	Did not do last year	Person who performs (% of families)					
		Family Labor			Hired Labor Helped		
		Male	Female	Male & Female	Male	Female	Male & Female
Clearing and burning bush	-	76	-	9	15	-	-
Making ridges	-	63	-	11	26	-	-
Sowing crops	-	56	19	18	7	-	-
Weeding	-	64	-	12	24	-	-
Earthing up	-	66	-	11	23	-	-
Harvesting of							
Millet	2	75	-	10	13	-	-
Guinea-corn	-	73	-	10	17	-	-
Groundnuts	14	63	-	9	11	3	-
Cassava	72	21	-	2	2	-	-*
Sugarcane	64	9	-	1	-	-	-**
Sweet potato	58	35	1	5	1	-	-
Cotton picking	29	3	10	15	3	40	-
Cow peas	14	14	17	17	-	38	-
Compound manure:							
Preparation	-	70	14	16	-	-	-
Transport	-	74	-	5	21	-	-
Application	-	84	-	10	6	-	-

*In the remaining three cases, cassava was sold while standing in the field.

**In 26 families, the sugarcane crop was not harvested by the family members. It was sold in the field. This proportion is 73 per cent of the sugarcane growers.

Among the farm jobs performed predominantly by males are clearing and burning bush, making ridges, weeding, earthing up, harvesting of millet, guinea-corn, groundnuts, cassava and sweet potatoes, sugarcane (where done within the family), and transport and application of farmyard manure.

Among the farm jobs in which women participate to a greater degree are sowing crops, picking cotton and cow peas, and conservation of farmyard manure. Milking of cattle and preparation of milk products are the jobs done by Fulani women.

These findings have implications for extension programs. In a Muslim society, it is impossible for men extension workers to contact farm women. It will be worthwhile to affect improvements, in those spheres of agriculture where women take a greater part, through a home economics extension program. These things can be included in the training program of home economics extension agents in addition to their training in conventional home economics subjects. Or, if this is not possible, the men extension workers should work through the family males to affect improvements in spheres where women take more prominent part . An exploration and study of the responsibility for farm operations in general has clarified the subject matter areas to be included in home economics and agriculture extension programs as well as for the training of extension agents.

Farm Jobs Not Being Performed by the Families

Harvesting of Sugarcane -- A majority of sugarcane growers sell their crop while it is still in the field. The traders buy and harvest sugarcane with hired labor. There are two methods of utilizing the sugarcane crop. It is either harvested and sold in the form of canes for chewing in the local markets and in the towns, or converted to brown sugar at site and sold in this form. The farmers sell their crop standing in the field because they do not have the necessary capital, skills, knowledge, and contacts required to process and sell their sugarcane or sugar.

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Sugarcane is a bulky crop and transport facilities seem to govern its production in Makarfi district. It is mostly grown in fadamas comparatively closer to the roads, so that the crop may be transported by trucks. Inquiries have indicated that sugarcane growers near the roads get much better prices than those who are farther away. In the villages farther from the road, fadama lands are not fully exploited for sugarcane cultivation. At the present time all sugarcane grown in the area is soft, grown mainly for chewing. Crushing is of secondary importance in the minds of growers. On the other hand, the market for chewing cane is limited by the nature of its consumption. This indicates the need for introduction of a better yielding, red rot resistant sugarcane which can be crushed.

To enable the farmers to process their own sugarcane into brown sugar will require an educational program in "how to grow better sugarcane" and "how to process it." To provide the necessary equipment for boiling juice and converting into sugar will require a credit program so that farmers may be able to buy crushing sets on cooperative basis. Such a program will affect the utilization of unexploited fadama lands as well as better utilization of farmer's time. Sugarcane is planted as well as crushed in the dry season, when most of the farmers do not have much work on other farms. An informal inquiry into the sugar making industry of the Makarfi district in 1956[7] indicated that,with the existing soft cane varieties of sugarcane, and with the existing methods of production and conversion, traders made a net profit of seventeen shillings per day per crushing set. If farmers are taught to make sugar and are

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[7]Refer Agric. Note Book of Makarfi district, observations on sugarcane industry in Makarfi area. Ministry of Agriculture, Zaria, 1956.

helped to buy equipment, they can save on their own labor in addition to this net profit. Introduction of a sugarcane crushing program, even with the existing varieties, will bring an increase in the total area and yield of sugarcane and thus contribute to the farmers' income. Farmers in the more distant villages will grow it more because sugar is much easier to transport than cane. A great deal of improvement in the methods of sugarcane growing and processing is needed. A large scale program of introduction and improvement of local village sugar industry in the Northern Region, if considered, should also involve the protection of local industry by the government, either in the form of increased tariffs on imported sugar or price supports for the locally produced sugar.

Shelling of Groundnuts.-- About 60 per cent of the groundnut growers sell their groundnuts unshelled. Traders and middlemen buy unshelled groundnuts from the farmers and then sell them on the rates fixed by the Marketing Board. It is quite difficult for a farmer to estimate the amount of kernel from the unshelled groundnuts; hence, the price paid to the farmers tends to be low. About 40 per cent of the farmers in this study reported that they shelled their groundnuts, usually on a hired groundnut decorticator. This happens in cases of more alert farmers as well as in the villages where somebody owns a decorticator. The main reason why so many of the farmers sell their groundnuts unshelled, among other things, is the lack of decorticating machines. This indicates a need for credit programs to enable the farmers to buy more groundnut decorticators.

Farm Supplies

Provision of adequate quality and quantity of supplies that go along with the improved practices and recommendations are an important part of agricultural development work. Improved seeds and seedlings, fertilizers and manures, implements and insecticides form an essential part of agricultural production. It should be noted that the programs for agricultural development include, among tother things, proper channels for provision of all agricultural supplies.

In order to find the present position with regard to farm supplies and the ways in which farmers secure them, it was considered necessary that an inquriy on such items as seed, fertilizer, implements and insecticides may be included in this study. An inspection of the interview schedule should reveal that the questionswere asked on each individual item of requisites needed by the farmers in order to support their present levels of production. The summary of the results obtained is given in the pages that follow.

Farm Seeds

Introduction of new varieties of crops, replacement of the old varieties and improvements in the methods of selection, storage and preparation of seeds are often important activities of agricultural extension workers in newly developing programs. In order to bring about improvements in the existing ways and methods, the extension workers must study the patterns already followed by the farmers. Table 20 gives an account of the methods of acquisition of seeds by the farmers in the area studied.

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TABLE 20

SOURCES OF PROCUREMENT OF SEEDS BY 100 FARMERS IN MAKARFI DISTRICT, 1961

Name of Seed	Did not grow in 1961	Stored	Borrowed or got free from other farmers	Bought from market	Free or bought from government or N. T. C.**
	Percentage of farmers				
Food Crops					
Guinea corn	-	86	3	11	-
Millet	1	74	16	9	-
Cassava	24	35	22	19	-
Sweet potato	47	32	18	3	-
Rice	91	3	3	3	-
Cash Crops					
Groundnuts	14	21	2	63	-
Cotton	29	-	3	6*	62
Tobacco	91	-	-	3**	6
Pepper	65	18	9	8	-
Potatoes	97	1	-	2	-
Onions	88	4	2	6	-
Sugarcane	64	15	2	19	-

*Cotton seed is supplied by the government free of charge. Some farmers have still bought the seed. Farmers near the seed stores procure cotton seed free from the government in excess of their requirements and later sell it to the farms from distant villages who cannot get to the government seed store in time.

**Tobacco seed is also distributed free of charge by the Nigerian Tobacco Company, a private firm, which also does tobacco extension work.

Responsibility for Procuring Seeds in the Rural Family

The responsibility for the procurement of all kinds of seeds is of the male members of the rural families. The male head of the household is responsible for getting the seed. In his absence or in case of a few families even in his presence, the seed may be procured by his brother or son.

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Discussion

It may be seen from the description of the procurement of seeds that, as a general pattern, seeds for food crops are stored by the rural families in a majority of cases, whereas in the case of cash crops a comparatively larger percentage of farmers buy their seeds from the market or from other farmers. The data also indicate that there is considerable lending and giving away of seeds. The seeds are given away to friends and relatives when the seed is in surplus and the quantity required is very small. This is more prevelant in the case of food crops.

In the case of farmers who buy their seeds, there are two sources available to them. The first source is the local farmers, who usually sell their own surplus seed to other farmers. The seed in this case is selected and kept as seed originally. The other source of seed is the local market. In this case the farmer goes to the market at sowing time and buys whatever he can get. The crops sold in the markets are not primarily kept as seed; they are consumed. The quality is very poor and the prices high at sowing time.

A large number of farmers buy their seed for cash crops. Under such circumstances it should not be difficult to introduce new varieties of seed through controlled local trade channels or through selected local farmers, provided the prices quoted are not too high and farmers are convinced of their superiority. Since the problem of seed multiplication and distribution is perennial and often requires an increasing amount of effort, time, and money from extension services, it will be desirable that the efforts of extension staff are duplicated by shifting some responsibility to farmers and local traders. It should be the general policy to limit the activities of the extension staff in this field to the minimum.

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The Ministry of Agriculture staff should keep the multiplication of seeds with it up to first and second stages. From then onward, the extension workers should take up this work and promote it through educational means. It might be worthwhile to select one or more progressive farmers in each village or a group of villages and distribute pure seed to them through extension service. Extension workers should work closely with these farmers and educate them about all aspects of seed multiplication. The extension agents should also use these progressive farmers as model farmers in order to convince the other farmers about the desirability of adopting this new seed and the methods of growing it. At the end of the season the other farmers may be encouraged to exchange their old seeds with the new seed grown by the progressive farmers at a higher rate of exchange. Exchange method will also work very well in the case of food crops. Every now and then these selected farmers can be supplied with new seeds by the Ministry of Agriculture to replace the old ones.

Farm Tools

In this study it was considered necessary to collect some information on the equipment that farmers use to make their livelihood out of land. The garma, fartanyan, maigirbi, adda, lauje, wuka, axe are the tools used in carrying out farm operations with human labor. In addition to these, some cane crushers, groundnut decorticators and weighing balances were found in use in the area. In the households interviewed, it is the responsibility of the head of the family to procure and arrange for the farm tools.

Discussion and Implications

No mechanical or animal power is being used for draught purposes in the performance of agricultural operations in this area. All farm operations are being done by human labor and with locally made tools. Farm tools are usually made by the village blacksmiths from scrap iron and locally available wood. Almost in each central village there are one or more families of blacksmiths who make tools required by the farmers. Surplus production is taken to the rural markets for sale to the farmers who do not have ready access to the blacksmiths in their own villages or hamlets. Designs of most of the hand tools are very old but seem to be quite well adapted to the work habits of farmers. On the other hand, the working efficiency of these tools is low. The farmers are very hard pressed for labor all through the wet season and especially during peak demand periods.[8]

The farm operations will be performed with human labor for some time to come, because such a situation is very difficult to change in a short period of time. This indicates the importance of improving the design of farm hand tools in order to increase their efficiency. It is therefore advisable that work in designing labor-saving farm tools for weeding, earthing up, ridging, and planting may be started immediately. While developing such designs, the existing patterns of farmers' work habits, simplicity in design, so that the tool can be manufactured at the village level, and cost of production may be kept in view. Training of

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the local blacksmith in the manufacture and repair of new tools should be coupled with any extension program on the introduction of newly designed tools.

Manures and Fertilizers

The importance of manures is very well recognized by the farmers in Makarfi district. Among the organic manures in use are farmyard manure and manure from the dung of fulani cattle. Superphosphate and ammonium sulphate are among the chemical fertilizers in use in this area.

Ninety-eight per cent of the farmers in this study conserve their farmyard manure in order to fertilize their fields. One per cent of the farmers buy this manure from others.

Sixteen of the one hundred farmers in this study had used manure from the fulani cattle. Ten of these sixteen farmers were cattle fulanis themselves. The remaining six farmers (two of them were Pagans) had kraalled fulani cattle on their land. Five of these six farmers had paid money to Fulanis varying from eighteen shillings to thirty-six shillings. The sixth farmer did not pay anything.

A detailed description of the use of superphospate has been given in the next chapter. Ammonium sulphate is a new introduction in this area. Only four farmers in this study used ammonium sulphate in the year 1961. Villagers who are also traders have begun to try ammonium sulphate. Fertilizer from the Nigerian Tobacco Company is also referred to as ammonium sulphate. It is used on tobacco and sugarcane.

Fungicides and Insecticides

Very limited use of insecticides is being made by the farmers

for plant protection purposes. D. D. T. powder is usually available in the rural markets. The quantities purchased are very small. It is sold by petty traders either in packets or bulk. Sometimes spoons are used as measures. Twenty-one farmers in this study reported having bought D. D. T. powder last year. Nineteen of them used it "to kill bed bugs and/or termites and insects" either on body, clothes, or in the household. Two of the farmers reported having used D. D. T. in granaries for grain storage and one had also dusted tobacco seedlings in addition to using it for "killing bed bugs."

Five of these one hundred respondents had used Fernasan "D" or Aldrex "T" for seed dressing. All of them had bought seed dressing in the local markets and used it to treat guinea-corn seed. The quantity of seed dressing used varied from one packet to ten packets per farmer. The responsibility for securing insecticides almost in all cases is that of the head of the household.

Implications for Educational Work

It has been seen that farmers who have tried insecticides or fungicides appreciate their effectiveness. Those farmers who do not know about the existence of modern plant protectors realize the need to use something in order to protect crops from pests and diseases. For example, two of the farmers reported that they use a parasite plant called Kauchin Kadanya (Loranthus Spp.) to save their millet and guinea-corn from smut. The leaves of this plant are pounded in a morter. Guinea-corn or millet seeds are treated with the pounded leaves before planting. The juice from the pounded leaves coats the seeds and it is supposed to save the crop from smut. Treating the seed with water

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in which potash has been dissolved and using water in which locust bean pods have been soaked overnight are some of the other treatments that some farmers give to save guinea corn and millet from smut.

Under such circumstances, where farmers already realize the need, educational work should bring increased results in the adoption of insecticides and fungicides. The Hausa word "Magani"[9] has been associated with insecticides and fungicides, and farmers often feel quite confident about the effectiveness of "Magani." This word can be used with advantage to extend the use of insecticides and fungicides. There is a great need for demonstrating the use of new pesticides and fungicides as well as spraying and dusting equipment in the area. Educational work in this respect will bring good results.

It has been seen that the distribution of fertilizers and insecticides, etc. is already being handled by the local traders at the village level. It is fortunate that the villages of the Makarfi district have farmers who cultivate land as well as do trading. Being more progressive in outlook and in a better financial position, they are usually able to try out new ideas. They would also be willing to stock farm supplies in order to sell to other farmers if they can get a profit.

In view of the shortage of extension staff and the increasing demand for farm supplies, it would be advisable to turn the distribution of farm supplies over to rural traders. Each extension worker should find these people in his area and encourage them to stock farm supplies. The extension workers should keep in contact with the traders and keep them informed about their availability. It has also been seen that many customers learn the methods of use from these traders; therefore, it

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[9]Magani is a Hausa word. It means medicine.

will be worthwhile if the extension agents keep them up-to-date on new methods.

Use of Credit for Farm Supplies

It was not within the scope of this study to conduct a detailed inquiry on indebtedness in rural areas. However, it was considered pertinent to ask questions about the present extent of borrowing by the farmers in order to secure essential supplies such as seeds, fertilizers, implements, etc.. This was considered necessary because it has implications for a program of supplies to support the educational activities in agricultural development.

