EVALUATION OF FARM PRODUCTION GOALS AMONG FARMERS IN MAIGANA ZONE OF KADUNA STATE AGRICULTURAL DEVELOPMENT PROJECT

BY

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NOVEMBER, 1996

DECLARATION

I declare that this thesis has been written by me and that it is a record of my own research work. It has not been presented before in any previous application for a higher degree.

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CERTIFICATION

This thesis entitled "EVALUATION OF FARM PRODUCTION GOALS AMONG FARMERS IN MAIGANA ZONE OF KADUNA AGRICULTURAL DEVELOPMENT PROJECT" by Omolehin Ajayi Raphel Adeniyi meets the regulations governing the award of the Degree of Master of Science (Agricultural Economics) of Ahmadu Bello University, Zaria.

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DEDICATION

This work is dedicated to the memory of my beloved late sister, Mrs. Yetunde Janet Ayo. Her sisterly love and concern for my advancement will forever be remembered.

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ABSTRACT

There is no doubt that the overall objective of most agricultural policies and programmes in Nigeria since independence have been the development of a more efficient agricultural sector. However, policies, programmes and projects can only achieve targeted goals if they are consistent with the farmer's basic objectives of farm production.

This study examined the objective of small and large scale farmers in one of the major food crop production areas of Northern Nigeria. It also examined the farming systems, the enterprise combinations, as well as the constraints militating against the farmers in the study area. Statistical tools, net farm income analysis and the element ranking techniques of paired comparison were used in the analysis and the following major conclusions were made:

(1) More than 90 percent of farmers sampled have more than ten years of experience in farming. (2) The average number of persons per household was about ten, with women and children making up about 60 percent of this figure. (3) More than 95 percent of the farmers sampled practised mixed cropping, with maize and sorghum being the most important crops. (4) Over 76 percent of the farmers sampled were small scale holders. (5) Farming is a profitable venture in the study area.

Results from goals evaluation revealed that farmers in the study area have objective functions that are multiple and varied in nature. Also, that in planning his farm production, the small scale farmer combines the following objectives in the following order of preference:-

(a) Meeting his family food need - food security for the household.

(b) Minimizing borrowing of money for farm production

(c) Generating as large a surplus produce as possible

The goal of profit making is not considered a major objective for decision making among the small scale farmers. The large scale farmer on the other hand combines the following objectives in the following order of preference while planning his farm production:-

(a) Making profit from farm production.

(b) Generating as large a surplus produce as possible

(c) Limiting out-of-pocket cash expenses

The effects of decision making by the small scale farmers were very overwhelming on the overall result obtained when all the farmers i.e small and large scale were treated together for goals ranking. This is because small scale farmers are in majority; more than 76 percent of the respondents. What we have here could be a reflection of what is happening all over the country in terms of the proportion of small to large scale farmers.

It follows therefore that to make Nigeria reap the full benefit of her agricultural sector, small scale farmers must be encouraged to embrace production goals that are geared towards profit making. This they could do without conflicting with the goal of producing enough to meet their family food needs.

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CHAPTER ONE

INTRODUCTION

1.1 Role of Agriculture in the Nigerian Economy

Nigeria's economy is basically agricultural, with agricultural production in the hands of the small scale farmers. In spite of the growing importance of other sectors, the oil industry in particular, the agricultural sector occupies a very important position on the list of sectoral economic development. Adeoti (1984) observed that in terms of abundance of resources, the proportion of labour force, about 70 percent absorbed in agriculture and contribution to the Gross Domestic Product (G.D.P), which is currently about 20 percent, agriculture is regarded as the key factor in Nigeria's economic development programmes. The nation's agricultural policy during the past national development plans is indicative of the roles the agricultural sector plays in the development of the economy. As stipulated in the third National Development Plan (F.G.N., 1974), the agricultural sector is expected to contribute towards:-

(i) Providing adequate food for increasing population;

(ii) Creating rural employment opportunity to absorb more of the increasing labour force in the country;

(iii) Providing adequate raw materials to a growing industrial sector;

(iv) Expanding the production and processing of export crops with a view to increasing and further diversifying the country's foreign exchange earnings; and

(v) Providing a market for the products of the individual in the sector.

The agricultural sector up to the late 1960s was able to perform the general role of being the motivating force for economic development. According to Abalu and Ingawa (1987), agriculture contributed up to 70 percent of the total volume of national export in 1964. As equally reported by Adeoti (1984), about 80 percent of the economically active population of the country was engaged in farming in the early 1970s. One can see that there are far too many farmers in Nigeria when compared with developed countries where less than 4 percent of the population produce enough to adequately feed their people and with abundance surplus for export (Ogungbile and Olukosi, 1991). This is a correct observation given the fact that farm holdings in Nigeria have been observed to be less than 6 hectares per household (Olayide and Lele et al., (1989).

However, despite the high percentage of Nigerian population involved in agricultural production, the general trend in the agricultural sector has since late 1960s been characterised by declining productivity. Nigeria an exporter of food and agricultural raw materials has hitherto become an importer of these same items. The contribution of agriculture declined from 43.4% in 1966/67 to 31.6% in 1971/72 and increased marginally to less than 20% between 1980 and 1985 (Annual abstracts of statistics, 1985). Many reasons have been adduced for the continuous plumeted performance of agricultural contribution to

the national economy. Oluwasanmi and Alao (1995) contended that one of the factors that could lead to declining productivity in agriculture is the use of traditional techniques of production. The gross under-utilization of the available human and land resources has been thought of as another contributory factor towards the unimpressive performance of the agricultural sector (Aribisala, 1982; Awoyemi, 1986). In his own contribution, Idachaba (1984) centered his arguement around the absence of formal grassroots farm credit, improper approach to mechanization of agricultural systems, absence of complimentary price support, and the urban biased policy of government in the provision of social infrastructures as factors responsible for declining agricultural productivity and contribution to the national economy.

It is a well known fact the world over that for a country to be economically viable, such a country must have a strong agricultural base. It is in realization of this fact that an attempt towards achieving self-sufficiency in food and restoring the nation's pride of having a growing economy with little dependence on large scale foreign investment that various strategies and policy measures have been planned and implemented by successive governments in the past. Some of the most important strategies include the National Accelerated Food Production Programme (NAFPP) established in 1972; the Agricultural Development Project (ADPs) launched in 1972; the River Basin Development Authority (RBDA), established in 1974;

the Operation Feed the Nation (OFN), launched in 1976; the Green Revolution launched in 1979; National Directorate of Food Road and Rural Infrastructure (DFRRI), launched in 1986; and recently the National Agricultural Land Development Agency (NALDA).

With all these efforts made so far, it is pertinent to know that the production level of our farmers, majority of who are small scale holders have not changed over the years. These small scale farmers are perceived to have production goals that do not place much emphasis on profit making. (Olayide and Heady, 1982). These production goals must be understood if they are to be given a new orientation that will make them change their attitudes to profit oriented production. However, opinion is virtually unanimous in literature that small scale farmers, especially in developing countries rarely based their production or resource allocation on a single all encompasing objective (Patrick and Klienbestein, 1980; Fitzsimmous and Holmes, 1958). The objective function of small scale farmers is rather reasoned to be composed of multiple and often conflicting goals (Papendreon, 1952; Flinn et al., 1980). According to a study carried out by Ancey (1975) in parts of West Africa household heads emphasized food self-sufficiency, inter-annual security, leisure, prestige, cohesiveness, satisfaction of social consumption objective and land prerogative as the major determinants of their production decision while on the other hand, the other males in the household emphasized a certain contrasting set of goals which are market production, non-agricultural income, net monetary income

and autonomy as goals compatible with their aspirations.