TABLE 21

AMOUNT BORROWED FOR AGRICULTURAL SUPPLIES

Purpose of credit	Total families	Amount Borrowed in Shillings					
		5 & under	6-10	11-15	16-20	26-30	55-100
		Number of families					
Did not borrow money	76						
Borrowed money for farm supplies	24	3	6	8	3	2	2
Seed alone	14	3	3	7	1	-	-
Manures alone	3	-	1	-	1	1	-
Implements alone	2	-	2	-	-	-	-
Seeds & Implements	3	-	-	1	-	-	2
Seeds & Manures	1	-	-	-	-	1	-
Seeds, Implements & Manures	1	-	-	-	1	-	-

Interest Charged

Because of the taboo on charging interest in a Muslim society, it would be difficult to find the exact rate of interest. Farmers were asked questions about "how much they have borrowed" and "how much

TABLE 22

LENGTH OF TIME FOR WHICH CREDIT FOR FARM SUPPLIES IS TAKEN

Purpose of credit	Percentage of families who took credit	Length of time for which money borrowed: For 3 months	For 4-7 months	For a year	For 18 months
		Percentage of families			
Seeds	19	3	13	2	1
Manures	5	-	3	2	-
Implements	6	-	4	1	1
Total	30	3	20	5	2

TABLE 23

AMOUNT BORROWED AND SOURCES OF CREDIT

Amount borrowed	Total families	Sources of Credit: Friend	Liman	Wife or Aunt	Brother or Relative	A Farmer	N.T.C
		Number of Families					
Did not take any credit	76						
Borrowed money	24	3	1	2	5	11	2
Under 5 shillings	3	-	-	-	-	3	-
6-10 shillings	6	2	-	-	3	1	-
11-15 shillings	8	-	1	1	-	6	-
16-20 shillings	3	-	-	-	1	1	1
25-30 shillings	2	-	-	1	-	-	1
55-100 shillings	2	1	-	-	1	-	-

are they supposed to pay back." Out of twenty-four farmers who had borrowed money, twenty-two farmers said that they have paid or are supposed to pay back as much as they had borrowed. These answers, however, cannot be taken at face value. Many farmers consider it wrong to mention that they are paying interest. It would also seem that in

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some cases of borrowing, no interest is charged. This depends upon the source of credit. Borrowings from relatives and close friends are usually free of interest. In other cases where no interest is charged, the borrower may be in a position of clientage or may have some non-monetary obligations towards the creditor.

In cases where a loan is taken from local money lenders or "other farmers" it would be right to assume that interest is charged. In the case of two farmers who indicated that they are supposed to pay back more than they borrowed, one had borrowed fifteen shillings at sowing time and paid back thirty shillings at harvest (six months). In the other case, the amount borrowed was five pounds and the borrower was supposed to pay back six pounds and five shillings after six months. The real rate of interest per annum would depend upon whether money can be re-loaned during the same year.

Implication for a Credit Program

The data presented indicate the present extent of borrowing for the purposes of securing agricultural supplies. With the existing level of agricultural requisites, the loan requirements of most of the farmers for this purpose are within thirty shillings. Most of the borrowing for agricultural supplies are of short term for about seven months, with a few cases of borrowing for a year. Among the prominent sources of credit are informal channels such as friends and relatives. A large number of borrowers indicated that the money was borrowed from "a farmer." This source can be a professional money lender or an interest-charging source.

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With the existing level of agricultural requisites, most of which are procured from within the village, about twenty-four per cent of the

farmers in this study had borrowed money. As new materials and equipment are introduced in farming, it can be expected that farmers will begin to depend more on supplies which come from outside the villages. This will involve spending more cash by the farmers; hence, the need for more credit. Both the number of potential borrowers and the amount required for borrowing per farmer will rise. We have already seen that, in case of cash crops, more farmers have to buy their seeds with cash. This process will be accelerated and multiplied as more new agricultural inputs and equipment are introduced. Therefore, any future programs of credit to support agricultural supplies must keep in mind the future needs of the farmers at an increased level depending upon the type of new introductions. The time of the year when credit will be required for a particular item is another crucial factor which must be kept in mind while planning credit programs.

It would also seem logical that the supply of credit for agricultural requisites is integrated or coordinated with extension work, so that the credit is used for productive purposes and farmers can make a profitable use of it. Otherwise, merely advancing credit without teaching its productive uses will prove another way of increasing rural indebtedness. Supplying agricultural requisites in the form of loan rather than handing out the cash money is another alternative. However, in all cases of loan, educational work should be done and the purpose of advancing the loan especially should be made clear to the farmer so that he takes it seriously rather than thinking of it as a free gift.

A major implication of the discussion above is in administration at the regional level. At the present time, there is no coordination between extension service of the Ministry of Agriculture and the Ministry

of Cooperatives. It is, therefore, suggested that coordination between the extension service and the Ministry of Cooperatives will bring greater results in terms of agricultural production and rural welfare.

Livestock Rearing

The rural economy of Makarfi district is of mixed farming type. In addition to the cultivation of land, farmers in this area raise a variety of livestock for supplementing their incomes. The major types of livestock maintained by the farmers of Makarfi district are cattle, sheep, goats, donkeys, horses, chickens, ducks, guinea fowl and pigeons. A detailed account of the types of livestock maintained by different types of families is given in Table 24.

TABLE 24

TYPES OF LIVESTOCK MAINTAINED BY 100 FARM FAMILIES

Types of Livestock Maintained	Total families	Settled Muslim "Hausa"	Pagans	Cattle Fulanis
	Percentage of families			
No livestock maintained	5	6	-	-
One type livestock	20	25	-	-
Two types livestock	42	45	60	-
Three types livestock	30	23	30	90
Four types livestock	3	1	10	10
Total percentage	100	100	100	100
Total families	100	80	10	10

Cattle are mainly maintained by nomadic or semi-settled Fulanis who graze the district every year. Fulanis live in symbiotic relation with the settled population, supplying them with milk and milk products, cattle for meat, hides and skins, and cattle manure through

kraaling. In exchange they receive money and the privileges to use grazing facilities in bush and farm lands.

In addition to Fulanis, three other farmers in this sample had kept cattle. These farmers fattened cattle for beef. The number of cattle fattened by them was under three in each case. A large number of Fulanis (7 out of 10) keep cattle "to increase their number and collect wealth." The others kept cattle for milk and manure. The first statement shows the attitude of Fulanis toward cattle. Many of them would like to keep big herds "in order to collect wealth," rather than for making money. Under prevalent circumstances, the improvement of cattle is difficult because the Fulanis refuse to decrease the size of their herd and cull undesirable stock. With big herds, feeding is a problem, especially during the dry season. Unless the prevalent attitude of the Fulanis is changed, where a majority of them would begin to think in terms of making money by keeping well-fed and selectively bred smaller herds, the solution of cattle improvement in Northern Nigeria seems difficult. It will involve creating a new set of values and changing the thought processes of these people. This will partly come from economic incentives and education and partly it is a matter of time and will change with the increase of general forces of social and economic change.

Goats and sheep are primarily raised for multiplication and later for sale in order to supplement family income. Kano brown, a medium-size goat, seems to do very well in the area. Goats are slaughtered throughout the year in the villages to supply the local population with meat. The breed of sheep found in this area are woolless. They are mainly raised for sale and ceremonial slaughter on religious

festivals. Sheep and goat milk is not used as a rule. During the whole study only one family of Kanuri origin was reported to use goat's milk.

The donkey is an animal of great economic use to the farmers. Donkeys are owned by many farmers and used for transport of produce to the markets. Farmyard manure is carried to the fields on donkeys. There is considerable lending and renting of donkeys among the farmers. The horse is a symbol of status. Only well-to-do farmers keep horses because they enhance the prestige of the owner. Traders have begun to use horses as draught animals for crushing of sugarcane.

No mules were found in use in the villages, although there are donkeys and horses. The mule, being a hybrid, is stronger than both of the parents. It can serve as a useful beast of burden as well as a draught animal in the country. The possibility of the use of mules as draught animals may be explored.

Chickens and guinea fowl are the two main kinds of poultry birds kept in this area. In addition to these, ducks, pigeons, and turkeys are also kept in small numbers. Guinea fowl was omitted at the time of designing the interview schedule by mistake. Therefore, data on them could not be collected. Poultry is kep by a large number of families in the district. The main purpose is to sell the eggs and birds. The eggs are sold for consumption by the Europeans or the southern people living in towns such as Zaria. The local people do not eat eggs on a large scale. An inspection of Table 24 (page 143, above) shows that the Pagans and Fulanis maintain a greater variety of livestock than the settle Muslim Hausa. The tables that follow give data about the ownership of livestock by family members, the number of families selling the respective livestock, and the role of family members in feeding, herding

and taking care of different kinds of livestock.

TABLE 25

OWNERSHIP OF LIVESTOCK BY FAMILY MEMBERS

Particulars	Do not maintain	Owned by				Average number per family	Number of families who sold last year
		Males	Females	Children	Males and Females		
Cattle	87	11	-	-	2	13	6
Goats	40	16	26	1	17	5	38
Sheep	59	25	13	1	2	3	14
Horses	92	8	-	-	-	1	-
Donkeys	64	36	-	-	-	1	-
Ducks	86	10	4	-	-	2	4
Chickens	21	22	25	4	28	7	47

Feeding and Housing of Livestock

The methods of feeding livestock are not based on any scientific findings. They have been followed through the generations and are the only methods the farmers know. During wet season, goats, sheep, and donkeys are kept inside the compound and fed with cut grass. In some cases and at times they are grazed along the field boundaries and empty patches. The grazing may be supervised by a family child or the animal is tethered with a peg in a grassy and weedy patch of ground. During the dry season they are let loose out in the fields to graze. The goats and sheep may also be fed or given guinea-corn husks in the family compound. Inquiries revealed that no grain is ever given to sheep, goats, and donkeys.

Fulani cattle mostly depend on grazing in the bush except in cases when a cow has newly calved. Then she receives some minerals and bran for a couple of days. At night Fulani cattle are kept in an open

pen thatched usually with bush fence.

TABLE 26

FEEDING, HERDING, AND HOUSING, AS WELL AS DECISION-MAKING FOR SALE OF LIVESTOCK

Particulars	Do not maintain	Fed, herded, and housed by				Decision for sale made by
		Male	Female	Children	Male & Female	
Cattle	87	13	-	-	-	males
Goats	40	-	-	-	60*	owners
Sheep	59	-	-	-	41*	owners
Horses	92	8	-	-	-	males
Donkeys	64	36	-	-	-	males
Ducks	86	2	12	-	-	males
Chickens	21	8	65	3	3	male and female

*In the case of goats and sheep, the outdoor work in connection with the feeding, herding, and watering is done by the male members of the families in case of Muslim Hausa, while the indoor work is taken care of by the women in a large number of families. In the case of Pagan families, however, the outdoor work may also be done by the females.

Settled people who keep cattle in order to fatten them take care of them very well. Such cattle are kept inside the compound and fed with grass, guinea-corn stalks, groundnuts haulms, family food waste, and other by-products, especially bran, from guinea-corn and millet.

No special effort is made to feed poultry birds. The birds usually wander around in compounds, huts, or in streets and pick on whatever they can find. Wastes from grain pounding and food from the family kitchen are other sources of food for the poultry.

It has been reported[10] that 29 per cent of the families had no separate housing for livestock and poultry. In 71 per cent of the families

[10]H. C. Abell, Home Economics Aspects of FAO Socio-economic Survey of Peasant Agriculture. Rome, Italy, Food & Agriculture Organization of the United Nations ETAP Report No. 1531, 1962, p. 22.

some housing was provided for poultry and other livestock. In families where there are no separate housing for livestock, they may rest outside or inside the living units. Chickens most often are housed either under the granaries or in the living huts or along with goats and sheep.

Implications for Livestock Extension Education

The discussion on family resources indicates the complex nature of farming in Makarfi district. Ninety-five per cent of the farmers cultivate land, rear livestock of various types in various combinations. Only 5 per cent of this sample cultivated land alone and did not rear any livestock.

Under the present circumstances, the extension work on livestock is with the Ministry of Animal Health and Forestry, and work on crops is within the Ministry of Agriculture. If this arrangement is to continue, some means of coordinating and reinforcing the work of each should be considered. Coordination both at the policy level and at the execution of field level is necessary so that both the ministeries can contribute effectively to increased production in rural family enterprises.

The present methods of rearing goats and sheep are age-old and learned, as in other cases, from generation to generation. There is a need to find better breeds and management practices which could be adopted by the local farmers in order to increase production. Goats seem to be extremely well suited to the ecology of the country and are a good medium to convert plant material otherwise not edible by human beings and cattle. Better management practices for stall feeling of goats will add to farmers' incomes. Soil conservationists' criticism can also be avoided if stall feeding is introduced. Since a few settled

farmers keep cattle, keeping of goats and sheep on scientific lines may be encouraged.

The contribution made by poultry towards food and cash incomes of the farm families in Makarfi district warrants the need for an educational program in order to improve the production of poultry at the family level. It is clear from the discussions and data above that most of the farmers rear poultry birds for economic reasons. A large number of families sell poultry in order to supplement their incomes. Promotion of improved poultry keeping methods, therefore, should become an integral part of the agricultural extension program. Dry season activities of extension workers should include educational work on poultry.

In a large number of families, women take care of the birds. Chickens invariably are kept inside the compounds. It will be difficult for men extension workers to visit the compounds where women are in seclusion. This indicates the need for including poultry extension work in home economics extension programs. Men extension workers can also continue working with families where wives are not secluded.

In view of the fact that the middleman's profit is too big, farmers are getting comparatively low prices from the sale of chickens. An organized marketing system for poultry birds and eggs is another need. Poultry extension should be accompanied by organized poultry marketing in order to ensure that farmers get the prices and the incentives needed to improve poultry.

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Non-Agricultural Professions

In addition to agriculture, the inhabitants of Makarfi district follow other pursuits to earn their living. There are a number of specialisms followed by men. They are butchers, tanners, leather workers, thatchers, builders, weavers, dyers, carpenters, blacksmiths, tailors, calabash carvers, drummers, pot makers, mat makers, praise singers, barbers, etc.. Among other professions followed are teaching of Arabic, working as employees of government, business, or Native Administration, trading, and working as middlemen, etc..

An effort was made to find what kinds and combinations of the subsidiary occupations farmers of this area follow. Of the 100 family heads in this study, 88 had additional activities by which the farmers earned additional money or food.[11] Many farmers pursued more than one additional activity.

In response to a question, "What other things do you do besides farming," a list of additional activities was given by the respondents. The activities are grouped below:

Activities relating to agriculture

1. farm labor
2. herding cattle
3. hunting
4. hiring out a donkey

Activities pertaining to crafts and skills

5. sewing with machine
6. sewing with hand
7. butchering
8. barbering
9. building

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[11] For the purpose of this analysis, cultivation of land was considered the basic activity and all other activities were considered subsidiary.

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10. bicycle repair
11. leather work
12. dyeing

Professions pertaining to trade

13. trading locally
14. trading away from the village
15. dillanci (middlemen)

Professions which bring status

16. assisting the village head or being a village head
17. government and/or Native Administration service
18. teaching Arabic
19. teaching adult education classes

Forty-three per cent of the farmers in this study pursued one additional activity, thirty-one per cent did two additional activities, nine per cent pursued three additional activities, and five per cent had four additional activities. The list given above is by no means a complete list of additional activities.

Many farmers follow a good number of additional activities. This is possible due to the fact that very little capital and technical skill is required to follow some of these activities at the present technological level. An important consideration is whether a farmer follows these activities through the dry season or the wet season or throughout the year. This seems to differ with the income-earning potential of an activity. If an activity earns a good income to the farmer, he pursues it in both the wet and dry seasons. In that case he might hire farm labor to do farm work for him. Such farmers usually have enough capital at hand. It has been seen that such farmers invest more money in their farm businesses chiefly in hiring more labor and buying manure.

A considerable number of farmers (15 per cent) reported doing farm labor as an additional activity in this study. Fourteen per cent of

the respondents did farm labor in the wet season as well. This means that they had to suspend their own farm work and go to somebody else's farm for earning money at a time of the year when they could profitably use their own labor on their own farms. This inevitably results in low farm production on their own farms. This way they fall into an unending cycle of poverty. These are the marginal farmers and most probably families like this need more financial and technical help if they have to stay in agriculture.

TABLE 27

TRIBAL GROUPS PURSUING SUBSIDIARY ACTIVITIES

Tribe	Total No. of respondents	Additional Activities				
		None	One	Two	Three	Four
		Percentage of families				
Settled Muslim "Hausa"	80	10	41	33	10	6
Pagan	10	40	50	10	-	-
Cattle Fulani	10	-	60	40	-	-

There are tribal differences in the number of additional activities being followed. A much larger percentage of Muslim settled Hausa follow one or more additional activities, whereas a comparatively larger proportion of Pagan farmers reported no additional activity.

All cattle Fulanis pursued additional activities related to farming and four of them supplemented them with activities pertaining to craft, trade, and high status. Three pagans did farm labor as an additional activity, one combined hunting and trade, and two did trading. On the whole, Pagans and Fulanis weighed heavily towards jobs related to farming. Among settled Hausa, comparatively more respondents

followed activities pertaining to trade and craft and high status, and relatively fewer proportions than cattle Fulanis and Pagans followed additional professions related to farming.

A detailed account of income-earning activities for women in addition to their normal duties of homemaking has been given in another report under this project.[12] Suffice it to say here that all farm women in Makarfi district pursue additional income-earning activities. The income so earned by women is spent by them in various ways, as shown in the report mentioned above.

Discussion

One thing is clear from these facts--the economy of Hausa communities is highly complex and diversified. An attempt to improve the lot of these rural families must keep in mind not only the improvement in knowledge, skills, and attitudes of rural people in cultivation of land, the the other economic activities which occupy a portion of rural people's time and add significantly to the family food and income. Improvement in techniques and levels of skills for cultivating land, raising of livestock, and working on subsidiary occupations in a coordinated manner will ensure economy and better utilization of both human and material resources and contribute towards better standards of rural living.

The complex and varied nature of production in the rural economy of Makarfi district is the effect of ecological conditions on the ways of mankind. Cultivation of land is limited to a certain period and to certain places during the course of the year. The people have responded

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[12] Abell, op. cit.

to this condition of lack of soil moisture by selecting other subsidiary occupations during the part of the year when working on the land is not possible. This is true in most parts of the world where agriculture is seasonal. Until the ecological conditions are changed (possibly with the increase of moisture through irrigation on farm lands), which will change the work cycle of farmers, the importance of these additional activities of Hausa people will continue as sources of family food and income. Therefore, for the present it is important that any program of improvement through change must consider or coordinate the improvement of rural people in these spheres along with farming. This may be possible in the form of a cottage industries program. The present problem in these subsidiary professions seems to be of organization and modernization. The units of production and the channels of trade and distribution do exist but need further organization and development.

Impact of the Nature of Economy on Farm Population

An important aspect of the complex of professions is the influence they exert on the attitudes of farmers towards other and new income-earning activities. Though many of the professions, especially crafts are still hereditary and son follows father, there is considerable mobility among these professions. At the present time in Makarfi district butchering, dyeing, begging, praise singing, drumming, and a few other activities are considered low prestige and only certain families in the village can follow them. Other activities can be adopted by the people without too much embarrassment. On the whole, most of the non-agricultural jobs are considered as another way of making a living. Compared to some other rural societies over the world, there is much

less prejudice against many of these activities in Makarfi district. This mobility and fluidity of professions softens up the general attitude of farmers towards diversification and adopting new ways of doing things and reduces the general resistance to new economic ideas.

Trading sometimes involves travel to other places outside the village. This exposure of rural people to the outside world and especially to urban situations has an influence of its own. Such a person gets used to meeting strangers and seeing new things alien to his own village. He sees other people using these utilities. This helps him to be more open-minded in his attitudes towards new things, new people, and new ideas. The amount of new things learned and the change of attitude will, of course, depend upon the individual and the situations he is exposed to. This has its impact in the field of agricultural change.

The third influence that these professions exert on the farm population is the creation of a sense of economic values on their activities. Buying and selling brings about an awareness about profit and incentives.

The fourth influence that these activities have is in the form of direct contribution of capital for farming. The money earned by cash crop sales in December to February is usually consumed by the time sowing season approaches. These additional activities provide capital during the sowing season for different farm operations.

CHAPTER VIII

CHANGES IN AGRICULTURAL PRACTICES AND THEIR FUTURE SCOPE

In order to formulate suitable educational approaches to bring about desired changes in agricultural patterns and practices, it is necessary that an evaluation and study of the changes which have already taken place be undertaken. Such information should furnish understanding of the processes of change and the diffusion of new ideas and practices relevant to this study. It should also indicate the relative effectiveness of different influences which cause changes in agricultural methods. In addition, such a study should demonstrate the differential effectiveness of different agencies and agents of change, different methods and means of education and the importance of social structure and other sociological data. Farmers' existing knowledge of improved agricultural practices, the present level of changes in agricultural techniques and practices, farmers' willingness and attitudes towards adopting agricultural innovations should also be studied. On the basis of understanding gained from such a study, educational strategies suitable to Nigerian rural areas can be worked out in order to introduce further changes. Such a study should also help in assessing the future scope of technical changes in agriculture in the area being studied.

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Influencers of Change

The influences which work towards introducing new and improved practices in agriculture in this area can be classified broadly in the following six categories:

1. Among the institutionalized agencies which deliberately try to introduce changes in the agricultural patterns and methods are such as the Field Services Division and the Division of Produce Inspection, both of the Ministry of Agriculture; Zaria Native Administration Agricultural Department; and Nigerian Tobacco Company (tobacco extension work only). The workers from these agencies work in this area in order to introduce definite changes according to their respective interests. The relationship and the responsibilities between the Ministry of Agriculture staff and the staff of the Native Administration agriculture department in carrying out extension work has been discussed in Chapter IV. The staff of the Produce Inspection Division of the Ministry of Agriculture is only interested in introducing changes in cotton growing. The comparative importance and effectiveness of these agents as teachers of new ways, methods and techniques in agriculture is given in the pages that follow. These agencies mostly serve as the "first step contact" in communicating information. Their contacts are limited in most part to the traditional power structure at the respective levels.

2. The traditional channels of communication and authority are the second type of influence prevalent in bringing about changes. This source of influence includes the traditional power structure stemming from the Emir of Zaria through the Councillor for Natural Resources to the District Head, to the village heads and, eventually, to the peasants. This source serves as a legitimizing source and is very effective in

communicating with the local people. However, the effectiveness of this source depends to a large extent on the power and capacity of institutionalized sources for manipulation of this source for use. On the other hand, the enlightened traditional leadership reinforces and activates the institutionalized sources for bringing about more changes. An example of this can be found in the Emirate of Katsina in Northern Nigeria, where the Emir is very much interested in agricultural development. He invites, initiates, and legitimizes the agricultural agencies and their programs with the result that the Emirate of Katsina is more advanced in agricultural improvements. The influence of this source is quite clear in the introduction of superphosphate in Makarfi district.

3. The third source of change is the influence exerted by mass media. The role of mass media in supplying information cannot be denied, especially in the initial stages of the diffusion process. However, its role in influencing the people as directly or simultaneously as has been imagined is somewhat disputed.[1] The mass media being used in this area includes radio and information material produced by the Ministry of Agriculture. Work done by the publicity unit of the North Regional Marketing Board and the Public Enlightenment Division of the Ministry of Information are two other sources. Some private companies also do sales promotion work in the roadside villages, mostly on insecticides and medicines. The use of films, posters, radio, and news letters, and agricultural shows have contributed to the changes in agriculture in this area within their limitations.

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[1]For further discussion on this subject, the reader is referred to Joseph T. Clapper, The Effects of Mass Communication. New York: Free Press, 1960, Part One.

4. The fourth source of influence for agricultural change in Makarfi district is the presence of commercial concerns such as the United Africa Company and the local traders. They procure and sell such agricultural supplies as insecticides, fertilizers, and agricultural equipment, including groundnut decorticators and cane crushers. This source has contributed to the introduction and changes which involved the use of new materials and farm equipment. To a large extent this source has supplemented the efforts of other sources of influences and has helped in the perpetuation of changes. In some cases they have even initiated the changes as will be seen throughout this chapter. An example of this is the introduction of groundnut decorticators in the area, initially brought from the neighboring Republic of Niger.

5. The most important source of influence for change in the field of agriculture is, however, "informal." This source serves as a "second step" in the flow of communication in the diffusion process. Such sources include influential farmers, relatives, friends, and neighbors. This source overlaps other sources. For example, a neighbor may also be a trader or an influential farmer or he may be one of the village power elite which serve as linkage between the world outside the community and within the community.

6. The sixth source of influence in introducing change in agricultural methods is the Samaru agricultural experimental station. The station is situated about 6 miles from the southern tip of this area. It has exercised a very limited amount of influence in an informal neighborly way. The farmers working in the experimental station may see something being done which they might try when they get home to their own farms. Though some evidence of influence was found during the

field work phase of this study, the total influence appears to be negligible and of little real significance.

In view of the difficulty involved in collecting reasonably reliable data on this subject, it is not possible to delineate the net influence of each one of these sources in affecting agricultural changes. Recall and memory of the farmers were the main sources of data on these questions. Consequently, the reliability of such data is highly doubtful. It would, however, be safe to conclude that the total changes in traditional ways of farming in this area are the net result of one or more of these influences of change. In the absence of similar data available from other areas of Northern Nigeria, it is difficult to compare the relative intensity of all of the influences of change and the comparative amount of changes in traditional ways of farming.

Effectiveness of Agricultural Extension Workers

From preliminary inquiries, it was found that the agents from four different institutionalized agencies have at one time or another worked in this area in an attempt to affect changes in agriculture. A detailed account of the activities of each one of them was ascertained by asking questions from one hundred farmers in this study.

Nigerian Tobacco Company Extension Worker

An agricultural assistant of the Nigerian Tobacco Company has been working in this area. His main job is to encourage the production of tobacco and arrange for its marketing. In this study, 37 per cent of the respondents reported that they have never seen him. Of the 63 who had seen him, 5 respondents had seen him in another village. An N. T. C.[2]

[2]Nigerian Tobacco Company.

worker had visited the farms of 8 of the respondents, and the remaining 50 farmers had seen him in their own villages.

Questions were asked from the farmers about learning different aspects of tobacco growing in different contact situations. Five respondents who saw N. T. C. Mallam[3] in another village reported having learned nothing. On the other hand, all 8 farmers who reported having been visited by the N. T. C. Mallam on their farms reported having learned one or more things about tobacco growing. Of the remaining 50 respondents who had seen him in their own village, 44 reported that they had not learned anything from him. The remaining six farmers had learned things about tobacco growing.

Of the 14 cases of farmer' contacts with N. T. C. Mallam in which farmers had learned something, in 12 cases two-way communication between the N. T. C. Mallam and the farmer had taken place. Among the things learned by these 14 farmers from N. T. C. Mallam were drying of tobacco (2 cases), fertilizer application (3 cases), planting tobacco seedlings or tobacco cultivation (8 cases), and tobacco grading (1 case).

Native Administration Agricultural Mallam

An agricultural assistant of the Zaria Native Administration agriculture department is posted in Makarfi district to do agricultural extension work. Fifty-four per cent of the respondents in this study reported that they had never seen him. Among the remaining 46 per

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[3]Mallam is an Arabic word. Literally it means an educated person, a learned man. The term is originally used to refer to Arabic scholars or teachers in Hausa society. In common usage it is also used to refer to other educated people. Government servants or other Muslim outsiders who appear to be educated are also referred to as Mallams. All extension workers are referred to as Mallams. For ease in communication this term was used in the interview schedule and as such is used here.

cent of the respondents who had seen the N. A. agricultural Mallam, 5 per cent had seen him in another village, 38 per cent had seen him in their own villages and only 3 per cent of the farmers reported that the N. A. agricultural Mallam had visited their farms.

Five per cent of the farmers who saw the Mallam outside their own villages said they did not learn anything new. Of the 38 respondents who saw the Mallam in their own village, only 13 respondents said that they learned something new. In all three cases where the N. A. agricultural Mallam had visited the farms, farmers said they learned something new.

Of the 16 cases where learning had taken place, two-way communication between the agricultural Mallam and the farmers had taken place in 13 cases. In the remaining 3 cases, farmers merely listened to what the N. A. agricultural Mallam said.

Among the things that the N. A. agricultural Mallam taught the farmers are: availability of fertilizer and ways to apply it (12 cases), use of insecticides (1 case), ways of planting cow peas (1 case), and how to plant groundnuts (1 case). In one case the farmer asked the N. A. Mallam's permission to make brown sugar.

Government Agricultural Mallam

Before an evaluation of the activities of the government agricultural mallams is made, it should be kept in mind that there is no government agricultural mallam permanently working in the area. Government agricultural workers visit the area from time to time for specialized jobs. Therefore, the contact of this category of workers is much lower, of a temporary nature, and at selected places.

Ninety-five per cent of the farmers reported that they have never seen a government agricultural mallam. Among the remaining 5 per cent who had seen the government agricultural mallam, four per cent reported having seen him in their own villages. This four per cent of the farmers reported learning from him about cotton cultivation and how to sell it. Most probably these farmers have had contact with the government cotton mallam. The remaining one farmer reported having talked to a government agricultural mallam and having learned about a new seed.

Government Cotton Mallam

Three representatives of the Produce Inspection Division of the Ministry of Agriculture are posted in three cotton markets of Kudan, Gimi, and Gubuci in this area. Their main duty is to inspect cotton in cotton markets. During the wet season they are supposed to do cotton extension work.

Forty-five per cent of the farmers in this sample reported that they have never seen a cotton mallam. It appears that these farmers either do not grow cotton or do not market their cotton themselves. Ten per cent of the farmers reported that they have seen the cottom mallam away from their own villages. Forty-six per cent of the respondents reported that they have seen cotton mallam in their own villages. The remaining four per cent of the farmers indicated that a cotton mallam has visited their farms.

Out of sixty per cent of the farmers who had seen the cotton mallam, forty-three per cent reported having learned nothing. The remaining seventeen per cent had learned things from the cotton mallam as follows: cotton grading (4 mentions), learned about the start of close

season (7 mentions), cotton cultivation (6 mentions).[4]

In sixteen cases of seventeen where the farmers had learned something from the cotton mallam, two-way communication between the farmer and the cotton mallam had taken place.

Table 28 compares and summarizes the extent and kind of contact of different extension workers with 100 farmers in this study. A comparison is also made of the situations in which definite learning regarding agriculture takes place.

Discussion and Implications

A study of Table 28 and the discussions on the preceding pages show that a large number of contacts of the farmers with the extension workers are within their own villages. The contacts outside of their own villages are much less. Similarly, the number of cases where the extension workers have visited farmers' farms is less. The Nigerian Tobacco Company workers have the highest number of contacts; the next in total number of contacts is the government cotton worker. In reality, the number of contacts per cotton worker should be much less than the figure shown here, because there are three cotton mallams working in this area whereas the number of other kinds of workers is only one each. The contacts of the tobacco extension workers through farm visits is also the highest.

The number of farmers who have learned things about agriculture from different kinds of extension workers is also given in Table 28. If one refers to the pages on which the discussion of each type of worker

[4]Under the Northern Nigerian law, cotton growers must clear their fields of cotton stalks and burn them after harvest. The time of the year when the law is in force is called the close season.

TABLE 28

SUMMARY OF THE TYPES OF CONTACTS OF 100 FARMERS WITH EXTENSION WORKERS AND LEARNING UNDER DIFFERENT CONTACT SITUATIONS

Particulars of the contact	N. T. C. mallam	N. A. agricul. mallam	govern- agricul. mallam	govern- cotton mallam
	Percentage of farmers			
The farmer had never seen or talked to	37	54	95	40
Had seen him only	48	32	4	36
(a) in another village	5	5	-	7
Has learned something	(nil)	(nil)	(nil)	(nil)
(b) in his own village	43	27	4	29
Has learned something	(2)	(3)	(4)	(1)
Had seen and talked to him	15	14	1	24
(a) in another village	-	-	-	3
Has learned something				(3)
(b) in his own village	7	11	1	17
Has learned something	(4)	(10)	(1)	(9)
(c) on his own farm	8	3	-	4
Has learned something	(8)	(3)		(4)
Total percentage	100	100	100	100
Total % of contacts with farmers outside their village	5	5	-	10
Total % of contacts with farmers in their village	50	38	5	46
Total % of contacts on the farms	8	3	-	4
Total % of farmers who learned things about farming	14	15	5	17

has been given, he finds that, in the case of the Native Administration agricultural Mallam, a large number of farmers (12 farmers) received information about the availability of fertilizer only. Similarly, the government cotton mallams were referred to by the farmers as sources of learning about cotton grading (4 cases) and close season of cotton (7 cases). These jobs are more of a regulatory nature than educational, because if a farmer brings bad cotton to the market it is liable to be rejected. Also, if he does not observe the close season of cotton, he can be fined. In the case of these workers, the teaching of specific items regarding farming has not taken place in an appreciable number of cases. On the other hand, in the case of the Nigerian Tobacco Company worker, the farmers reported having learned specific things. In the case of the government agricultural mallam, the total number of contacts were very small, but farmers reported that in all cases they had learned something new from the government extension workers.