Ferguson (1965) observed that although multiple objectives and lexicographic ordering are recognised, the analysis of small scale farmer's production behaviour has often been narrowed down to an identifiable operable objective such as profit maximization due to lack of operable models for multiple objectives considerations. However, recent development in the field of Mathematical Programming has provided ways in which multiple objectives considerations can be modelled and analysed (Cohon, 1978). It is therefore a worthwhile effort to attempt empirical determination of the primary objectives which govern the production decisions of various groups of farmers. This is very essential if sufficient understanding of the decision making process of the farmers is to be fully understood, moreso now that appropriate analytical models for handling multiple objectives have evolved. This work focuses on the investigation and determination of farmers production objective hierarchies structure in Maigana Zone of Kaduna State Agricultural Development Project.

1.2 Problem Statement and Justification

Inspite of the numerous efforts by successive governments, the performance of the agricultural sector cannot be said to be good enough to meet the aspirations of the various governments as spelt out in the national development plan. This apparent failure may not be unconnected with the fact that various efforts

made in the past and present to increase agricultural productivity has often pay little attention to the farmers, the environment in which they operate and their production goals and aspirations all which are the determinants of farmers production decision making process. Any development programme which does not take cognisance of the goals and production decision making process of the farmers can hardly make any meaningful impact. Since Nigerian agricultural production is mainly in the hands of the peasant farmers, the neglect of the production goals and decision making process of these farmers could be one of the major factors responsible for failure of the past efforts in addressing the problems of the agricultural sector. This study focuses on the empirical determination and evaluation of the farm production objectives/goals which govern the production decision of various groups of farmers in the study area. Since no attempt has been made to study the primary objectives which govern the prodcution decision of various groups of farmers in the northern part of the country as a whole, this study is timely. The knowledge of the objective structure of farm operators will provide analysts and policy makers a solid ground for profering more realistic solutions to the farm management problems of farmers. It may also serve as a pointer to why policies based on particular or assumed farm objective structure have failed in the past.

The following research questions raised will be critically addressed by this study:-

(a) What are the objectives/goals which motivate farmers in the study area to produce what they produce?

(b) How are the type of farming systems and enterprise combinations they engage in related to their goals or objectives?

(c) What are the constraints facing farmers in the study area?

1.3 Objectives of the Study

The purpose of this study is to examine the various objectives/goals which govern the production decisions of various groups of farmers in the study area. Specifically, the following objectives of the study are:

(i) to describe the farming systems and enterprise combinations in the study area;

(ii) to determine the various production objectives/goals which govern production decisions of farmers;

(iii) to rank the objectives/goals in order of importance to farmers' decision making process;

(iv) to compare goals ranking of small and large scale farmers in the area;

(v) to determine the net farm income of the farmers in the study area in relation to their goals/objectives;

(vi) to identify the constraints facing farmers in the study area;

(vii) to derive policy recommendations from the findings of the study.

1.4 Organisation of the Thesis

The remaining parts of the thesis are organised as follows:

Chapter II reviews the literature relevant to this study. The chapter comprises theoretical framework as well as empirical findings on measurement and evaluation of farm production objectives.

The methodology of the study is presented in Chapter III. The chapter commenced with a brief description of the study area. The sampling and data collection methods are discussed in this chapter which concludes with an explanation of the analytical techniques selected for the study.

The results and interpretation of findings are presented in Chapter IV and V. Chapter IV discusses farmers' household characteristics and farming systems while Chapter V discusses results on goals ranking among the farmers. Chapter VI summarises the findings of the study and also presents suggestions for further studies.

CHAPTER TWO

REVIEW OF LITERATURE

2.1 Introduction

Low-resource farmers like other decision makers are goal oriented in the sense that they manage the resources at their disposal in an attempt to achieve a set of desired goals. According to Flinn, Jayasuriya, and Knight (1980), most researchers who study farm management in peasant agriculture do, of course, recognise the low-resource farmers's multiplicity of goals and appreciate that they should be considered when evaluating the relevance of agricultural innovations. The more frequently identified goals of low-resource farmers according to them are:-

(a) to maintain the social position of the household to ensure that it remains entitled to the benefits of the society;

(b) to provide the household with a secure supply of staple foods over time;

(c) to provide the household with a secure source of cash for the purchase of priority goods and services not produced by it; and

(d) to accumulate a surplus to invest in the household, to purchase farm and non-farm assets, and to accumulate wealth.

While the importance of security - that is, lack of risk - has been intesively studied and reported by Roumasset et al., 1979; Baddes et al., 1979, less attention has been focused on explicitly incorporating other goals of farmers in management

in management models of their farming systems. Agricultural research networks in developing countries are becoming more aware of the need to evaluate technologies in a whole farm as opposed to in a partial context, and to recognise that the goals of a farmer, in addition to the constraints he faces, will influence the appropriateness of a technology to him (Zandstra, 1979).

However, the orthodox motive of enterprise is that of profit maximization. It is claimed that the concept of profit maximization operates on the assumption of how businesses ought to act if their decisions were optimal, and not how they reallly act (Olayide and Heady, 1982). The concept of goals of production is an important issue in the production process. It is therefore essential that a recent review of literature on this concept is made and to examine how mutually consistent or exclusive some of the new concepts and/or extension are in relation to the farmers. The approach will be to derive the relevant and consistent aspects of profit maximization and then discuss the various extensions of the goals of production that have been propounded in recent years.

2.2 Profit Maximization Goal of Production

Orthodox production economic theory begins with the assumption of the existence of pure competition, which rests on the atomicity of buyers and sellers, the freedom of entry and exit, and homogeneity of production from the sellers and buyers'

point of view. It is contended that the enterpreneur's motive for producing any given product is that of the attainment of maximum profit while the consumers or buyers' motive for purchasing is that of maximizing utility (Olayide and Heady, 1982). If we follow the works of Henderson and Quandt (1971), profit maximization can be derived mathematically as follows:-

Let us assume two factors and one product production function of the form

$$Q=f(X_1, X_2) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 1$$

If the cost equation is given by $C=r_1X_1+r_2X_2+b \quad \ldots\ldots 2$

Profit π is given by revenue PQ minus cost.

We therefore have $\pi=pf(X_1, X_2)-r_1X_1-r_2X_2-b \quad \ldots\ldots\ldots\ldots 3$

To maximize profit, we set partial derivatives of equation two with respect to X's equal to zero and solve. We thus have:-

$$\frac{\delta\pi}{\delta X_1}=pf_1-r_1=0 \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 4$$

$$\frac{\delta\pi}{\delta X_2}=pf_2-r_2=0 \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 5$$

$$pf_1=r_1;\ pf_2=r_2 \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 6$$

$$\frac{f_1'}{f_2}=\frac{r_1}{r_2} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 7$$

Equation 6 states that the value of the marginal product must be equal per unit input cost while 7 states that the ratio of the marginal productivities of the two inputs must equal per unit price ratio. These equations provide the necessary condition for the attainment of maximum profit.