Regarding learning of things about agriculture from different kinds of extension workers in different contact situations, it can be seen that in the case of contact outside the farmer's own village, no learning has taken place except in three cases where farmers have learned from the cotton mallam. It is suspected that these three farmers must have been informed about grading of cotton by the cotton mallams while selling their cotton outside of their own villages. In the case of farmers' contacts with extension workers in their own villages, learning does take place; however, except in the case of contact with the government mallam, such learning does not extend over a large number of cases. On the other hand, in situations where the extension worker visits the farmer's farm, farmers have reported learning

something in almost all cases. In contact situations, learning seems to have a relationship with two-way communication. A large proportion of the farmers who reported talking to the extension worker also reported having learned something. Two-way communication takes place to a greater extent when the contact takes place in more familiar situations. For example, the chances for talking to the extension worker increase if the contact takes place in the farmer's own village. In the case where the extension worker comes to visit the farmer's farm, conversation invariably takes place.

One important implication of these findings in extension work is that personal contact, two-way communication, and farm and village visits, especially farm visits, are some of the very important methods of teaching new ideas and practices in this area. The other implication of these findings is the staff requirement that, in order to carry out extension work with this method, a large number of extension workers is required.

Differential Contact with Different Strata of Farmers

Table 29 (see following page) shows contacts with the different strata of farmers in this study and with different numbers of extension workers.

The farmers living in the main village have much better contact with the extension workers. A large number of farmers living in the hamlets have no contact with extension workers at all or, if they have contact, it is with the fewer number of extension workers. Among the different tribes living in the area, cattle Fulanis and Pagans have comparatively fewer contacts with extension workers. Political title

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TABLE 29

CONTACTS WITH 100 FARMERS BY EXTENSION WORKERS ACCORDING TO TRIBE, SOCIO-ECONOMIC STATUS AND LOCATION

Number of extension workers known	Total % in the sample	Farmers living away from main villages				Farmers living in main villages			
		Total	Pagan	Fulani	Others	Total	Traders	Political title holders	Others
		Percentage of farmers							
Has never seen and/or talked to any extension mallam	23	51	40	90	30	9	-	-	13
Has seen and/or talked to only one extension mallam	23	30	50	10	31	20	10	-	26
Has seen and/or talked to two extension mallams	16	6	10	-	8	21	30	20	19
Has seen and/or talked to three extension mallams	33	13	-	-	31	43	50	70	36
Has seen and/or talked to four extension mallams	5	-	-	-	-	7	10	10	6
Total percentage	100	100	100	100	100	100	100	100	100
Total number	100	33	10	10	13	67	10	10	47

holders and farmers who also do trading have had contacts with greater numbers of extension workers, as compared to other farmers.

Introduction of Improved Farm Practices

To assess the extent of introduction of improved farm practices, farmers were asked questions regarding what improved farm practices they were using and what were the sources of their learning about these farm practices. A list of farm practices recommended by the Ministry of Agriculture was prepared in consultation with the principal agricultural officer of Zaria, and individual farmers were asked to give information on each one of them.

Growing of Samaru Guinea-corn Seed

The farmers were asked if they grow guinea-corn released by Samaru Agricultural Station. None of the farmers in this study seemed to be aware of the fact that the guinea-corn they are growing is an improved variety released by the Samaru agricultural research station.

Information collected regarding the adoption of upright groundnuts and the practice of contour ridging done by the farmers was found incorrect at the time of analysis; therefore, both of these items are not discussed here.

Cross-tying of Ridges

Eighty-four per cent of the farmers in this study reported that they cross-tie their ridges. Seventy-six of this eighty-four reported that they learned this practice from their families or from their fathers. The remaining eight per cent of the farmers mentioned that they learned this practice from other farmers. The sources of learning about this

practice were mentioned as follows: from the village traditional leaders (1%), from another farmer, friend, relative, or neighbor (6%), adopted this practice when came to settle in this village (1%).

Use of Seed Dressing

Ninety-two of the one hundred farmers in this study reported that they have never used seed dressing. Three of the remaining eight farmers reported having used the native methods (described elsewhere) of seed dressing. The remaining five farmers had actually used fungicides. The sources of knowledge and learning about the use of fungicides were given as Native Administration agricultural mallam (2 cases), European Officer (1 case), United Africa Company (1 case), learned from another farmer (1 case).

Spraying of Cotton

None of the farmers in this study had ever tried or heard of cotton spraying as an improved practice. Spraying of cotton is a very important practice recommended by the Samaru Experimental Station.

Grading of Tobacco

Eight per cent of the farmers knew about grading of tobacco. The sources of learning about tobacco grading by these eight farmers were N. T. C. mallam (3 cases), village head (1 case), other village officials (2 cases), learned from a friend or relative (2 cases).

Dry Season Farming

This practice was included as an improved practice in this study. Though it would hardly be fair to compare the farmers, because everybody does not have a free choice to practice dry season farming. It

depends mainly on whether a farmer owns a piece of fadama land or not.

Forty-five per cent of the farmers reported practicing dry season farming. In forty-one per cent of the cases, the practice was inherited or learned from father or family. Only four per cent of the farmers had adopted this practice during their lifetime within a period varying from one to ten years. In each of the four cases of new adoption of this practice, the sources of learning or knowledge were given as village head (1%), another farmer, relative, or neighbor (3%). An additional nine per cent of the farmers owned fadama lands but did not practice dry season farming. This could be because of lack of water for irrigation.

Mixed Farming

In the Northern Nigerian context mixed farming means the ownership of cattle and their use as farm power. No farmer in this study had ever practiced mixed farming.

Use of Groundnut Decorticator

This was included as one of the improved practices in agricultural marketing. Farmers who use a groundnut decorticator and sell the kernel are progressive and more aware th an those who sell the whole groundnuts. Thirty-six per cent of the farmers reported having used groundnut decorticator. The sources of learning the use of groundnut decorticator were given as traditional sources, such as village head and other village respectables (10%), informal sources such as another farmer, friends, or relatives (21%), and village traders, which accounted for the remaining five per cent of the cases of learning the use of the decorticator. Most of the groundnut decorticators are owned either

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by village traders or rich people in the villages.

Summary of the Adoption of Improved Practices

Table 30 (see following page) gives a summary of the improved farm practices being followed by one hundred farmers in Makarfi district. Distribution by tribe, location of the farmers, and by socio-economic status is also given. The use of superphosphate is not included in this summary since details on its introduction and adoption has been given separately.

Farmers living in the main villages follow more improved practices as compared to the farmers living outside the main villages. Cattle Fulanis are low in following improved practices. A comparison of Pagans with other farmers is given in Table 30. The farmers who also do trading seem to follow more improved practices.

Present Level of Farmers' Knowledge About Improved Farm Practices

The farmers were asked to "count any good methods which increase farm yields." Forty per cent of them replied that they do not know any improved methods which increase crop yields. Thirty-one per cent of the respondents reported that manuring increases yields. Twenty-two per cent of the respondents said that manuring and good husbandry (good cultivation, including weeding) increase yields of crops. Three per cent of the farmers associated early planting, manuring, and weeding with increased yields. The remaining four per cent mentioned spacing, weeding, and early planting as improved practices.

From the responses given, it appears that the farmers' knowledge about yield-increasing farm practices is based on knowledge

TABLE 30

SUMMARY OF IMPROVED FARM PRACTICES FOLLOWED BY 100 FARMERS BY TRIBES, LOCATION, AND SOCIO-ECONOMIC STATUS

Number of improved practices followed	Total % of farmers	Farmers living outside main villages				Farmers living in main villages			
		Total	Pagan	Fulani	Others	Total	Political title holders	Traders	Others
No improved practices	9	15	20	20	8	6	10	-	6
One improved practice	35	51	50	70	38	27	40	30	24
Two improved practices	38	28	20	10	47	43	30	40	47
Three improved practices	15	3	10	-	0	21	20	10	23
Four improved practices	3	3	-	-	7	3	-	20	0
Total percentage	100	100	100	100	100	100	100	100	100
Total number in each group	100	33	10	10	13	67	10	10	47

passed down from father to son. None of the farmers mentioned the use of insecticides and better seeds. Very few farmers mentioned spacing and early planting. In these cases the proper spacing and approximate planting dates were not known. In the case of farmers who mentioned manuring as a factor in increasing yields, the exact doses, time, and method of applications may not be known. This indicates the scope for an educational program and the range of activities that can be undertaken in order to demonstrate the usefulness of many new ideas, practices, techniques, and tools which may contribute to increased farm productivity.

Farmers' Efforts to Learn New Methods

In an attempt to learn whether the farmers ever try to learn new methods, the question was asked, "have you ever tried to learn a new method which raises more crops?" Seventy-two per cent of the respondents reported that they have never tried to learn anything new. Twenty-three per cent replied that they have tried to learn the use of fertilizers from different sources, of which the village head was mentioned by seven per cent, Native Administration agricultural mallam by six per cent, another farmer by two per cent, N. T. C. mallam by four per cent, and United Africa Company agent by four per cent of the farmers. The remaining reported that they have tried to learn about planting of cotton (3%), planting of upright groundnuts (1%), and manuring (1%).

The information indicates that substantial percentage of farmers try to learn something new when they come in contact with different influencers of change. Taking into account the present intensity of contact of influencers of change with the farmers and the level of education

and general awareness, the responses of farmers measured in terms of their own effort to learn something new seems high.

Urge for Material Possessions and the Need Among Farmers for Monetary Expenditure

The urge for earning cash is usually associated with the urge and need for spending and/or owning money. In Makarfi district, a great deal of emphasis is placed on becoming "Mai Arziki" which, among other things, involves consumption through the ownership, use, and display of material possessions. Another very important motive for earning money in this area is to spend for religious purposes and thus gain religious merit and social prestige. In addition, there is the normal pressure for use of consumer goods and items of living. These urges and needs exist among the farmers of Makarfi district. They exert considerable pressure and motivate individuals for increased and varied economic activities.

In order to assess the kind of things farmers aspire to, questions were asked about preferences of the heads of households for spending money. Twenty-nine per cent of the heads reported that if they have money they would like to buy items pertaining to family, e. g., education of the children, clothing, food, better house, etc.. Forty per cent of the respondents indicated that they would like to spend their money on items pertaining to farming, e. g., buying of more land, seed, fertilizer, and hiring of labor. Another thirty-one per cent of the farmers reported that if they had money, they would like to spend it on personal items such as marrying another wife, pilgrimage to Mecca and other items of a personal nature.

They were also asked why they would like to spend money on these items. The relationship between the desire to spend for particular items and reasons for spending money on such items is shown in Table 31.

TABLE 31

PURPOSE FOR SPENDING MONEY AS RELATED TO REASONS AMONG 100 FAMILY HEADS IN MAKARFI DISTRICT, 1961

Purpose for which Maigida wants to spend	Reasons for spending: Immediate pressing needs	For maximizing existing facilities	To bring future benefits	Relig. reasons	Total
	Number of farmers				
Family items	24	1	2	2	29
Farming items	20	20	-	-	40
Personal items	1	0	6	24	31
Total	45	21	8	26	100

Table 31 shows that forty-five per cent of the heads of the households would like to spend their money on pressing immediate needs. Twenty-one per cent want to extend existing facilities. Out of this twenty-one per cent, twenty per cent would like to spend on farming items. These twenty per cent of the respondents are probably more enterprising farmers than others and a program of education combined with credit with such farmers should prove useful. The farmers whose reasons for spending money pertain to future benefits or religious reasons will spend their additional money for consumption purposes. On the other hand, farmers who reported that they would like to spend on family items because of the pressing needs are most probably the poorest.

Satisfaction and Dissatisfaction of Farmers with the Present Status of Agricultural Production and Their Willingness to Learn New and Improved Agricultural Practices

A person's satisfaction or dissatisfaction with the present conditions can be related to his desire for maintaining the status quo or change for the better. It appears that a person who is dissatisfied with his present lot will be willing to change much faster, provided the new change provides better conditions and the process of change does not involve any serious changes in his value system or a serious conflict with the society. Ordinarily, better agricultural practices offer more production and generally they do not involve elements of serious conflict.

An attempt was made to determine how far the farmers of this area are satisfied or dissatisfied with their present production levels. In response to a question, "did you produce enough food crops for your family last crop season?" seventy-two per cent of the farmers indicated that they did not grow enough food crops for their family last year. The remaining twenty-eight per cent said that they had raised enough food crops. In the case of cash crops, eighty-one per cent of the respondents said that they did not raise enough cash crops last year. Reasons for not being able to raise enough cash and food crops were mentioned as lack of labor, lack of land, lack of moisture, lack of soil fertility, and low yields. The other reason given by some families was that they have bigger families and the present level of production is not sufficient in view of the increased need for expenditure of food and cash on ceremonials. The year for which this question was asked (1961) was a year of exceptionally low rainfall. Rainfall being the main source of moisture on the upland farms which are the major source of food and cash, the total level of production would be much lower as compared to

the years of normal rainfall. Therefore, one would normally expect a lower than average level of satisfaction among the farmers in a year like this.

TABLE 32

DISSATISFACTION OF FARMERS WITH FOOD AND CASH CROP PRODUCTION DURING THE CROP YEAR, 1961

	Percentage of Farmers Dissatisfied					
Dissatisfied with	Total in sample	Fulanis	Pagans	Traders	Political title holders	Others
Food crops production	72	50	50	60	80	80
Cash crops production	81	70	80	70	90	87

When asked if "they would like to learn how to grow more food and cash crops by learning improved farming methods," 98 per cent of the farmers indicated that they would like to raise more crops by learning improved farming methods. Of the two farmers who did not want to learn any new agricultural methods, one is a cattle Fulani who does not want to be a cultivator of land any more. The second farmer places more value on trading and wants to concentrate his efforts on trading.

CHAPTER IX

ADOPTION OF SUPERPHOSPHATE FERTILIZER IN MAKARFI DISTRICT

Increasing agricultural productivity is the primary and immediate concern of the extension services. In underdeveloped countries the means of production employed by the farmers are traditional. The methods of production are non-scientific; the crop and livestock yields are very low. The processes of agricultural work in extension involve the replacement of traditional non-scientific farm methods by scientific methods of agriculture which bring about increased agricultural production. Introduction of new farm techniques is a process of technological change which is highly influenced by local social and cultural determinants. On the other hand, democratic systems of government require that these changes be brought about through educational processes. Agricultural development is required quickly. Because of these factors, it is necessary that the natural processes of diffusion of information, new ideas, and material in underdeveloped countries be studied.

A great deal of research work on how people accept new ideas and practices in agriculture has been done in the United States of America. However, little is known about the processes of diffusion and adoption of improved practices in underdeveloped countries, especially in Africa. Because of the differences in the socio-cultural systems,

generalizations from the American studies may not hold good in underdeveloped countries. It is desirable, therefore, that such studies in African countries are undertaken. From such considerations, the need for collecting facts on the subject of diffusion of an agricultural practice arose in this study.

The practice selected for this study was the "use of superphosphate fertilizer" by the farmers. Review of some of the data presented in the previous chapter will indicate that there are a few other agricultural practices adopted by the farmers which can be called "improved agricultural practices." A close examination of these practices offered several difficulties for a study. The use of superphosphate was a practice which offered some advantages for study. This is entirely new practice which has been introduced from outside within the last twelve years. It involves the use of a new material which can be identified and distinguished by the farmers. It was also assumed that, due to its newness, farmers will be able to give reliable data from memory. This is the only new practice introduced in the area with a level of success that makes a study of 100 farmers worthwhile. These are some of the reasons for selecting the use of superphosphate for this study.

History of Fertilizer[1] Use

Some factors have played an important part in the spread of superphosphate fertilizer in this area. A brief description of these factors in historical perspective must be kept in mind as background while studying the diffusion of its use.

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[1]For the purposes of this study the term fertilizer refers to single superphosphate with 16% P_2O_5.

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According to available information, the work on fertilizer extension was started on a substantial scale by the government of Northern Nigeria in 1948-49. The fertilizer was given by the North Regional Production Development Board. Later the work of fertilizer extension and popularization was taken over by the Department of Agriculture. Through campaigns organized by a Production Officer in charge of fertilizer, propaganda and information work was done with concentration in some parts of Northern Nigeria. Parts of Southern Katsina province and Northern Zaria were included in the campaign area. From the records it could not be ascertained whether Makarfi district was included in the campaign.