2.3 Satisficing Goal of Production

There is another school of thought who attributed satisfaction as the motivating force propelling a producer to produce. Although single objective decision models, such as profit maximization and the expected utility model, have been successfully employed to predict behaviour at a macro or industry level, they have proved less satisfactory at the micro level as a predictor of an individual decision maker's behaviour (Patrick, 1981; Baumol, 1965).

Baumol (1965) for example, argues that we can no longer operate confortably on the assumption that profit maximization adequately explains all of the observed business behaviour. The expected utility hypothesis on the other hand cannot be considered valid on the basis of positive criteria; indeed, in computationally complex situation, the expected utility hypothesis predicts behaviour no better than mere chance (Kooten, Schoney and Hayward, 1986). Simon (1959) contended therefore that management recongnises in great majority of cases, either explicitly or implicitly the complexity of calculations of an imperfection of the data that must be employed in any assessment of optimality. This complexity leads them to set up for themselves some minimal standards of achievements considered hopefully capable of assuring the firm viability. He then suggests that decision makers strive to attain satisfactory levels of each objective instead of optimizing over a single objective. He termed this behaviour satisficing. Satisficing

behaviour occurs in part, because managers have limited information processing capabilities. Farmers are also hypothesized to be satisficers rather than profit or expected utility maximizers. There is also substantial evidence that decision-makers consider multiple objectives when they make choices. Patrick (1981) and Kliebenstein (1973) in their own contributions have observed that farmers do consider multiple goals in their decision-making and that individual farm family goals must be studied in order to really understand the management strategy engaged in by farmers. Thus in agriculture, the study of producers' goals has become an important area of investigation and hence instead of seeking to maximize profit, the viability of the agricultural firm, given an acceptable level of profit, will lead to the goal of "satisficing" rather than "maximizing" (Olayide and Heady, 1982).

In support of this framework, Cyert and March (1963) developed what they have termed a "behavioural" theory of the firm. This theory has attempted to demonstrate how firms really act as opposed to how they ought to act under optimal conditions which the maximum profit goal specifies. They contended that firms have organizational goals with organizational dimensions of which the organizational choice involves four sets of relations. These four relations are (i) quasi resolution of conflict (ii) avoidance of uncertainty, (iii) search for good alternatives simulated by ensuring problems (iv) a learning process continuously going on. It was their firm belief that all these

will determine the goals and consequently the production decisions taken by any production outfit.

2.4 Maximizing Utility Goal of Production

Utility maximization has been viewed as another important motivating force in production and decision making process. According to Scitovsky (1943), this concept of theory of the firm stems from the observation that the motive of enterprise of the farm-firm is definable in terms of the maximization of an ordinal index of utility, rather than profit maximization. Reder (1947) contended that management as a peak of firm's pyramidal power, behaves rationally with respect to a well defined ordering of preferences. This implies that it acts as if it attempts to maximize a multivariate preference function subject only to any limitations or constraints which inhibit effort (Encarnacion, 1964). Thus for example, the desire for leisure, the need for liquidity and control, the quest for profit, the search for power *et cetera*, are all incorporated in the generalized and constrained maximization problems.

Williams (1964) in expanding on the utility function theory claims that a manager can direct resources allocation in a firm to increase his own utility in three ways. Firstly, by obtaining higher profit for the owners of the firm in the usual maximum profit setting as a means of getting a higher salary. Second, in the belief that bigness is correlated with higher salaries, he will seek to get a higher salary at the expense of a decrease in

profit (holding profit constant as ceteris paribus) by striving more to enlarge the gross asset size of the firm. Third, he can sacrifice some increments to stockholders' profit in order to increase expenditures for his own non-prcuniary involvements within the firm. The extent to which these three avenues are used depends on the costs to the stockholders of detecting and policing the manager's behaviour and effectiveness or the cost of enforcing contracts. According to Olayide and Heady (1982), this third way is admissible if we employ a utility maximizing theory instead of a pecuniary wealth maximizing concept. Under such situation, we can interprete manager's behaviour according to them as a choice among opportunities to obtain increments in non-pecuniary goods in his utility function. They contended that non-pecuniary goods will include thick rugs, friendly colleagues, leisurely work load, status in society. Thus the utility maximizing theory is applicable if (a) we identify some of its components besides direct pecuniary wealth. (b) If we can identify circumstances that involve differences in the costs of each of various types of managerial non-pecuniary goods. In general, the advantage of utility index hypothesis is that, it puts the theory of the firm on an equal footing with the theory of consumer choice. In addition, it tends to remove some of the objections to the assumptions of traditional theory of a sufficient motive of profit maximization. In the revised theory, the business decision maker merely makes a choice from among the

set of all feasible alternatives which will put him on the highest indifference locus (Olayide and Heady, 1982). This seemingly useful improvement on profit maximization concept may have a largely illusory gain. This according to Olayide and Heady is due to the fact that, the utility theory itself seems to have greater generality and flexibility but is so elastic as to be incapable of producing meaningful and irrefutable hypothesis. Thus, the utility concept may be said to merely provide us with a more imposing and intringuing box, which upon further inspection turns out to be even more empty than the other so called extension of or modifications of the maximum profit goal.

2.5 Time Frame in Production Goals and Decision Making Process

Time frame is an important factor influencing farmers' goals and decision making processes. The time frame to which the household decision is keyed and to which the goals are applied may play a significant role in a household adopting or rejecting an improved agricultural technology. Norman, Hays and Simmons (1982) contended that while much has been made of the non-changing age old traditions of agriculturists in the savanna, they have observed considerable changes in Nigerian agriculture over eleven years. They said that some modifications in farming operations were in response to the expected climatic variations and demographic changes, but other adaptations made by "traditional" farmers were influenced by price, new seed availability, transport conditions and other factors. It is

apparent that farming households operate in a dynamic rather than a static situation. This implies that analysis is in a multi- rather than a single dimension setting with one critical dimension being time. Thus, the farming household today is a function of what happened in the past. According to Norman, Hays and Simmons (1982), historically, in India, for instance, oxen were used as draft animal in a settled farm sector. In the West African Savanna however, the management of livestock has been in the hands of normadic herding groups, and settled farmers did not rely on the power of animal for their operation. Only gradually through commercialization of agriculture, are draft oxen being introduced into West African agriculture.

Similarly, in the situation of extensive availability of cultivable land which has typified the savanna for centuries, there was no compelling reasons to develop sophisticated means to preserve soil fertility. According to Norman, Hays and Simmons (1982), occassionally fallows, animal manure applications, and certain method of tillage were considered adequate. With growing populations, however, increased intensification and permanently cultivated fields have become the rules rather than the exception. Shortened fallows are one sign of this trend. As Harwood (1979), noted elsewhere, farming households operating near the subsistence level are not likely to be able to forgo a portion of their current production potential as fallowing dictates for the chances of higher production in the future. The consequence of this is that the need to pursue a short term

private goal of survival could well necessitate sacrifice of a long-term private or societal goal of maintaining soil fertility (Norman, Hays and Simmons, 1982). Consequently, the chances of farming households succeeding in the long run may be reduced by the actions they need to take to survive in the short run.

2.6 Farmer Multiple Goals of Production

Farming households in the Savanna areas of West Africa are often described as being somewhere on the continuum between subsistence and fully commercialized agricultural production. While complete self-reliance on household resources and production is not the case, neither are household decisions completely tied to market factors. Additional complexities are introduced moreover when attention is focused on the decision-making situation within farming households.