In the beginning years, superphosphate was distributed free to farmers through the Native Administration channels. In this area the fertilizer was distributed through the District Head of Makarfi, who further distributed it to the farmers through the respective village heads. In this process, only a few selected villagers could get free fertilizer. Within the villages the distribution was done by the village heads. There were no defined criteria for the distribution of superphosphate. Therefore, the village heads gave it free to those farmers they liked. The opportunity to receive fertilizer in the earlier stages must have depended on how close the farmer was to the village head. Therefore, the use of fertilizer in the earlier stages may not necessarily be related to a farmer's progressiveness. The data also indicate that the first use in some cases has not led to further adoption. It merely indicates that the farmers were in a position to receive fertilizer. However, the opportunity to be familiar with the fertilizer or the opportunity to secure it in the earlier stages paved the way for earlier adoption in some villages for

some farmers.

In or about 1953 and 1954 free issues of fertilizer on a large scale were stopped and farmers were asked to buy the fertilizer. The price of fertilizer at this time was high. During this time the rate of adoption of fertilizer remained low. Even during these years, a few villages were able to get small quantities of fertilizer free of cost. In 1960 the Government of Northern Nigeria began to subsidize the distribution of fertilizer.[2] With the start of subsidy scheme, the sale and use of superphosphate again increased. It is expected that in the future, if the subsidy continues and the fertilizer is available at the right time and right places, the sale and use of superphosphate will continue to increase.

At the present time fertilizer distribution is controlled by the Ministry of Agriculture. Supplies at present are not sufficient. It is possible that, in a certain village, farmers may be convinced of its usefulness and may use it in a given year because the fertilizer was made available by the Ministry. In the next year they may not use it because the fertilizer has not been made available in that village because the local fertilizer agent has not paid dues from the last year. This arrangement makes the study of diffusion of superphosphate very hypothetical and unreal. Such a thing should not be considered as reversion from the use of fertilizer, because the farmers might have bought the fertilizer had the fertilizer been supplied in the village. Availability of fertilizer within a reasonable distance from the user at the time of application is an important factor in the continued use and spread of fertilizers. If

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[2]A bag of superphosphate weighing 40 pounds was originally sold for 12 shillings. After subsidy the price was lowered to 5 shillings.

it is available nearby, it is probable that more farmers will use it for trial or regular use. The location of villages is an important factor in the availability of fertilizer because of the transportation problems. The presence of influential traders who would buy and take the fertilizer to the village is also an important consideration.

Another important factor which should be kept in mind in the study of fertilizer adoption in this area is contact of villages with the sources of popularization of fertilizers, e. g., institutionalized sources of influence. Most of the extension organizations and extension workers have their pet villages and pet farmers who cooperate with the agents and agencies much better than others. The extension workers spend more time with such farmers and villages in order to educate them about agricultural practices. In Makarfi area, there are some villages which are in much better contact than others with the agents and agencies concerned with fertilizer distribution and popularization.

Stages of Diffusion of Superphosphate

> The process of diffusion is defined as the (1) acceptance (2) over time (3) of some specific item--an idea or practice (4) by individuals, groups, or other adopting units, linked to (5) specific channels of communication, (6) to a social structure and (7) to a given system of values or culture.[3]

Studies of the diffusion process related to agricultural innovations in the United States have shown that there are definite stages in the process of diffusion of agricultural innovations. The generally accepted stages in a diffusion process are awareness, interest, trial and

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[3]Elihu Katz, Martin Levin, and Herbert Hamilton, "Traditions of Research on the Diffusion of Innovations," American Sociological Review, Vol. 28, No. 2, April 1963, p. 237.

adoption stages. At the time of designing the interview schedule, this model was kept in mind and the questions were designed in order to elicit responses according to this model. Simple questions were asked in order to establish whether there are the same stages of diffusion process in Nigeria as in the United States. Questions were asked to find out when a farmer first heard about the superphosphate, when he first saw it, when he first received it, and when he first used it. Since the farmers were not free to choose of their own accord and the distribution of fertilizer was controlled, these stages may not be equivalent to the stages of adoption had superphosphate been freely available. Table 33 summarizes the responses of the farmers about their first hearing, first seeing, first receiving, and first using the fertilizer. The time span mentioned is in years. It is approximate, because the main source of these data is "recall." No records were available about these 100 farmers from which the data could be checked or inferred.

Table 33 shows the stages in time when a large number of farmers first heard, first saw, first received, and first used the fertilizer. The total number of farmers who have and who have not heard about, seen, received, and used superphosphate is also given. The percentage of farmers who have heard about and seen the fertilizer is much higher than the percentage of farmers who have received or got and used superphosphate. These facts and the data presented in the following pages indicate that these one hundred farmers are at different stages in the diffusion process. A detailed inspection of the procedure followed by last year's superphosphate users also confirms the fact that these farmers have passed through all of the stages involved in a diffusion process. No attempt will be made to analyze the different stages of diffusion for

various reasons, but similar procedure will be followed of dividing the process into four stages of hearing, seeing, getting or receiving,and using the fertilizer for the first time.

TABLE 33

RESPONSES OF 100 FARMERS ABOUT FIRST HEARING, FIRST SEEING, FIRST RECEIVING, AND FIRST USING SUPERPHOSPHATE IN MAKARFI DISTRICT

Number of years	First heard	First saw	First received or got	First used
	Percentage of farmers			
Twelve years ago	6	3	3	3
Eleven years ago	1	1	0	0
Ten years ago	25	11	5	3
Nine years ago	1	1	0	0
Eight years ago	2	4	1	1
Seven years ago	19	6	3	3
Six years ago	3	4	2	3
Five years ago	15	16	5	4
Four years ago	11	9	1	0
Three years ago	5	7	4	5
Two years ago	4	7	3	3
Last year (1961)	5	12	12	12
Total so far	98	81	39	37
Total not, so far	2	19	61	63
Total	100	100	100	100

Hearing About Superphosphate

Hearing was the first stage in the process of adoption of the use of superphosphate in this area. A large number of farmers heard about superphosphate four to ten years ago. This approximately coincides with the extensive propaganda and campaigning done by the Ministry of Agriculture. Eighty-one per cent of the farmers first heard about superphosphate from one source. The sources of information about

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fertilizer at this stage were the traditional leadership sources in thirty-three per cent of the cases. Out of these, village head was referred to by 29 per cent of the respondents. The remaining sources were the district head, the Emir, and the village head's assistant. Informal sources alone were cited as sources of information in twenty-one per cent of the cases. These sources included a friend, a relative, a townsman, a farmer, and a neighbor. Trade sources alone were referred to as sources of information at this stage by only three per cent of the farmers. They included an agent of the United Africa Company, and local market sources. Mass media as sources of information were referred to by two per cent of the farmers. Films were the only source of mass media mentioned by the farmers. Institutionalized sources of influence were mentioned by twenty-two per cent of the farmers. These sources include Native Administration Agricultural Mallam, Wakilin Gona, Cotton Mallam and Nigerian Tobacco Company Mallam.

Thirteen per cent of the farmers reported first hearing about superphosphate from two different sources of information. They include traditional leadership (1%), traditional and informal sources (7%), traditional and institutionalized sources (2%), and informal sources and mass media (1%).

One farmer reported that he first heard about superphosphate from three different sources composed of mass media and informal sources. Another three per cent of the farmers first heard about fertilizer from four different sources composed of traditional sources, mass media and institutionalized sources. The remaining two per cent of the farmers have never heard about superphosphate.

Things Heard About Superphosphate

At the awareness stage, the type of information a person gets about a new idea should shape his views and future attitude toward it. The information which most of the farmers got with the fertilizer for the first time was, on the whole, of a positive nature. About two-thirds of the farmers heard that it is a useful new manure which increases crop yields. Others heard of it as being a modern, European manure associated with increased yields. Others heard of it as being "powerful" in comparison to local and Fulani manure. A small proportion of farmers heard that this manure protects the seed from diseases and that it is a possible weed killer.

Reaction of Farmers on Hearing About Superphosphate

Seventy-two per cent of the farmers reported that they did nothing when they first heard about it. Eleven per cent said that they tried to get some of it. Six per cent of them reported that they went ahead and bought it. Five per cent of the farmers wanted to see it first. Three per cent talked about it to other farmers. One farmer said he was afraid of it.

Seeing Superphosphate for the First Time

Table 33 (page 185, above) shows that about sixty-five per cent of the farmers who have seen superphosphate saw it within the last five years, i.e., approximately between 1957 and 1961. Nineteen per cent of the heads of the households in this study still have not seen superphosphate. Among eighty-one per cent who have seen superphosphate, sixteen per cent were shown it by the institutionalized sources. Farmers saw superphosphate with traditional leadership sources in the case

of thirty per cent. The respondents were shown fertilizer by informal contacts in thirty-three per cent of the cases. Two per cent of the farmers saw superphosphate for the first time in the market or with traders.

When asked about the places where the respondent first saw the fertilizer, fifty-three per cent of the farmers replied that they have seen it in their own village. Twenty-seven per cent reported having seen superphosphate for the first time in another village. The remaining one farmer saw superphosphate on someone's farm for the first time.

Reactions of the Farmers on Seeing Superphosphate

The farmers were asked, "What did you think of superphosphate when you saw it first?" Twenty-one per cent could not give any answer. Eleven per cent doubted its usefulness on first sight, because it did not look like manure. Twenty-two per cent compared it with the things they had already seen, e. g., potash, ground stone, wood ash, burnt bricks, or lime for white wash, etc.. Seventeen per cent of the farmers reported that they thought it could be useful. Nine per cent wanted to try it. One farmer reported having thought that it would spoil the flavor of grains.

Getting or Receiving Superphosphate for the First Time

Table 33 shows that about thirty-nine per cent of the family heads in this study had at least once received or procured superphosphate. Twenty per cent of them got the fertilizer in their own villages, while nineteen per cent of the farmers got it from another village.

Of the thirty-nine per cent of farmers who have got the fertilizer, eighteen per cent bought it and sixteen per cent got it free for the first time. The remaining five per cent reported having received it on loan (most probably from the Nigerian Tobacco Company). Questions were

asked on the utilization of the fertilizer when the farmers got it for the first time. Thirty-four per cent reported having used it on crops. One farmer threw it out in the bush. One farmer tried to white wash the walls of his house with it. Two farmers just kept it in their house for later use. One farmer gave it to his neighbors. The farmers who did not use their fertilizer on the crops immediately on receipt were those who got it free.

The First Use of Superphosphate

In most of the adoption studies, acceptance is the dependent variable. In order to find acceptance the use or adoption of a form of a given item and its internalization should be studied. Under the circumstances in which superphosphate has been taken up by the farmers in this area, the "first use" should not be taken as a measure of acceptance. In fact, the first use may only indicate the trial use. The data bear out this assumption. The discussion on the history of fertilizer distribution explains the reasons for the above finding.

Thirty-seven per cent of the farmers who had used fertilizer were asked to tell how they were convinced to use superphosphate. Five per cent of them said that they were convinced by the traditional sources of influence. Eighteen per cent reported that they were convinced about the use of superphosphate by relatives, neighbors, and friends and by seeing its use on other farmers' farms. Three per cent of the farmers indicated that they were convinced by institutionalized sources such as agricultural mallams. Six per cent could not remember any definite source, but they said they were convinced by general propaganda and by listening to other people. Four per cent of the farmers said they were

asked on the utilization of the fertilizer when the farmers got it for the first time. Thirty-four per cent reported having used it on crops. One farmer threw it out in the bush. One farmer tried to white wash the walls of his house with it. Two farmers just kept it in their house for later use. One farmer gave it to his neighbors. The farmers who did not use their fertilizer on the crops immediately on receipt were those who got it free.

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given the fertilizer free, so they used it and were convinced about its usefulness. This indicates the merit of free distribution of sample material in the initial stages. One farmer replied that "it is my policy to try new things."

Use of Fertilizer on Crops for the First Time

Out of thirty-seven per cent of the farmers who had used superphosphate, twenty-five per cent of the farmers reported having used it on cash crops for the first time. Four per cent of the farmers said that they used it on food crops. The remaining eight per cent of the farmers had tried it on both food and cash crops. The first hand experience of almost all the farmers with the use of fertilizer was good. They all reported that the effect on crops was very good.

Learning the Use of Superphosphate

Forty-five per cent of the respondents in this study reported that they learned how to use fertilizer from somebody else. Eight per cent of these farmers have still not used superphosphate. Among the methods by which such explanations were given are, the use of scoops, the use of fingers, and actual demonstration in the field. The persons or sources concerned with such teaching were the traditional sources (3%), the institutionalized sources (24%), the informal sources (12%), trade sources (3%), institutionalized and traditional sources (3%). The institutionalized sources rank much higher in the educational phase of the process. The next most important sources are the informal ones. In the responses to a question, "whether the farmer had seen superphosphate used on somebody else's farm before he used it himself," thirty-two of the thirty-seven farmers reported that they had seen it

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used on the land before they started using it. This indicates the importance of the "seeing is believing" principle in extension work in Northern Nigerian villages.

Summary of Influences at Different Stages in the Adoption Process

Table 34 gives information about the relative importance of different sources of influence at different stages of the adoption of the use of superphosphate. In the earlier stages of the process the traditional leadership sources, informal sources and the institutionalized sources of information played an important part. At this stage, the traditional sources were most prominent. The trade channels were also important, but not to a large extent. The mass media, unlike the situation in the United States, played a very small part, even in the earlier stages. This is because the level of development of mass media is very low and use of it is not made to the same extent as in the United States. However, with the increase in the use of mass media, it can be expected that it will begin to serve its information-giving function much more prominently as compared to the present level.

During the process of adoption when the farmers reported seeing the fertilizer, the institutionalized sources decreased in influence. Informal sources increased at this stage with a slight decrease in traditional leadership sources. More farmers saw fertilizer with their friends, relatives, and other farmers. During the process of decision-making about the use of fertilizer, the farmers reported that informal sources were the most powerful in convincing them to use superphosphate. The figure under "Other reasons and sources" in Table 34 also contains informal sources to a large extent. At this stage the influence of

TABLE 34

RELATIVE IMPORTANCE OF DIFFERENT SOURCES OF INFLUENCE AT DIFFERENT STAGES OF THE ADOPTION OF SUPERPHOSPHATE IN MAKARFI DISTRICT

Number and Name of the sources of influence or information	First heard about	First saw	First convinced to use	First learned to use from
	Percentage of farmers			
No information thus far	2	19	63	55
One source of influence or information:	81	81	37	42
Traditional leadership	33	30	5	3
Informal sources	21	33	18	12
Institutionalized sources	22	16	3	24
Mass media sources	2	-	-	-
Trade and market sources	3	2	3	3
Other reasons and sources	-	-	11	-
Two sources of influence or information:	13	0	0	3
Traditional sources	1	-	-	-
Traditional and informal	7	-	-	-
Traditional and institutionalized	2	-	-	3
Traditional and mass media	2	-	-	-
Informal and mass media	1	-	-	-
Three sources of influence or information:	1	0	0	0
Mass media and informal sources	1	-	-	-
Four sources of influence or information:	3	0	0	0
Traditional, mass media and institutionalized sources	3	-	-	-
Total*	100	100	100	100

institutionalized sources decreased a great deal. Among the sources of learning, institutionalized sources ranked highest in teaching the farmers how to use fertilizer. Next in importance were the informal sources. This implies the importance of local leaders in extension work. The local traders also played a limited role at this stage. The role of traditional leadership at this stage was at a minimum.

Progress in the Use of Superphosphate

Table 35 gives figures about use of superphosphate for the last ten years. A large number of superphosphate users in 1961 is explained by the fact that fertilizer was available on sale at subsidized rates that year. The previous prices of superphosphate were very high and did not encourage many farmers to use it.

TABLE 35

PERCENTAGE OF FARMERS WHO USED SUPERPHOSPHATE EVERY YEAR SINCE 1951 AMONG 100 SAMPLE FARMERS

Year	Percentage
1951	2
1952	3
1953	1
1954	2
1955	3
1956	7
1957	9
1958	3
1959	8
1960	9
1961	28

It has been explained that thirty-seven per cent of the farmers have once used superphosphate. On the other hand, in 1961 only 28 farmers used it. The difference between the two figures can be explained by the fact that either these nine farmers have not accepted the use of

fertilizer (though they have used it once), or they have not used it because they cannot get it, due to any one of the various reasons mentioned in the preceding pages.