As observed by Norman, Hays and Simmons ('1982), the traditional household farming organization in Northern Nigeria savanna was premised on a group of jointly cultivated fields and a certain number of private fields cultivated in their own time by adults within farming households. There appears to have been significant increase in the number of individual decision-makers within farming households, although the two levels of decision-making with regard to farming operations within the household have not yet disappeared. They further contended that where joint farming household persist, young men and sometimes young women, are often given partial autonomy in control over land and

other resources. As a result, the household head, who is likely to have a different goal from other individuals in the household who undertake production independently. Furthermore, households are still units within specific communities and the exogeneously determined values of social interdependence still apply. Consequently, any farming household may have a complex mixture of goals.

In addition to his fundamental needs for food, clothing and shelter, the small farmer has desires and needs determined by his culture. Thus according to Harwood (1979), ornamentation, entertainment, devotions to deity or deities may be included in the aspirations of even the poorest farm family. The satisfaction of such aspirations will be produced at home or purchased, depending on cost, availability, and other factors. In any event, they represent goals to which labour will be diverted. The satisfaction of such cultural needs and aspirations can become an important part of the small farmer's life despite the urgent need to attend to his vital survival needs. His farm production pattern is therefore often designed to secure these cultural values as well as food, clothing and shelter. Harwood further stated that for a farmer to meet his cultural goals, the farmer in an area of limited commercial opportunities may rely on his own capacity for domestic production. He emphasized that the size of the farmer's family may be expanded, at least quasi-purposefully, so that at least one daughter can be spared for agricultural pursuits to learn the

temple dances, a son can enter the monastery or go to school, or a relative who knows how to weave prayer mats be brought into the household.

We can therefore say that for the farmer to satisfy all his cultural goals in the commercial market place is clearly impossible and probably culturally undesirable. Most of the cultural needs will therefore be met at the expense of a certain amount of potential farm production. Any successful agricultural development programme must therefore come to terms with this non -commercial fact of life.

2.7 Lack of Suitable Conventional Analysis in Multiple Goals Measurement

There are however, severe problems in fitting the multiple goals of such households into the marginalist analytical framework conventionally used in investigating fully commercialized agriculture. Such a framework usually implies a single goal of profit (income) maximization. Yet, by itself, this type of analytical procedure is valid only when the welfare of farming households is maximized as a result of pursuing profit maximization, which is rarely true (Saint Coward, 1977; Valdes et al., 1979). According to Norman, Hays and Simmons (1982), the welfare or well being of farming households, in reality appears to consist of two major components, the tangible and the intangible. Part of the tangible component, for example,

production entering the market place can be directly measured by the market force. The household consumption can have a value imputed to it on the basis of market forces say, the price of buying an equivalent amount at the time of consumption or the price for which it could be sold at the farm gate. That the imputed value truely reflects the welfare obtained for a household placing a high value on a food self-sufficiency goal, however, can be debated (Idachaba, 1980). Even more debatable is the ability of the analyst to incorporate in a similar single measure an indication of household welfare with regard to the intangible content.

As emphasized by Castle (1977) an important part of the welfare of farming households in subsistence societies is manifested in their relationship with the communities in which they live. The social interdependence that exists has both costs, in terms of moral and cash obligations, and benefits, which are realized especially in times of adversity when a localized social security system comes into play. Increased economic independence resulting from rising external economic influences rarely always decrease social interdependence. While shadow prices can provide an analytical way of approaching social costs, it is rare for a factor such as decrease in social interdependence to be induced when examining welfare benefit (maximized utility) potentially associated with adoption of an improved technology (Norman, Hays and Simmons, 1982). Nevertheless, relationships within the community are important

and certainly do influence the goals of farming households and the farming systems they adopt. Harwood (1979), cites an example of a farmer obtaining high returns from a particular improved technology one year but not using it the next year because it had a deleterious effect on his relationships with other members of the communities.

2.8 Goals of Small Farm Development

Measurement of farmer's goals can serve a number of useful purposes. According to Kooten et al., (1986), some of these purposes are as follows: Firstly, the understanding of farmers' goals can be useful for predicting economic behaviour. Secondly, multiple goals can be incorporated into farm simulation models to assist producers in making decisions. Thirdly, knowledge of farmers' goals is desirable for the formulation of agricultural policies and programme.

Olayide and Heady (1982) asserted that peasant farming has certain basic features which distinguished it from commercial firms. Six of these distinguishing characteristics according to them are that, firstly, there is a relatively small area under cultivation. Second is the relatively large amount of labour applied per hectare of cultivated land. Third, is the relatively low investment in and expenditure on farm inputs as a whole. Fourth is the application of simple structures, crude tools and other labour demanding equipments. Fift is the strong resistance to change unless the new method is very well proven and hence

complete reliance on fool-proof socio-cultural practices handed down from one generation of cultivation to the other. Six is the relatively low yield per hectare or per animal or per labour input.

The most eloquent attempt to produce a theory of peasant production is that by Chayanov. Chayanov (1966) in his exposition contended that peasant economies are made up of family units in which the category of wages was absent and that this structure of enterprise should belong to a fundamentally different economic theory. Chayanov's central concept for analysing family economic was what he called the labour-consumer balance between the satisfaction of family needs, and the druggery or irksomeness of labour. He said that the peasant family would tend to put in greater efforts, if and only if they had reason to believe that such expenditures of extra labour would yield an increase in output which is required for greater family consumption or for enlargement of investment in the farm or both. In other words, each peasant family would try to roughly strike a balance or equilibrium between the degree of satisfaction of its needs and the degree of druggery of labour.

Harwood (1979) was very emphatical in saying that the fundamental goal of assuring enough food for the community and for the individual family is common to farmers in all rural societies. Beyond meeting the basic food needs, the goals of families and societies become individual and diverse. He further said that it is important to recognise at the outset that the

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success of small farm development often depends on just such a coincidence of individual and societal goals. Either the society becomes responsive to the personal goals of individual members or the individual is motivated to recognise the societal goals as his own.

It is fast becoming a truism among economic development specialists that farmers are utility "maximizers"; that they are making decisions that are in their best interest as they see them. It is often difficult however, to define and quantify the farmer's concept of utility. Whether utility is synonymous with profit in the traditional sense depends on the degree of which the particular farmer recognises and participates in commercial value. If we are to be of any relevance or use to the greater numbers of farmers outside the commercial sector, we must not depend too much on the profit motive (Harwood, 1979). As further stated by Harwood, the pursuit of non-commercial goals may lead the farmer to make certain choices for prestige value rather than for simple profit. He may hence decide to produce honey, butter, nuts or beer in lieu of more mundane staples. These items or any surplus production he contended can be traded for goods and services with the farmer's neighbours - the porter; the blacksmith, the tanner, or the herbalists. The farmer's non-commercial interest may also include such things as religious gifts, the creation of artifacts, home building and decoration, the accumulation of food and goods for dowries, and observance of birth, deaths, marriages, circumcisions, confirmations, and other

rituals.

However, the most difficult value for an observer to appreciate in the small farmers is stability. The farmer values insurance against famine, or crop failure. By the same token, he places a negative value on unecessary risks. What is sometimes described as the farmer's characteristic tendency to avoid extra exertion or commitments of resources is actually a reflex attempt to assure stability (Harwood 1979). The farmers' sense of security is enhanced by his choice of the known over the unknown and by his conservation of energy and resources. The tendency of the small farmer barely making a living under the best circumstances, to put an exceedingly high value on security and stability is a fact that must be appreciated by those who plan changes to improve the small farmer's conditions. That is one of the surest ways of moving the agricultural sector forward.

2.9 Empirical Determination of Farm Production Goals/Objectives

A number of goal measurement techniques have been employed in the literature. Two broad categories of these techniques exist, namely unidimensional and multidimensional goal preference evaluation techniques. The unidimensional techniques are based on the assumption that farmers evaluate the goals as a single continuum ranging from the undesirable to the highly desirable (Patrick and Blake, 1980). According to Aromolaran (1991), there are three classes of unidimensional goal measurement techniques

that have been used in literature. They are:-

(a) the paired comparison method.

(b) the magnitude estimation technique, and

(c) the fuzzy pairwise comparison technique.

Harman et al., (1972) Patrick and Blake (1980), Haper and Eastman (1980) and Durojaiye (1990) have all used the method of paired comparison in the measurement and evaluation of farmer's goals and in determination of the preference ordering of these goals. Moreso, Patric and Whitaker (1982) and Patrick (1983) have adopted the magnitude estimation method in the evaluation of farmers' goal preference. The magnitude estimation method is one out of a number of psychological ratio scale construction methods introduced by Stevens (1959), and it is the only one that has consistently been employed in the study of farmers' goals. Finally, the fuzzy pairwise comparison method was recently developed and used by Kooten et al., (1986) to establish ratio-scales for goal preference intensities. However, the major point of criticism of the unidimensional approaches in goal measurement has been that they do not explicitly recognise the fact that individual farmers or groups of farmers can be influenced in their goal ranking by time-value, space-value and group-related factors (Aromolaran, 1991). These influences when present would make the measurement of goals on a unidimensional-scale continuum result in defective evaluation of goal hierarchies (Gasson 1973 and Patrick, 1983).

Finally, various forms of multidimensional preference

scaling techniques have been develped and applied to the evaluation of goals and goal hierarchies of farmers. The major disadvantage of these multidimensional goal evaluation techniques is that they cannot be used to scale the goals of individual farmers as they can be used for a group of farmers (Kooten et al., 1986). However, paired comparison technique will be employed for the purpose of analysis in this study.

2.10 Multiple Goals in Planning Models

Attempt has been made to incorporate multiple goals into the farm planning model and this has resulted in many strategies devised to solve problems characterised by multiple objectives, or multiple decision criteria (Easton, 1973; Thanpapillai, 1978). A way in which the goals of management are frequently incorporated in planning models of peasant farms is to include these goals as vector in the constraints sets of linear programming (LP) models. Thus, for example, minimum levels of family consumption of farm produced goods and cash are entered as constraints which must be met before the objective of maximizing a surplus can be approached (McCarl, 1978 Barlow et al., 1979). However, Flinn, Jayasuriya and Knight (1980) identified the following as the potential limitations of the widely used approach: (a) the implicit assumption that all goals included in the constraint set are of equal importance to the decision maker, and that there is no trade off between the achievement of various goals; (b) the requirement for a feasible solution to the LP

model that all objectives (identified constraints) are compatible and can be satisfied. In reality, goals may be conflicting and, at the margin, goals are often flexible. Furthermore, it may not be possible to satisfy all goals, in which case the LP formulation is infeasible.

Charnes and Cooper (1961) devised a procedure to incorporate multiple objectives within an LP framework. Their approach involves use of positive and negative deviation variables that add to or subtract from constraints to remove the infeasibilities. The optimal solutions is the one which minimises the sum of the deviations (which may be weighted to reflect rates of substitution between goals). This particular LP structure was used by Barnett (1979) to solve a multiple goals decision model of a low-resource farm household. The Charnes and Cooper specification of the multiple goal problem is appropriate when all goals are of the same level of priority. The concept of pre-emptive priorities, that is lexicographic ordering of goals, was introduced into programming by Ijeri (1965).

In Ijeri's model, goals are grouped into various priority levels. The modifications of the simplex method necessary to solve 'priority' linear goal programming model (LPG) have been described by Lee (1972) and Ignizio (1976). LGP has been applied to problems of macro planning (Charnes et al., 1976), business management (Goodman, 1974), and Geography (McGrew, 1975). However, the technique does not seem to have been applied to problems of resource allocation in agriculture, particularly

peasant agriculture.

According to Flinn et al., (1980), a limitation of LPG is the monotonic ordering of goals, with no facility for a trade-off between goals of different ranks. Nonetheless, goal ordering has proved a useful approximation in empirical decision models. Further users of LP are also implicitly accepting lexicographic ordering of goals in the sense that the first priority goals (of equal rank) are embeded in the constraint set as 'absolute' objectives which must be realized before any attempt is made to satisfy the lower level (non absolute) goals i.e. the LP objective function.

2.11 Process of Decision Making

Decision making is a function of goals or objectives that the individual is pursuing. There are various stages involved in decision making process. According to Rae (1977), there are at least six stages in the decision making process. First, a decision problem will exist only if the manager is not completely satisfied with the result of his present operation. For example, is he earning "too little" or working "too hard"? Given the presence of imcomplete satisfaction, the problem must be defined. Having done that, the third step involves the specification of possible ways of overcoming the problem or alternative must be evaluated in terms of the improvements in goals likely to be achieved through its implementation. Then, the best alternative

can be isolated and put into operation. Lastly, the manager must realize that a course of action may not turn out precisely as planned. He must therefore be prepared to accept the consequences of his actions. Each individual manager will have certain goals that he strives to achieve and he engages in agricultural production for this purpose. Such goals might be to make as much profit as possible, to do as little work as possible, to run the best farm in the district or some combination of these goals. Rae further said that management advisers should not choose to dictate what a man's goal should be, although he can always refuse to provide assistance to managers whose goals might be illegal or immoral. Instead, he should realize that the national manager will attempt, within the restraints of his available resources, knowledge and opportunities, to achieve his goals as well as possible. Agricultural management should be directed towards this end.

Gasson (1973) reported a study that attempted to answer the question "what motivates the farmers?" At least a partial answer to this question is required by the extension worker if he hopes to induce a manager to change aspects of his farming programme. It will also correct the error of a manager making a wrong decision because he was ignorant of better alternatives. The extension worker might be in error with his recommendations if he is unaware of the farmer's goals and values. Gasson therefore defines goals as ends or states in which the individual desires to be or things he wishes to accomplish.

In contrast to goals, values are permanent property of the individual, less likely to undergo change with time and circumstances. Values are individual's conception of the desirable and as such serve as standard influencing his goals and therefore his choice among alternative courses of action.

Finally, Gasson (1973) places values that farmer might hold into the following four groups:-

(1) Intrinsic value - those that consider farming as an activity in its own right, such as 'work enjoyment', 'independence,' and 'outdoor activity'.

(2) Expressive value - those that consider farming as a means of personal fulfilment, such as 'pride of ownership', 'self respect', and 'meeting challenges'.