Characteristics of Fertilizer Adopters

Table 35 (page 192, above) indicates that in 1961 twenty-eight farmers used the fertilizer. During this year the fertilizer was distributed on sale at subsidized prices. No fertilizer was given free during this year. There was no coercion or force applied by any source of influence, to get the farmers to use superphosphate. These farmers secured fertilizer from the depots of the Ministry of Agriculture and through normal trade channels in the rural areas. It can, therefore, be assumed that these 28 farmers are the genuine adopters of superphosphate. There may be more farmers who are genuinely convinced about its usefulness, but have not used the fertilizer in this year.

Since the adoption and distribution of fertilizer has always been controlled, the process of its adoption has not taken place as it may take place in another situation where the normal forces of supply and demand compete. Therefore, it is not valid to differentiate the adopters of superphosphate into conventional categories of innovation adopters according to time of adoption. The data available are not adequate to categorize adopters according to time for comparison. For the purposes of further discussion, therefore, these twenty-eight farmers will be grouped as "adopters" and compared with all other "non-adopters" for characteristics.

Location

Table 36 indicates that a comparatively large percentage of adopters of superphosphate live in the "point of contact" villages as compared to non-adopters. Similarly a smaller percentage of them live in category B and category C villages, as compared to non-adopters.

TABLE 36

LOCATION OF ADOPTERS AND NON-ADOPTERS OF SUPERPHOSPHATE

Location	% of adopters	% of non-adopters
Live in point of contact villages	39	12
Live in category B villages	36	42
Live in category C villages	25	46
Total	100	100

Within the communities, 90 per cent of the adopters live in the central villages as compared to 58 per cent of the non-adopters. The figures for living outside the main villages are 10 per cent for adopters and 42 per cent for non-adopters.

Tribal Affiliation

Table 37 gives the figures for adopters and non-adopters of superphosphate. It can be seen that 96 per cent of the adopters are settled Hausa as compared to 74 per cent of the non-adopters. There are more Pagans and Cattle Fulani in the non-adopters.

TABLE 37

TRIBAL AFFILIATIONS OF ADOPTERS AND NON-ADOPTERS OF SUPERPHOSPHATE

Tribe	% of total adopters	% of total non-adopters
Settled Muslim Hausa	96	74
Cattle Fulani	0	14
Pagans	4	12
Total	100	100

Age

Younger age seems to have a relationship with the adoption of superphosphate. The range of age for adopters of superphosphate was 23-65 years as compared to non-adopters whose range of ages was 18-66. The average age for adopters is 39 as compared to 44 years in the case of non-adopters. The modal age for adopters is 30 years, as compared to 50 in the case of non-adopters.

Socio-economic status

The percentage of political titleholders was more in the case of adopters as compared to non-adopters. The same is true for traders. Eighteen per cent of the adopters of superphosphate were political titleholders as compared to seven per cent for non-adopters. The percentage figures for traders are the same. There is not much difference between the adopters and non-adopters of superphosphate according to acreage of land holdings cultivated. The average holding for adopters is about 7.5 acres, whereas the average holding for non-adopters is 6.7 acres. Sixty-eight per cent of the adopters cultivated Fadama land

as compared to 48 per cent in the case of non-adopters.

Education

Education of the farm operators has been found to be related to progressiveness in adoption of farm practices. Table 38 shows the educational levels and interests of superphosphate adopters and non-adopters.

TABLE 38

EDUCATIONAL LEVELS AND INTERESTS OF SUPERPHOSPHATE ADOPTERS AND NON-ADOPTERS

Particulars	% of adopters	% of non-adopters
Reads nothing, writes nothing	36	51
Can read Arabic only	7	10
Can read and write Arabic	39	34
Can read and write Arabic and Hausa	18	5
Buys and read books	54	25
Has listened to radio	32	18

Among the non-adopters there is a greater percentage of illiterates as compared to adopters of superphosphate. Adopters include a greater percentage of farmers who can read and write Arabic and both Arabic and Hausa. A greater percentage of adopters buy books and listen to radio as compared to non-adopters.

Contact with Extension Workers

A greater percentage of non-adopters of superphosphate have no contacts with the extension workers, as compared to adopters. More of the adopters had contacts with three and four extension workers as compared to non-adopters. The difference between non-adopters and adopters

for contact with one and two extension workers was small.

TABLE 39

CONTACTS WITH EXTENSION WORKERS OF ADOPTERS AND NON-ADOPTERS

Number of contacts	% of total adopters	% of total non-adopters
Contact with no extension worker	3	30
Contact with one extension worker	14	27
Contact with two extension workers	22	14
Contact with three extension workers	50	26
Contact with four extension workers	11	3

Other Improved Farm Practices Followed

Among the adopters of superphosphate, a lesser percentage had adopted no other improved farm practice as compared to non-adopters. Seventy-five per cent of the adopters of superphosphate had adopted two or more other improved farm practices as compared to 48 per cent among the non-adopters.

A study of the characteristics of superphosphate adopters helps to understand the progressive farmers who take up new ideas comparatively easily. Extension workers should always try to locate such farmers in the villages in order to introduce new ideas. The role of informal sources of information or influences at all stages of the adoption process in this area indicates that farmers rely heavily on such sources in adopting new ideas. Therefore, the extension workers should do well by working with these progressive farmers and using them as volunteer local leaders in further accelerating the process of agricultural improvement.

Farmers' Reasons for Non-adoption of Superphosphate

Those farmers who have not used superphosphate thus far were asked for reasons for not using it. Out of sixty-three such farmers in this study, thirty-five said that the cost is high and they do not have money to pay. Eight per cent said they do not know where to buy it. Twelve per cent of the farmers indicated that they are not quite convinced of its value. Four per cent said they have enough cattle manure. The remaining farmers said they didn't use it because nobody else around their village uses it.

Attitudes Towards Future Use of Superphosphate

Farmers were asked if they intend to use superphosphate in the future. Ninety-four per cent of the farmers replied in the affirmative. Out of these ninety-four, thirty-seven per cent said they are convinced about its usefulness. Another twenty-seven per cent said they want to see its effects on crops (trial or pre-trial stage). Two farmers said they wanted to compare it with Fulani manure. The remaining farmers said they want to use it in order to increase the yields.

Six per cent of the farmers do not intend to use superphosphate. Four per cent of them argue that they have enough cattle and compound manure. The other two per cent did not give any reason.

CHAPTER X

SUMMARY AND CONCLUSIONS

It was the aim of this dissertation to collect, analyze, and interpret data of a socio-economic and educational nature from a selected rural area in Northern Nigeria which may help establish some hypotheses for the conduct of extension education work in this area.

In order to obtain relevant data, two different interview schedules were designed. One was used to collect the community level data. This schedule was used in the first phase of the study to serve an exploratory function. The second schedule was used to collect data from one hundred farmers who were selected from a stratified random sample of villages. The sample of farmers was stratified to allow for tribal as well as socio-economic representation. Other sources of data were personal observation, written records of the administration, and earlier researches. Experience in this research indicates that any research that involves the traditional leadership and power structure of the area in its planning and execution can be done with a reasonable degree of success in Northern Nigeria. The most important function of this power structure is legitimizing the research plan and giving the rural people a feeling of security against any ill effects of the research findings.

The data thus obtained were analyzed and presented in Chapters III to IX of this dissertation. In the discussion of the data in each chapter, certain conclusions were drawn and their implications for extension education work were pointed out. In this chapter, these conclusions and implications are brought together.

A study of ecological conditions in the area indicates the general framework within which an educational program for the improvement of farm production and levels of living has to work. The markedly seasonal nature of agriculture gives a clear indication of the program activities to be undertaken by the extension service during different times of the year. Education for fadama cultivation during the dry season and for upland cultivation during the wet season should be emphasized. Educational work on activities related to livestock and other non-farm activities should be done during the dry season. During the wet season, personal contact with individual farmers through farm visits seems to be an effective way of doing extension work, whereas group teaching in the villages through village visits should form the central activity of the extension workers during the dry season. The extension service can work more effectively if in-service training activities, staff conferences, seminars, training of local leaders, and the arrangement of farm supplies supporting the educational activities are conducted during the dry season. Such procedure will allow more time for educating the farmers during the short wet season.

Rural roads and transport facilities set limits for extension work. Villages with bad roads should be visited more often during the dry season and supplies should be transported to such villages before the rains start.

The influence of patterns of settlement on the learning of new methods and practices of agriculture has been shown throughout this dissertation. People living outside the main villages in this area are learning fewer new and improved practices than those living in the main villages. Contact between extension workers and farmers living outside of the main villages is much less than with farmers living in the main villages. On the other hand, the activities of farmers who live outside of the main villages are oriented towards land, livestock, and plants. For these reasons, a substantial and important portion of the rural population does not receive adequate education. Extension workers could do well through extending their activities to all rural people equally. The density of population per square mile, the types of settlement patterns and the conditions of rural roads and transport should be considered when deciding on the number of extension personnel. The number of personnel at the field level as well as at the supervisory levels should increase proportionately for a given area, on a given educational job, with the increase in all or any one of the three factors just discussed.

Sex and age composition of the rural population, especially family heads, has implications for decision making on the farms and, thus, indicates the future scope for changes in agriculture. It is often considered that the age of the extension worker in relation to the age of the farmer is an important factor in introducing change in traditionally oriented societies. It is generally believed that the older the extension worker, the more changes in farming he can influence. This hypothesis needs to be tested.

In Chapter IV the structure of the rural government and its relationship with extension work has been outlined. The Ministry of Agriculture is supposed to provide the Native Administrations with technical information. The Ministry is technically oriented, whereas the nature of working and administration of the Native Administrations is mostly non-technical and diffuse, based on personal considerations. Under the present circumstances, evidence indicates that the extension work is relatively ineffective among farmers. This situation supports the generalization that when information has to pass from one system to another, the flow of communication is usually restricted. This is especially true when the nature of orientation of the two systems is different. The experience in Northern Nigeria also provides evidence that when the head of the receiving structure consciously tries to establish linkage, the flow of communication across system lines becomes easy. This implies that the Ministry of Agriculture personnel should conduct educational work among the heads of the Native Administrations in order to create an awareness among them about the importance of extension work.

The organization at the district level in Northern Nigeria implies that the local extension workers can be more effective by enlisting the help of the District Head, the District Council, and the representatives of the other rural service agencies than by not coordinating with them. The members of the District Council can be organized into a district program planning committee and their help in respective communities can be utilized for gaining support and for establishing rapport.

Based on personal observations of the writer and discussions with the Ministry of Agriculture and Native Administration employees,

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Based on personal observations of the writer and discussions with the Ministry of Agriculture and Native Administration employees,

some suggestions for improvement in cooperation and coordination between the Ministry and the Native Administrations have been formed, which include:

1. The Ministry should subsidize the salaries of the trained staff of the Native Administrations.
2. Employees of the Native Administrations should be given opportunity to move up to supervisory jobs in the extension service of the Ministry of Agriculture.
3. The Ministry of Agriculture should help the Native Administrations in the training of their staff.
4. The old, untrained and illiterate staff should be replaced with trained, educated extension workers.
5. Control of the agricultural officers should be increased in matters of administration and hiring of the Native Administration staff in the interest of efficiency and effective working of the extension service.
6. The long term objective should be to unify the extension service with participation of the government and Native Administrations.

Trade centers and rural markets in Makarfi district offer excellent opportunities for extension work in Northern Nigeria. Most of the bigger villages have rural markets which are often visited by the rural people. Extension workers should visit the markets for purposes of contacting the farmers and for distribution and display of information material. Result and method demonstrations can be arranged advantageously in the fields around the market place. It is expected that extension workers can be more effective in their educational job if they use the rural markets. Agricultural supplies and equipment can also be distributed through the rural markets.

In Chapter V are discussed the remaining aspects of the rural social structure. The spatial grouping of the rural people has been

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In Chapter V are discussed the remaining aspects of the rural social structure. The spatial grouping of the rural people has been

described under the subjects of community and neighborhood. A rural community is composed of neighborhood units organized into a bigger central village surrounded by satellite hamlets and smaller units of residences. The most prevalent features that distinguish one community from another are the members' feelings of belongingness and the paying of tax by all adult males to the community chief. The political organization of the local communities contains a village head who collects tax and serves as the link between the district level and the community level administrations. He is assisted by a group of courtiers who help him in the village administration. This group of village elite is most influential at this level. Extension workers must gain their confidence in order to gain rapport and to introduce changes in the farming systems. The legitimizing function of the village chief should be utilized for introducing changes. It is hypothesized that an extension worker can bring about more changes in farming in the communities of Makarfi district by working through the village elite than by working directly with the farmers. Help of the ward-heads may be secured while working in the hamlets.

Each professional group in the rural communities is represented by a headman in community affairs. The carpenters and blacksmiths, if they are trained, can help the extension workers introduce changes in agricultural tools and equipment. In each community there is a chief of the farmers who is selected by the village head. It would be worthwhile to test the effectiveness of his leadership for extension work as compared to other potential volunteer leaders. In most of the rural communities, rural girls and boys are organized into separate groups. The chief of the young men is selected by the village head. It would be

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useful to test his appropriateness as leader as compared to other prospective rural youth leaders in the organization of youth clubs.

The people of Makarfi district attach prestige to age and sex. Older age and male sex are higher in the hierarchy of social relations. Other such factors are ethnic origin, religion, education, wealth and occupational class. Settled Fulanis and Muslim Hausa are higher than cattle Fulanis and Pagan Hausa. Settled Fulanis are also considered higher than Hausa. The Muslim religion, because of its association with the rulers, takes precedence over the Animism. Wealthy people are respected. Lowest of all professions in prestige are butchering, praise singing, and drumming. Education is valued by the rural people and educated persons are held in esteem.

Rural life in Makarfi district is largely organized on an informal basis. Among the informal groups that exist in Makarfi are the adashi and gayya. The possibilities of organizing local informal groups into formal organizations of an economic nature should be explored.

Discussion of the rural family structure and composition has been given at the end of Chapter V. There are two major family types found in this area. Gandu type family is the composite family, where more than one nuclear family acts as units of production and consumption. The Iyali is the nuclear family. The overall average size of a family is eight in this area. The average size of the nuclear family is six and that of the Gandu twelve. Pagan families are larger than cattle Fulani and Hausa families. The average size of the cattle Fulani family is larger than the Hausa family. Age composition indicates that the nuclear families have a slightly larger proportion of children and older people than Gandus. The age group which usually forms the

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farm labor is larger in Gandus.

Male family heads make all decisions concerning farming; the average age of family heads in nuclear families is younger than in Gandus; moreover, younger farmers adopt more improved practices. Therefore, it is logical to assume that nuclear families are more suited for extension work than Gandus. On the other hand, Gandus have more farm labor and probably have more capital; hence, they are more suited for intensive agriculture. Further research is needed to clarify which family type is more suited to changes in farm practices and consequent improvements in farming.

Some discussion about salient features of education and means of communications has been given. The use of existing educational facilities such as rural primary schools and adult education centers for extension work have been stressed. Rural schools can be utilized for organizing agricultural clubs for young boys. Adult education centers offer a good situation for classroom teaching of adults on the subject of agriculture. In this connection, coordination of extension work with adult education is an obvious recommendation.

Literacy levels of family heads indicate that a large number of family heads can read and/or write in Arabic script as compared to those who can do so in English script. This implies that the use of agricultural information material in Arabic script has a larger potential audience than material produced in English. Pagans, cattle Fulanis and the farmers living outside of the main villages are not as literate as farmers living in the main villages. Therefore, more emphasis on teaching through personal contact should be given to this section of the clientele. A large percentage of farmers who can read and/or write

also buy reading material. This indicates their interest in reading and, consequently, is an indication of the opportunity to use written agricultural information material.

The data presented on the use of radio as a means of communication indicate that there were 63 radio sets in this area in 1962. Though only one of the sample farmers owned a radio, 22 of them had listened to a radio program. The farmers listen to radios which are distributed as community listening sets by the Native Administration, or the radios privately owned by other farmers, relatives, and traders. Twenty out of twenty-two farmers who had listened to a radio had also listened to an agricultural program. This indicates the potential interest of farmers in listening to agricultural programs, and a need for working out a well rounded regular program for rural listeners. Inquiries indicated that the farmers are interested in listening to regional news in Hausa, readings from Holy Koran, and Hausa music. The proposed program for rural listeners should contain these items of consumers' interest along with information on current agricultural topics. It appears that information on agricultural topics can be supplied to the farmers better when the work of the extension service is supplemented with radio as compared to extension service working without radio support in Northern Nigeria.

Chapter VII contains information on the ways and means by which rural people make their living. All of the sample farmers in this study cultivated land during 1961. Ninety-five per cent of the farmers were rearing livestock of different kinds in varying combinations in addition to the cultivation of land.

In this area the average size of land holdings is about seven acres per family. The range in holdings of cultivated land is from 1.08 acres to 31.60 acres. The size of land holdings for those farmers who live outside of the main villages is larger than the holdings of the farmers living in the main villages. Pagan families have the largest average size of holdings. Ninety-five per cent of the families in this sample owned their own land; the rest rented it from other people. Land holdings are very fragmented and are at varying distances from the villages. In most of the cases, the decisions for crop growing are made by the male heads of the households. Of the two major land types described, fadamas seem to be an equally important source of cash income, though most of the family food is produced from the upland farms. Since fadama cultivation does not clash with the cultivation of upland farms, it has been suggested that the extension workers should concentrate on teaching the cultivation of fadamas during the dry season. Conservation of water and its use in the irrigation of fadama lands are two of the subjects which should be stressed.

Among the different farm operations performed by rural families, women taken part in appreciably large numbers in the sowing of seeds, picking cotton and cowpeas, and in the preparation and conservation of farmyard manure. All other operations are predominantly performed by men, except in the case of Pagan families where women perform all of the farm operations. Women in cattle Fulani families process and sell milk in addition to the farm work. This implies that any improvement in farm operations where women take a prominent part should be brought about through home economics extension programs, because in the case of Muslim families men extension workers cannot work with

women. Such subjects should also be included in the training program of home economics extension agents.

Harvesting of sugar cane and groundnut decortication are the two operations which are not being performed by a large number of families. The reasons are the lack of capital and skills and knowledge on the part of farmers related to these operations. A credit program combined with education on the subject of "how to grow sugarcane and convert it to sugar" would bring increased income to the rural families through effective exploitation of the fadama lands. Similarly, if the farmers are taught and helped to decorticate their own groundnuts, they can get better prices for them.

Inquiries were made about where farmers get their farm supplies. In the case of cash crops, a larger percentage of farmers buy their seed; in the case of food crops, most of the farmers store their own seeds. This implies that cash crop seeds can be introduced through regular trade channels and through the markets. In the case of food crops, the introduction can be effected by exchanging the old seeds for new ones. It has been suggested that the local farmers may be selected and trained in the production of new seeds under the direction and supervision of extension workers.

Chemical fertilizers, insecticides and fungicides are recent introductions in this area. Very few farmers have taken up these practices so far, but the need and interest of farmers in these new introductions has been demonstrated in this dissertation. The present level of credit requirements for these requisites has also been shown in Chapter VII, along with the sources and duration of credit. New

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programs of agricultural introductions should provide for credit requirements of agricultural requisites at an increased rate. It has been suggested that the credit on agricultural requisites should be coordinated with extension education. Otherwise, advancing credit without education may merely mean increased rural indebtedness.

It was discovered in this study that 88 per cent of the farmers pursue subsidiary activities other than cultivation of land in order to earn more food and cash. The importance of these activities to the local rural people will continue as long as the nature of agriculture is seasonal. Therefore, the rural development programs must include and provide for the improvement of knowledge and skills of rural people concerning these additional activities.

The last two chapters of this dissertation deal with changes in agricultural patterns, methods, and techniques. The present level of farmers' knowledge about improved agricultural practices is very low. Farmers have been found to be interested in improved agricultural practices in this area. A large percentage of them are dissatisfied with the present levels of their cash and food crop production and a large number are willing and interested in new things about farming.

Among the prevalent influencers for change are the institutionalized agencies such as the Ministry of Agriculture and the Nigerian Tobacco Company. Traditional sources are very strong influencers for changes in agricultural practices provided they are interested in bringing about the changes. Among other sources of influence are the mass media and the trade sources. Samaru Agricultural Station has exercised a very limited influence on the change of agricultural patterns and methods in this area. Informal sources such as friends,

relatives, and other farmers and neighbors are also very important influencers of change.

An evaluation of the effectiveness of the different types of extension workers has been made. It has been found that the Nigerian Tobacco Company extension worker is the most effective of the other three types of extension workers. He has made more farm visits and farmers have reported learning more specific things from him than from other extension workers. Makarfi area farmers learned more things from extension workers when two-way communication between the extension workers and the farmer took place. The data reported in this dissertation indicate that the two-way communication between the extension worker and the farmers took place in more familiar situations, such as at the time of visits of the extension worker to the villages or to the farmers. This implies that village visits and farm visits are quite effective in changing the traditional patterns of agriculture. Another implication of this finding is that a larger extension staff is necessary to conduct extension work with this method. At present, the total contacts of extension workers with the farmers are, on the whole, very low. Either a larger number of extension workers than at present is required, or the efficiency of the existing extension workers needs to be increased so that they can approach more farmers and thus bring about more changes. It has also been demonstrated that the extension workers have much better contact with the Hausa farmers than with the cattle Fulanis and Pagans. More farmers living in the main villages reported having had contact with one or more extension workers than those farmers living outside of the main villages.

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An assessment of the improved farm practices taken up by the farmers indicates that, on the whole, very few changes in agriculture have taken place. Farmers living outside of the main villages use fewer improved farm practices as compared to farmers living in the main villages. Wherever changes have taken place the sources for learning are mostly informal, traditional, and institutionalized.

Chapter IX deals with a study of the diffusion of superphosphate fertilizer in Makarfi district. The study has been divided into four adoption stages according to when the farmer first heard about, when he first saw the fertilizer, when he received or procured it, and when the farmer first used superphosphate. Since the spread of superphosphate in this area has not taken place under normal conditions, it is not possible to divide the fertilizer adopters in different categories according to the time of their adoption. Two general categories have been designated, i.e., adopters and non-adopters. These two categories have been compared in terms of their characteristics. Most of the adopters live in the main villages as compared to non-adopters. A great percentage of them live in the points of contact villages and other villages near the points of contact villages as compared to non-adopters. A greater percentage of them are educated, buy materials to read, and had listened to radio. A larger percentage of them are Hausa as compared to Fulani and Pagans. Farmers in a higher socio-economic status and farmers who also trade have a greater percentage of fertilizer adopters among them. The adopters have more contacts with a greater number of extension workers as compared to non-adopters.

A study of the characteristics of superphosphate adopters can help the extension workers gain understanding of the farmers who are

progressive and would try a new idea readily. The extension workers should try to locate such farmers in the rural communities and work with them in order to introduce new ideas and practices in agriculture. A study of the influences prevalent at different stages in the process of adoption of fertilizer indicates that the traditional, informal, and institutionalized sources are quite important at almost all stages. At a stage in the adoption process when the farmers were convinced about the use of superphosphate the informal sources were more prominent. Institutionalized sources were very prominent at the stage when farmers learned the use of superphosphate. Mass media has not played an important part at any stage in the adoption process. This is perhaps due to the fact that the mass media is not developed in Northern Nigeria to the same extent as in technologically developed countries. Extension workers can use these data as guides to their educational approaches while introducing new changes in agricultural practices in this area.

Application of the Results

In applying the findings of this study, one should recall that it was conducted in an area of 500 square miles. This is pointed out in order to emphasize that the data reported comes from a small area and may not represent the entire Northern Nigeria. Northern Nigeria is a large country with various vegetation and soil zones as well as with various ethnic areas. The area studied was selected in the Northern Guinea Vegetation Zone. Personal observations from travel in the Northern Guinea Zone indicate that the findings of this study may not be applicable to the entire Northern Guinea Zone, especially so in areas inhabited by people of ethnic origins other than Hausa-Fulani.

First, the findings can be used in order to decide and formulate policy at the regional level of the Government of Northern Nigeria. In this dissertation, recommendations have been made about coordination of extension work with different ministries in order to support and supplement the work of the Ministry of Agriculture. The data reported can also be used in formulating policies of cooperation and coordination between the Native Administrations and the Ministry of Agriculture in carrying out extension work effectively.

Second, the findings can be used in the preparation and carrying out of a program of agricultural information at the regional level. Data regarding the educational interests, needs, and requirements reported can be helpful in preparing agricultural information materials and programs.

Third, the data from this study can be helpful in training extension workers. The study has helped to clarify the areas of training in agriculture which should be included in the training of home economics extension agents and agricultural extension agents.

Fourth, some of the material included in this study can be helpful to the extension workers in the field as well as to the workers under training as reference material. They can compare it with their respective areas and apply the principles with modification in their work.

Fifth, the data can serve as a baseline survey for further studies now, and for change over-time studies, in future, in order to measure the trends and rate of agricultural changes in this area.

Implications for Future Research

Even though a large amount of data has been collected and compiled in this study, the author feels that he has only scratched the surface. First, more research is needed in several individual areas reported in this study. Indications for further research and experimentation have been made in the dissertation from place to place. In summary, some of them are as follows:

1. Research is needed in order to find out the number of extension workers required for normal extension work among ten thousand farm families living in Makarfi district with the existing pattern of settlement, density of population, and the condition of rural roads.
2. What are the effective methods of communicating information with farmers living outside the main villages.
3. Whether the individual family or Gandu-type family is more suited for change of practices and consequent agricultural development.
4. The influence of age of the extension worker in relation to the age of the farm decision maker on the change of farm practices need to be discovered.
5. More research is needed in order to find out whether extension work can be carried out as under the present conditions or a unification of extension service is required with the Ministry of Agriculture.
6. A detailed research is required on the effectiveness of different extension education methods and their combinations under Nigerian conditions.

7. Further research is needed in order to clarify the role of traditional leaders in rural communities as agricultural leaders.

Second, the hypotheses suggested in the form of recommendations in this study need to be tested on a pilot basis before they are applied on a large scale. Third, a great deal of the data collected has not been thoroughly analyzed. Such data can be used for supplementary analysis work.

Concluding Statement

The general purpose of this study was to throw light on some of the salient features of rural life important in extension work in Makarfi district of Northern Nigeria. The study was exploratory and descriptive in nature and has neither attempted to answer all of the questions nor has given conclusive answers to any one of them. It has, however, established the importanee of studying local socio-economic and educational conditions before starting extension work in new countries. The study has demonstrated that the patterns of socio-economic and educational aspects of rural life differ in different countries. Therefore, it is not correct to transfer patterns of extension work from one place to another without due regard to local conditions.

As was pointed out in the beginning, the study rests on the assumption that a knowledge of the socio-economic and educational conditions of a country is basic and necessary to technical assistance personnel for establishing effective extension work in a country. The value and usefulness of the findings of this study, therefore, will depend upon the extent to which the aspects of rural life pointed out in the study are identified and made use of in establishing extension work.

APPENDIX I

No. _____

VILLAGE SURVEY SCHEDULE

Name of the village _____ Date of filling _____

1. Number of wards _____

2. Number of hamlets attached to the village _____

Name of the Hamlet	Population
_____	_____
_____	_____

3. Distance (from Zaria-Kano road) in miles _____

   Distance from the railway station in miles _____

4. Total Population _____

   Hausa _____ Fulani _____ Others (specify) _____

	Under 15 years	Between 15-45 years	Above 45 years
Male	_____	_____	_____
Female	_____	_____	_____
Total	_____	_____	_____

5. Livestock (Numbers)

   Cattle _____ Sheep _____ Goats _____ Poultry _____

6. Crops grown

   Cash crops _____

   Food crops _____

7. Education Number of people who can

   Read Hausa _____ Read Arabic _____ Read Arabic and Hausa _____

Number of persons who can

Write Hausa_____ Write Arabic_____ Write Hausa & Arabic_____

Number of schools_____ Number of pupils: male_____ female_____

Number of Arabic schools_____ Number of pupils_____

8. Radios

Total_____ Privately owned_____ Given by N. A._____

Where are the radios played usually (specify)(Private and N. A. separately)_____

What kind of radio programs people in this village like to listen to

_____

About what time of the day are the radio sets in this village often played?_____

Are all the radio sets in this village working; if not how many

private_____, N. A._____ sets are not working

What are the reasons for not working_____

9. Reading material

What kind	How often	Who brings it	Do other people listen

10. Does this village have a market of its own? Yes_____ No_____

If yes, what days is it held_____

Which other market do people from this village use in order of priority_____

1st priority:_____ 2nd _____ 3rd_____ 4th_____

11. Where do you sell the following crops?

Name of crop	Market used	Means of transport
Cotton		
Groundnuts		
Sugarcane		

12. Professional groups in the village

Name of the profession	Number of households

13. Formal and informal organizations in this village

Name of formal organizations	Membership

Name of informal groups	

14. Festivals and ceremonies in this village

Name of the festival or ceremony	Time of the year	Duration	Purpose

15. In-migration

Do people from other parts of the country come into this village?
Yes_____ No_____

If yes, from where_____Approximate number each year_____

What kind of work do they do in the village_____

What time of the year do they come_____When do they go back

_____

Why do they come here_____

16. Out-migration

Do people from this village go out during any part of the year?
Yes_____ No_____

If yes, where do they go_____Approximate number each year_____

What kind of work do they do there_____

What time of the year do they leave the village_____

What time do they come back_____

Why do they go out_____

17. Farm Supplies

Where do you get your cash crops seeds_____

Where do you get your food crops seeds_____

Where do you get the fertilizer_____

Where do you buy the farm tools_____

18. Name five most influential people in this village.

_____
_____
_____
_____
_____

19. Name five best farmers in this village.

_____
_____
_____
_____
_____

APPENDIX II

INTERVIEW SCHEDULE

Record No. _____
M. F.

SOCIO-ECONOMIC SURVEY OF PEASANT AGRICULTURE N. NIGERIA, ZARIA PROVINCE, MAKARFI DISTRICT

Date ..... Interviewer ..... February, 1962

Identification of Village

Village Name ..... Location — A. B. C.

Tribal Composition Approx. Population, No. .....

(%) Fulani ..... Hausa ..... Kanuri .....

Magazuwa ..... Other .....

(TO BE ASKED OF HEAD OF HOUSEHOLD - MAIGIDA)

I.1. Name of Head of Household .....

2. What is your tribe? .....

3. Are all the people living in this house of this same tribe?

Yes ..... No .....(If no, ask) Who belongs to what other tribe? .....

4. What languages do you speak? .....

What languages do you read? .....

What languages do you write? .....

5. His Religion? .....

6. His age at present? .....years Age when first married ...

7. Do you practice Kulle? Yes . . . . . No . . . . .

(If yes, ask) Which type? Kulle . . . . . Tsari . . . . .

8. His Major Occupation and/or Status — (write in other occupation)

Title Holder . . . . . Also . . . . . .

Trader . . . . . Also . . . . . .

Farmer . . . . . Also . . . . . .

9. How many of the men or boys living in this compound now help you on the farm? . . . . . .

Do you call for gayya? Yes . . . . . No . . . . . .

Do you hire farm labour? Yes . . . . . No . . . . . .

(TO BE ASKED OF MAIGIDA)

II. 1. How many people do you feed? . . . . . .

2. Would you tell us who these people are, their relationship to you, their approximate ages and whether or not married?

Particulars	Wives	Children	Grand-children	Other Adults (spec. rel. ship)	Other children (specify rel. ship)	Total
Jinjiri Baby, breast fed 0-2 years						
Yayayyu weaned 2-3 years						
Yara Boys 4-12 years						
Samari Unmar. male 12-20 years						
Yammata Unmarried female 4-15 years						
Balagaggu Married adult						

Particulars	Wives	Children		Grand-children		Other Adults		Other Children		Total
		m	f	m	f	m	f	m	f	
Gwauro Adult male, no wife at present										
Bazawara Widowed or Divorced female										
Tsoho Elderly man (dependent)										
Tsohuwa Elderly female (dependent)										
Total										

III. (TO BE ASKED OF MAIGIDA)

Education of any type (formal schooling or other) and uses of health and other services

Identification of persons having received or now receiving training or services

Type of Education or other Services	Relationship to Head of Family M-Maigida W-Wives S-Sons D-Daughters	Present age of person	No. of yrs of schooling	Location of School or Class or Services
Koranic School With a Mallam in this village				
With a Mallam outside of this village				
In this Compound				
N. A. School Junior Primary				
Senior Primary				
Provincial Sec. School				

Type of Education or other Services	Relationship to Head of Family M-Maigida W-Wives S-Sons D-Daughters	Present age of person	No. of yrs of schooling	Location of School or Class or Services
Voluntary School				
Mission School				
Junior Primary				
Senior Primary				
Private School				
Junior Primary				
Senior Primary				
Secondary School				

Services	Reason
Dispensary	
Clinic	
Hospital	
Adult Literacy Class (Public Enlightenment)	
Hygiene or Health Class	
Any other Service (specify)	

IV. (ASK MAIGIDA AND CHECK (v) with PENCIL (male interviewer). Then later and separately, female interviewer asks same questions of senior wife and checks (v) with PEN.)