(3) Instrumental values - those that view farming as means of 'obtaining a satisfactory income' and

(4) Social value - those that concern interpersonal relationship, such as 'belonging to a real community'.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 The Study Area

The data for this research work were collected from agro-economic survey farms in the Maigana zone of Kaduna State Agricultural Development Project. The villages selected for the research were Maigana, Tundun Tseibu and Yankassai all in the newly created Soba Local Government Area of Kaduna State. They are all located on the tarmac road from Zaria to Jos and are about 25 kilometres South East of Zaria.

It was assumed that the proximity to the project areas would have made farmers in the area accustomed to field surveys and therefore to willingly submit themselves as respondents. This zone is also close to the Ahmadu Bello University, Zaria, thus minimizing transportation expenses to the researcher.

3.2 The Climate and Ecology of Maigana Zone

The field survey in Maigana was conducted mainly in and around Maigana headquarters of the zone.

The soil of the area is ferruginous Tropical type on sandy parent material and crystalline acid rock. There are considerable variations in the rainfall pattern of the area. The amount of rainfall ranges between 700 - 1000mm per annum. This is fairly distributed over a period of 3 - 4 months in a year. Each year has two seasons (i) the rainy season which starts around May, and ends in September, and (ii) the dry season that

lasts much longer for about 7 months compared to 5 months of rain. It starts in October and ends in April (Kowal and Kassam, 1987). However, the area is within the Northern Guinea Savanna vegetation cover and has the mean temperature of about 75.98°F

Maigana consists of both upland (tudu) and lowland (fadama) land types. The lowland is situated along the river basins and is capable of supporting crops throughout the year. The upland on the other hand is cultivated mainly during rainy season (Aku, 1991).

3.3 Economy and People of Maigana Zone

Farming is the main occupation of the people in this area. In response to the variability and distribution of rainfall in this zone, the people have evolve a unique farming system characterised by mixed cropping. It is a cultural practice that takes care of risks and uncertainty in farming.

Crop production is still manually done on small scattered pieces of land using crude implements such as hoes, cutlasses, knives and axes. Increasing modernization of farming practices appear to have led to the adoption of biological (hybrid seeds) and chemical (fertilizers) techniques. Tractor ploughing is visible along access roads and is undertaken mainly by a few medium and large scale farmers. There is a farm service centre located in Maigana responsible for supplying farmers in the zone with farm inputs at government subsidized rates. The major farm inputs include improved seeds, fertilizer, pesticides, herbicides

and tractor services.

The main crops grown in the area are millet, sorghum, maize, rice and yam. The following cash crops are also produced: cotton, tobacco, groundnut, sugar cane and pepper. There is at the moment a tobacco production scheme set up by the Nigeria Tobacco Company (N.T.C.) Zaria in the area to help the local farmers improve on their tobacco growing practices.

The main ethnic groups in Maigana are Hausa and Fulani. The Hausa people are settled cultivators while the Fulani people are mainly cattle-rearers. Because of the practice of 'Purdah' among the Hausa Muslims, farming has become almost an exclusive preserve of men in the area. Within their confined environment, the Hausa women process food. The Fulani women sell the animal by-products (milk and butter). They use the money realized to purchase grains for family consupmtion.

3.4 Data Collection

Data were collected for this study through field survey. Well structured personal interview schedules were conducted with the help of trained enumerators. Eighty-five farmers were selected randomly from the list of farmers provided by the village heads in the three villages. On our arrival in the villages, we met the village heads who provided us with the list of one hundred farmers each. On the whole we had three hundred farmers from the three villages from which eighty-five were selected randomly. The purpose of random sampling in social

research is to avoid bias because it gives every member in the study area an equal opportunity to be selected through balloting.

3.4.1 Procedure for Data Collection on Multiple Objectives/Goals

A preliminary survey was carried out through personal interaction with the farmers in the study area between April and May, 1995. This preliminary investigation informed the listing of the final objectives/goals that appear on the interview schedule. The final survey was conducted in January, 1996. This coincided with the end of the harvesting period to ensure that the production information was still fresh in the minds of the farmers.

The farmers were asked to list the objectives or goals which govern their production decision making process. Thereafter, scheduled interview through structured questionnaires were conducted. The farmers were asked to rank each pair of the objectives listed during the preliminary interview in order of importance to them.

3.5 Analytical Tools

Simple statistical tools such as means, percentages, variance, standard deviation *et cetera*, were used to analyse farmers' personal characteristics such as age distribution, years of experience in farming, family composition, educational level,

farmer's resource base, size of farmers' land holding, cropping pattern *et cetera*.

3.5.2 Paired Comparison Technique

Paired comparison technique was used to develop the ranking of goal hierarchy for the farmers in the study area. This method has been used by Edward, Bradley, Rand Terry (1952) and Patrick and Blake (1980). The assumptions of the paired comparison model used by this analysis are those of the model formulated by Mosteller (1951a). However, the simplified version developed later by Eastman and Urquhart was adopted.

3.5.2.1 Goal Selection

The method of paired comparison requires that the respondents be presented with a list of all possible pairs of goals within the given set and that the respondents select the preferred goal in each pair. The number for a given set is equal to:-

Number of pairs = $n\,(n-1)\,/2$ or $C^{n}_{r} = \dfrac{n!}{r!\,(n-r)!}$

Where in both cases, n is the number of items in the set i.e. number of goals and in the second case, r represents a pair of objectives, so $r = 2$.

For example, in this study, we have nine goals slated for ranking. Therefore, the number of pairs

$$C = n(n-1)/2 = 9(9-1)/2 = \frac{72}{2} = 36$$

$$\text{OR } C^{1}_{r} = \frac{n!}{r!(n-r)!} = \frac{9!}{2!(9-2)!} = \frac{72}{2} = 36$$

i.e we have 36 pairs of Objectives/Goals. The difference between the total scores of any two of the n objectives will be tested for statistical significance through the least significance difference (LSD) statistical criterion.

$$LSD = t\ \alpha\ [(B(n)\ (n+1)/6]^{1/2}$$

Where t = the t value at α-leve of significance

n = number of goals or objectives

B = number of farmers.

However the simplified version developed by Urquhart and Eastman (1978) was the one adopted. This version at 0.05 level of significance is $LSD = 1.96[(B(n)\ (n+1)/6]^{1/2}$.

After the least significance test has been determined, ordinal ranks is assigned to each of the n objectives/goals on the basis of LSD test.

3.5.2.2 Limitation of this Approach

The most probable violations of the model and therefore, potential criticisms according to Harper and Eastman (1980) are contigent lack of normality in the sample and then the failure of the population to have equal standard deviations. However, Mosteller (1951b) has indicated that normality is not essential

for the application of the method of paired comparison technique, being more in the nature of a computational device.

Another problem is one in which farmers are presented with 36 pairs from which they are to choose from each pair which one they prefer. It requires a lot of effort and time to get the farmers to make their choice.

3.5.3 Net Farm Income Analysis

The net farm income analysis enables us to determine total revenue and total costs for one farm production (Olayemi, 1971). The difference between the total revenues and total cost is known as Net Farm Income (NFI). The equation developed for obtaining the net farm income was:-

NFI = TR - Vc - Fc

Where:

NFI = Net Farm Income in Naira.

TR/GR = Total or Gross Revenue in Naira

TVC = Total Variable Costs in Naira.

TFC = Total Fixed Costs in Naira.