1. In this household, who does the following things?

Activities or Responsibilities	Maigida	Wife	Children or Grandchildren male	Children or Grandchildren female	Other Adults (specify) male	Other Adults (specify) female	Other Children (spec.) male	Other Children (spec.) fem.
Clearing bush								
Burning bush								
Making ridges								
Marking out								

Activities or Responsibilities	Maigida	Wife	Children or Grandchildren male	Children or Grandchildren female	Other Adults (specify) male	Other Adults (specify) female	Other Children (spec.) male	Other Children (spec.) fem.
Putting seed in								
Earthing up								
Weeding								
HARVESTING:								
Guinea Corn								
Millet								
Cotton								
Sugar Cane								
Ground Nuts								
Cow Peas								
Cassava								
Yams								
Sweet Potatoes								
Vegetables								
Other -								
Thrashing crops								
Putting crop in Rumbu								
Removing crop from Rumbu								
Processing:								
Picks trash from Cotton								
Picks groundnuts (separate from stalks)								
Shells groundnuts								
Cooks cassava for home								
Cooks cassava for market								
Other								

Activities or Responsibilities	Maigida	Wife	Children or Grandchildren male	Children or Grandchildren female	Other Adults (specify) male	Other Adults (specify) female	Other Children (specify) male	Other Children (specify) female
Carry manure to fields								
Applies manure								
Gathering:								
Thatch								
Corn stalks								
Firewood								
Gravel (for floor)								
Bush fruits								
Leaves								
Other								
Herding (goats or sheep)								
Watering (goats or sheep								
Milking (goats or sheep								
House and feed poultry								
Other -								
Marketing:								
Preparing food to sell								
Selling prepared food								
Buying prepared food								
Buying food ingredients								
Transportation:								
Head loaded								
Donkey								
Lorry								
Bicycle								
Other								

Activities of Responsibilities	Maigida	Wife	Children or Grandchildren		Other Adults (specify)		Other children (specify)	
			male	female	male	female	male	female
Other farm activities								
House repairs								
Thatching								
Plastering								
Fetching water								
Specify location of well: in compound								
not in compound								
Stream or river (distance)								
Care of young girls								
Care of young boys								
Preparing grain (for food)								
Cooking meals								
Cleaning dishes								
Cleaning (sweeping) sleeping huts								
Cleaning compound								
Cleaning salga								
Airs, repairs mattress								
Hires washerman								
Washing small clothes								
Washing large clothes								
Repair or mend clothes								
Make clothing								
Embroider clothing								
Knit (anything								
Sew (anything								

Activities or Responsibilities	Maigida	Wife	Children or Grandchildren male	Children or Grandchildren female	Other Adults (specify) male	Other Adults (specify) female	Other children (specify) male	Other children (specify) female
Crafts								
Spinning (mazari)								
Weaving (small loom)								
Weaving (large loom)								
Mat making								
Barber								
Hairdresser								
Other								
ASK ONLY PAGANS								
Brewing beer								
Selling beer								
Buying beer								
Other Activities								

V. Personal Characteristics

1. Are you a member of (check)

   Village Council . . . . . A co-operative . . . . . .

   Religious group . . . . . A dashi . . . . . .

2. Have you been in the Army? If yes, how many years . . . . Where . .

3. Do you hold any village titles? If so, which . . . . . .

4. If you are educated, what kind of things do you read:

Name	Where do you get them	How often	Borrow of buy	Reasons for reading

Do you own a radio . . . . . If yes, what kind of programs do you usually listen, name(s) . . . . . day(s) . . . . . time(s) . . . . . .

Do you listen to any agricultural programs? . . . . . If so, name . . . . . .

5. Do you live in the main village? Yes . . . . . No . . . . .

If No, how far is your hamlet? distance . . . . walking time . . . .

Are you a native of this place? Yes . . . . . No . . . . .

If No, where else do you come from? . . . . . .

How long have you been in this village? . . . . . .

6. What kind of house do you have? (check)

Round huts . . . . . Square huts . . . . . .

Thatched compound wall . . . . . Mud compound wall . . . . . .

Do you own (check)

Bicycle . . . . . Sewing machine . . . . . G. Nut decorticator . . . . . Gramophone . . . . . Watch or clock . . . . .

Horse . . . . . S. cane crusher . . . . . Weighing balance . . . . . .

7. Do you work on the farm yourself? Yes . . . . . No . . . . .

8. What other things do you do besides farming? (Check)

Particulars	Dry season		Wet season	
	Yourself	Other members of family (spec.)	Yourself	Other members of family (spec.)
Trading in the local market				
Trading away from village				
Sewing				
Govt. or N.A. service				
Fertiliser agent				
Agent of company (specify)				
Dillali				
Blacksmith				
Leather work				
Butchering				

Particulars	Dry season		Wet season	
	Yourself	Other members of fam. (specify)	Yourself	Other members of fam. (specify
Barbering				
Shop keeping				
Farm labour				
Others (specify)				

9. Please give information about the following persons? (check)

	N. T. C. Mallam	Cotton Mallam	Agric. Mallam	N. A.	Govt. Agric. Mallam
Have you ever seen					
Have you ever talked to					
If so, about what					
Has any of them visited your village					
Has any of them visited your farm					
Have you learned anything new about farming					
If yes, what					
Which one of them is of greatest help to you					

10. Was your father a farmer? Yes . . . . . No . . . . . If No, what was he . . . . . How did you happen to be a farmer . . . . . .

11. Are your son(s) going to be farmer(s)? Yes . . . . . No . . . . . If No, what are they going to be? . . . . . .

12. What would you like your son(s) to be? . . . . . Give reasons for your answer . . . . . .

VI. Farm Supplies
(During the last crop season)

1. Seeds

Particulars	Where did you get	Quantity	Whose responsibility is it to get	Borrowed bought or stored	Amount spent	Name the variety if you know
Groundnut						
Cotton						
Guinea corn						
Millet						
Sugar cane						
Tobacco						
Pepper						
Sweet Potato						
Cassava						
Onions						
Potato						
Rice						
Tomato						
Others						

Was any money borrowed for buying seed? Yes . . . . . No . . . . .

If yes, from whom . . . . . how much . . . . . when . . . . . .

how much are you supposed to pay back . . . . . when . . . . . .

2. Fertilizer

Particulars	Where did you get	Quantity	Whose responsibility it is to arrange	Borrowed bought or stored	Amt. spent
Superphosphate					
Sulphate of Amm					
Compound manure					
Fulani manure					

Was any money borrowed for manuring? Yes . . . . . No. . . . . .

If yes, from whom . . . . . how much . . . . . when . . . . . .

when were you supposed to pay back . . . . . how much . . . . .

3. Implements

Particulars	Where did you get	Number	Whose responsibility it is to get	Who made them	Amount spent
Garma					
Fartanyan					
Maigirbi					
Adda					
Lauje					
Wuka					
S. cane crusher					
Axe					
G'nut decorticator					

4. Insecticides

Particulars	Where did you get	Quantity	Whose responsibility it is toget	For what	Amount spent
D. D. T.					
Seed dressing					

Was any money borrowed for buying implements and/or insecticides?

Yes . . . . . No . . . . . If yes, from whom . . . . . how much . . . .

when . . . . . When are you supposed to pay back . . . . . .

How much . . . . . .

5. Compound Manure

What material is used to make compound manure? . . . . . .

Who collects it? . . . . . .

Where do you store it and the method of storing? . . . . . .

. . . . . .

Which farm do you usually apply this manure? . . . . . .

Who takes it to the fields? . . . . . .

How do you transport it? . . . . . .

What time of the year do you transport it? . . . . . .

Which crops are usually given this manure? . . . . . .

What time do you usually apply it? . . . . . .

Method of application? . . . .

Quantity applied last season? . . . .

VII. Seed and Grain Storage

1. Name of the Seed — Method and Place of Storage

Name of the Seed	Method and Place of Storage
. . . .	. . . .
. . . .	. . . .
. . . .	. . . .

2. Grain Storage (last year)

No. of Rumbus	Mud base	Matted base	Crops stored	When did you fill it	When was it empty	Was it infested last year
1.						
2.						
3.						
4.						
5.						
6.						

Are there any cracks in the mud based rumbus? Yes . . . . No . . . .

What kind of lid is there? . . . .

How do you preparetthe Rumbu for storage ? . . . .

Do you ever burn the old thatch in the Rumbu and sweep it out before

storage . . . .

VIII. Family Resources

1. Upland Farms

	No. of farms					
	1	2	3	4	5	6
Acreage						
Distance from home						
Who owns it						
Who decides what to grow						
Crops grown last sowing season						
Yield						
Crops sold in the market						
Amount						
Crops consumed in family						
Own or rent this land						
If so, from whom						

2. Fadama Farms

	No. of farms		
	1	2	3
Acreage			
Distance from home			
Who owns it			
Who decides what to grow			
Crops grown last sowing season			
Yield			
Crops sold in the market			
Amount			
Crops consumed in the family			
Do you own this land or rent			
If so, from whom			

3. Farms near Compound

	No. of farms		
	1	2	3

4. Livestock

	Chickens	Turkeys	Ducks	Goats	Sheep	Donkeys	Horses
No. at present							
Who owns them							
How many							
Who feeds and/or herds them							
Who decides to sell							
No. sold during last year							
No. of birds eaten last year							
No. of eggs eaten last year							
Why do you keep them							

5. Did you produce enough food for the family last crop season?

Yes . . . . . No . . . . . If no, what are reasons . . . . . .

. . . . . .

6. Did you produce enough crops for cash? Yes . . . . . No . . . . . .

If no, why could you not raise enough . . . . . .

. . . . . .

7. Would you like to raise more crops by learning improved farming methods? Yes . . . . . No . . . . . If no, give reasons . . . . . .

. . . . . .

8. Have you ever tried to learn a new method which raises more crops? Yes . . . . . No . . . . . If so, from whom and which . . . . . .

. . . . . .

9. Can you count any good methods which increase crop yields? . . . .

. . . . . .

10. If family head is absent, who decides what to grow? . . . . . .

If both of them are absent, who is the next? . . . . . .

IX. Family Expenditure (during the last year)

1. Food

Grains . . . . . Meat . . . . . .

Milk and milk products . . . . . Yam and Cassava . . . . .

Vegetables . . . . . Spices . . . . . .

Prepared food from the market . . . . . .

. . . . . .

2. Ceremonies and gifts

Marriages (specify) . . . . . .

Naming ceremonies (specify) . . . . . .

Gifts to (specify) . . . . . .

Others (specify) . . . . . .

3. Loans paid back

To whom	Amount	By whom	Purpose of taking a loan

4. Seeds and Fertilizers, Implements and Insecticides

Totals from previous pages . . . . . .

5. Other articles bought

Men's clothing . . . . . Women's clothing . . . . . .

Children's clothing . . . . . .

Other things . . . . . .

6. Travel (give details)

. . . . . .

7. Pilgrimage

. . . . . .

8. Religious festivals

. . . . . .

9a. Which one of these things will you prefer to spend your money on?

Education of the children . . . . . .
Pilgrimage to Mecca . . . . . .
More clothes for the family . . . . . .
More food for the family . . . . . .
Buying a horse . . . . . .
Getting another wife . . . . . .
Hire more labour for farm work . . . . . .
Better house . . . . . .
Buying more land . . . . . .
Buying good seed . . . . . .
Buying more fertilizer . . . . . .
. . . . . .

9b. Of all these activities which is the most important and why? . . . .

. . . . . .

X. Adoption of Fertilizer

	Super Phosphate	Ammonium Sulphate

1. a) Have you ever heard about fertilizer?

If so, when did you first hear about fertilizer?

b) Which one of these sources told you about it?

Village head . . . . . .
Village head's assistant. . . . . .

	Super Phosphate	Ammonium Sulphate
District head		
District head's agent		
A friend in the village		
A friend in another village		
Relative in the village		
Relative outside the village		
Neighbour		
Another townsman		
From U.A.C. agent		
Saw a poster about it		
Saw a film show		
Listened on the radio		
Read in the newspaper (specify) . . .		
In an agricultural show		
N.A. Agricultural Mallam		
Govt. Agricultural Office Mallam . .		
Govt. Agricultural Officer		
N.A. Wakilin Gona or assistant . . .		
N.T.C. Mallam		
. . . . .		

c) What did you hear about it . . . . . .
. . . . . .

d) Once you heard about it what did you do . . . . . .

2. When did you first see the fertilizer . .

Who showed it to you . . . . . .

What did he tell you about it . . . . .

What did you think about it . . . . . .
. . . . . .

3. When did you first get the fertilizer . . .

From where did you get it . . . . . .

Did you get it free . . . . . .

Did you buy it . . . . . .

Did you get it on loan . . . . . .

Were you forced to take it . . . . . .

How much fertilizer did you get . . . . .

Did you use it on crops . . . . . .

	Super Phosphate	Ammonium Sulphate
If no, what did you do with it		
Whitewash the walls		
Threw it in the bush		
Gave it tothe neighbor		
4. When did you first use the fertilizer . .		
Who in the family decided to use it . .		
How much fertilizer was bought		
Where did you get it from		
Who brought the fertilizer home		
How were you convinced to use it . . .		
5. Did anybody tell you how to use it . . .		
If yes, who		
How did he explain it to you		
If no, how did you find out how to use it		
Have you ever seen a demonstration on fertilizer		
If yes, on which crops		
What did you think of it		
Had you ever seen it used by another farmer before you used it		
If yes, name of the farmer		
His village		
Give his particulars		

6a. If you have been using the fertilizer, please state the quantity of fertilizer used every year since you started

Year	Superphosphate	Ammonium Sulphate	Where did you get it from
1951			
1952			
1953			
1954			
1955			

Year	Superphosphate	Ammonium Sulphate	Where did you get it from
1956			
1957			
1958			
1959			
1960			
1961			

6b. If you have not been using fertilizer for some years in the middle what were the reasons?

Year	Reasons

7. Details of fertilizer used in the last sowing season

Name of farm	Name of crop	Area fertilized	Time of application	Method of application	Quantity

What was the effect on crops? . . . . . .

. . . . . .

8. Has any other neighbour, relative, or farmer learned the use of fertilizer from you? Yes . . . . No . . . . If yes, who . . . . . .

Give his particulars . . . . . .

Which year did he learn from you . . . . . .

How. . . . . .

9. Do you intend to use fertilizer next year? Yes . . . . . No . . . . .

If yes, how much do you intend to buy . . . . . if this

quantity is bigger than last year, what are the reasons . . . . . .

. . . . . .

If no, what are the reasons . . . . . .

. . . . . .

Where can you get the fertilizer . . . . . Price . . .

10. If you have not used the fertilizer so far, what are the reasons?

You have never heard about it . . . . . .
Nobody in the neighbourhood uses it . . . . . .
You are not convinced of its use . . . . . .
Cost is too high . . . . . .
Do not know where to buy it . . . . . .
It is not available nearby . . . . . .
Because it is difficult to apply . . . . . .
Because you have seen other farmers fail . . . . . .
Because of a friend's advice . . . . . .
Because you do not have enough land . . . . . .

11. Would you like to learn how to use fertilizer . . . . . .

XI. Other Improved Agricultural Practices Adopted

Name of the practice	Do you do it or have it	If yes, when did you first learn about it	From whom and where	When did you first see it done	From whom and where	When did you adopt it yourself
1. Upright groundnuts						
2. Samaru G. corn						
3. Contour ridging						
4. Cross tying of ridges						
5. Use of seed dressing						
6. Spraying of cotton						
7. Grading of tobacco						
8. Dry season farming						
9. Use of G. nut decorticator						
10. Mixed farming						

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