The technique examines the costs, returns and the profitability of a farm enterprise. Total or Gross Revenue is a measure of the value of total production of the farm enterprise. It measures the total value of output from all the resources used in the production process. Total cost on the other hand measures the value of all inputs used in the production process. They are

made up of fixed and variable costs. The fixed costs include fixed cash expenses on repairs, maintenance, interest payments on medium and long-term loans, depreciation allowance of farm tools and equipment. The variable costs vary more or less with the level of production. They represent costs associated with farm operation. They are costs for items such as seeds, fertilizer, hired labour, sacks, baskets, interest payment on short-term loan and so on.

3.5.3.1 Limitation of Net Farm Income Analysis

(i) Net Farm Income Analysis are usually constructed from average input/output relationships. As observed by Hardaker and Dillon (1980) average obscure wide variations in soils characteristics, managerial ability, class differences, access to inputs and other variables which can influence the returns to any enterprise.

(ii) Cross-sectional data for net farm income analysis has been criticised on the ground that the data take no account of changes over time and space. Variables such as inflation, exchange rates, changes in relative prices and output, and the returns to labour are generally not comparable in different years. The vagaries of weather and climatic conditions can greatly influence output and consequently the returns to inputs in a given year.

(iii) There is no standard approach to net farm income analysis.

There is therefore a problem of deciding what items to include in net farm income analysis. Many studies have only included yields of main crops and left out secondary crops and non- farm activities.

(iv) Subsistence farmers purchase little or no farm inputs and retain a substantial part of their outputs for home consumption. Under such a condition, returns are highly dependent on the value researchers assign to inputs and output.

(v) The farm income analysis is unable to define optimum returns to enterprises. It simply uses the technical output obtained as well as the monetary cost and returns from a production process. Despite all these limitations, net farm income analysis is a valuable tool of analysis and relatively easy to use.

CHAPTER FOUR

PERSONAL CHARACTERISTICS OF RESPONDENTS

This section briefly describes some of the characteristics of the 85 farmers sample in the study area.

4.1. Age Structure of Respondents

The estimate as shown in Table 4.0 indicates that only 8.2 percent of the farmers sampled are below 30 years of age. This is more or less confirming the countrywide phenomenon of younger people showing less interest in farming and taking up what they considered to be more lucratice urban office jobs. About 32 percent are between the age of 31 and 40 years while 35.3 percent are between 41 - 50 years of age. On the whole, 67 percent of the total farmers are between 30 - 50 years of age. This group of farmer is considered to be most experienced and consequently most productive.

The result from the table also shows that 21 percent of the respondents are between 51 - 60 years of age while 3.5 percent are between 61 - 70 years of age. These groups of farmers are very experienced in the traditional mixed cropping systems practised in the study area but because of their old age, they are very few.

Table 4.0: Age Structure of Respondents in Maigana Zone of Kaduna State Agricultural Development Project

Age Group	No. of Farmer	% of Total	Mean Age for the Group
< 30	7	8.24	29.00
31 - 40	27	31.76	35.89
41 - 50	30	35.29	43.91
51 - 60	18	21.18	55.87
61 - 70	3	3.53	68.33
Total	85.00	100.00	43.67

Source: Survey data 1996.

4.1.1 Respondents' Years of Experience in Farming

As shown in Table 4.1, only 9 percent of the farmers have less than 10 years of experience in farming. The farmers in this groups have the mean experience of 6.75 years. The result also shows that about 37 percent of the farmers have between 11 and 20 years of experience in farming and the farmers in this group have the mean experience of 18 years while 28 percent of the farmers have between 21 and 30 years of experience in farming with about 28 years means of experience in farming. Finally, about 25 percent of the farmers have more than 30 years of experience in farming. The result shows that about 90 percent of the total farmers sampled are very experienced in the systems of agriculture in practice in the study area. They are therefore aware of the consequences of their actions and production decisions which will in effect determine their production goals.

Table 4.1: Years of Experience in Farming of Respondents in Maigana Zone of ADP.

Range of Years	No. of Farmers	% of Total	Group Mean of Years
1 - 10	8	9.41	6.75
11 - 20	32	37.65	18.03
21 - 30	24	28.23	27.92
< 31	21	24.71	41.71
Total	85	100.00	25.61

Source: Survey data, 1996.

4.1.2 Composition and Size of Household

Family composition is an important variable in agricultural production because:

(i) the available working force is obtained from it;

(ii) the size of farm-land is sometimes related to it, and

(iii) it is an important factor when considering the amount of food, the level of experience and the susceptibility to adoption of innovations.

Table 4.2 shows that the average number of persons per household in the study area was about 11. Out of this figure, 49 percent are children below 14 years of age considered too young to work on the farm in developed economy, but they participate in farm work in Nigeria setting. The remaining shows that adult women are about 26 percent of the total household member while adult men are about 25 percent of the total number of household member. On the whole, the working population is about half of

the total population of the youth that are below working age. This has a very serious implication in terms of what proportion of the total produce that will go into family consumption since those that are not producing will still have to be fed. This may be one of the reasons why many small scale farmers may have little or nothing to sell at the end of their yearly production. As such, they are more favourably disposed to production goals that will ensure enough food to feed their large family than making profit from their production.

Table 4.2: Composition and Size of Household for Respondents in Maigana Zone of ADP

Ranges of Age	Average Number of Persons per Age Group	Percentage of Total
Children < 14	5.28	49.48
Adult female > 15	2.72	25.49
Adult male > 15	2.67	25.03
Total	10.67	100.00

Source: Survey data, 1996.

4.1.3 Farmers' Educational Level

The distribution of farmers among educational levels shows that more than 63 percent of the farmers have less than primary education. More than 16 percent of the farmers have primary education while about 13 percent have secondary and 7 percent have tertiary educational level. The level of education attained is an important attribute of an individual. This will determine

the ability of a particular farmer to easily accept and adopt innovations that can bring about increase in production or reduction in production costs. It will equally affect the quality of decision making process and consequently the goal being pursued by the individual farmers. The goals being pursued by the farmers to a great extent influence their scale of production. In the study area, the farmers are generally small holders and their level of education and consequently goal being pursued must have influenced considerably their scale of production. In order to therefore improve the quality of their decision- making, the small scale farmers must be encouraged to acquire education through adult literacy programme which must be strengthened in the area. The importance of the extension workers in this regards must be properly harnessed to improve the literacy levels of the farmers.

Table 4.3: Educational Level of Farmers Sampled in Maigana of KADP

Educational Level	Number of Farmers	% of Total
None	14	16.47
Adult	40	47.06
Primary	14	16.47
Secondary	11	12.94
Tertiary	6	7.06
Total	85	100.00

Source: Survey data, 1996.

Description of Farming Systems in the Study Area

This section gives a brief description of farming and cropping systems operational in the study area.

4.2.1 Farming Systems

The study area covers Yankassai, Tudun Tseibu and Maigana all in the Maigana zone of Kaduna State Agricultural Development Project (KADP). The three villages are located South East of Zaria along Jos tarmac road. The system of cultivation by the people is mainly manually operated implements especially hoes, cutlasses and ox-drawn implements. The use of heavy equipment in the farms is rare and restricted to only a few large scale farmers who do hire tractors for operations such as ploughing and ridging.

4.2.2 Major Crops of Importance in Study Area

The study area is located in the northern quinea savanna ecological zone making it suitable for the production of cereals and legumes grains. Apart from cereals and legumes, other crops that are produced in this area in lesser quantity are yam, cassava, tomatoes, pepper, okro, groundnut, and potatoes. Cotton and sugar cane are produced as cash crops by few farmers in the area.

Table 4.4 shows the order of popularity of crops grown in the study area. Out of 85 randomly selected farmers in the area, 93 percent cultivated maize in 1995 cropping season while 88

percent cultivated sorghum. This shows that maize and sorghum were the most important crops in the area. This may not be unconnected with the rising importance of these crops as industrial raw materials due to embargo placed on importation of grains such as wheat and barley hitherto used by some indigenous flour mills and breweries. Maize and sorghum have therefore replaced those grains formerly imported for industrial uses and as such their roles are changing from being purely food crops to industrial and food crops. This has encouraged increase in their production by farmers since they are sure of ready market for whatever quantities they produced.

About 33 percent of the respondents produced rice in 1995. The renewed drive by many farmers these days to produce rice is due to high import duty placed on imported rice making their prices too high, almost double those produced locally and as such, many people prefer to buy local rice considered to be more nutritious. As a result of this, there is ready made market for locally produced rice. Even though cotton is a very important cash crop, only about 9 percent of the respondents produced cotton probably due to instability in its market price, high input costs resulting in low revenue to the growers in recent years. Almost all the respondents practised mixed cropping.

Table 4.4: Crops Produced in Order of Importance by Respondents in Maigana Zone of KADP

Crops	Number of Farmers	Percentage
Maize	79	92.3
Sorghum	75	88.2
Rice	28	32.9
Millet	25	29.4
Cowpea	23	27.0
Cotton	8	9.4
Soya bean	2	2.4
Pepper	2	2.4

Source: Survey data, 1995.

4.2.4 Rationale for Mixed Cropping

Table 4.5 explicitly outlined the reasons given by the farmers for growing their crops in mixtures.

About 95 percent of the respondents grew their crops in mixture while only 5 percent adopted sole cropping. The reasons given by the farmers for practising mixed cropping are presented in Table 4.5.

Out of 81 farmers practising mixed cropping, 30 percent gave prevention of crop failure and varieties of crops for household food security as reason for practising mixed cropping. This is consistent with the result in the goal ranking section. It is also consistent with the dominant nature of food crops among the eight major crops grown in the study area. With reference to Table 4.4, only cotton and pepper are predominantly cash crops

while all other crops are food crops consumed by the households. According to Norman (1970), subsistence oriented farmers will adopt a security or minimising maximum loss and maximizing minimum profit strategy while a completely market oriented farmer will adopt a profit mamimization goal. The farmer's goal implies diversification in production while the latter often implies specialization. In the survey area, farmers consume some of their farm products in the home but also sell some in the market. Consequently, they fall somewhere between the two extremes delineated above. However, the orientation towards market production has not changed seriously the security consciousness of the farmers in the study area as will be shown later under goal ranking.

Another reason given by the farmers for practising mixed cropping was to obtain total higher output. Out of the farmers practising mixed cropping, about 21 percent gave this reason. Higher output is consistent with the goal of profit maximization which is equally becoming important among the farmers in the area. About 56 percent of the farmer total production were sold leaving 44 percent for consumption by households.

Another reason given was the adherent to the age-long tradition of growing crops in mixture in the area and about 17 percent of the famer gave that reason. Tradition is an important value difficult to part with. Consequently,it is difficult to visualise farmers being persuaded to change to growing crops in sole stand. Indeed, this highlights one of the fundamental

problems of extension workers. Until the extension workers are able to suggest changes that have convincing returns and yet do not involve big changes in farming methods, it is unlikely they will ever be effective in their work. Farmers will readily adopt innovations that do not conflict too much with their age-long traditional outlook, e.g improvement of returns from his inter-cropping practices. Moreover, many empirical studies such as Grimes (1962); Evans (1960)' Anthony and Wilomt (1957) and Webster and Wilson (1966) have for example, shown that although the yield of some crops in mixture were decreased compared with their yield as sole crops,this decrease was offset by the yields of other crops so that inter-cropping gave higher cash returns per hectare than pure stands. Hence, the conclusion drawn by Evans in his study was that "unless sound evidence is obtained that production from pure stand is appreciably higher than that from mixed cropping and that there are advantages such as reduced labour input, pest and disease control,and convenience, it will not be possible to introduce rotational systems of agriculture based on pure stands as long as the hoe remains the most important agricultural implement". His assertion has been found to be very correct. This is because up till the present moment, hoe still remains the dominant agricultural implement in the study area because over the years, the skyrocketing costs and untimely availability of inputs have confined the farmers to the use of locally available traditional inputs.

Land due to population pressure is a limiting production

factor and as such, about 13 percent of the farmer gave maximization of available land as the reason for practising mixed cropping.

Other reasons given by the farmers are to increase soil fertility since they have come to realise that some legumes have the capacity to increase soil fertility when inter-cropped with other crops. Finally, 7 percent of the farmers gave protection of soil as their reason for practising mixed cropping since mixed cropping increase the overrall plant population and thereby prevents erosion due to excessive run-off during heavy down pour of rainfall.

Table 4.5: Reasons Given by 81 farmers in Maigana zone of KADP for Growing Crops in Mixture

	Reason by Farmers	Number of Farms	% of Total
1.	Traditionally it is the way to grow	14	17.28
2.	To obtain higher total output	17	20.99
3.	To maximize use of available land	11	13.36
4.	Prevent crop failure and for varieties of crops for household use - security	25	30.20
5.	Increase soil fertility	9	11.11
6.	Protect soil from erosion	5	7.06
	Total	81.00	1000.00

Source: Survey data, 1996.

4.2.5: Crop Combinations in the Study Area

Table 4.6 shows the various crop combination in the study area. From the total number of farmers, about 25 percent grew maize and sorghum in mixtures while about 12 percent grew maize, sorghum and rice in mixtures. Also, 8 percent grew maize, sorghum, millet and rice in mixtures.

Out of 21 crop combinations in the area, maize featured in 17 while sorghum featured in 15 crop combinations. This further confirmed the important position of these crops among the farmers in the area. Cowpea featured in 9 crop combinations and may well be consistant with the belief by some farmers that it helps to increase soil fertility. Apart from frequency of occurence in combination by these three crops, the area of land devoted to their cultivation compared with other crops also confirmed their relative importance to other crops in the study area. Besides, these three crops are becoming important cash crops for the farmers in the study area. The last column in Table 4.6 shows the area of land devoted to each of the crop combinations.

Table 4.6: Different Crop Combinations Adopted by Respondents in Maigana zone of KADP.

Crop Combination	No. of Farmers	% of Total	Area of Land Devoted (ha)
Maize	4	4.71	13.50
MZ/SG	21	24.71	100.60
MZ/SG/ML	12	14.12	40.80
MZ/SG/RC	10	11.76	47.70
MZ/SG/CP	7	8.24	35.05
MZ/SG/ML/RC	6	7.06	40.00
MZ/CP	5	5.88	15.80
MZ/ctt	3	2.35	4.00
MZ/SG/ctt	2	2.35	4.50
MZ/SG/ML/ctt	2	2.35	5.5
MZ/SG/ML/CP	2	2.35	5.0
MZ/ML/RC	2	1.18	3.75
SG/CP/RC/ctt	1	1.18	1.80
MZ/SG/SB/pep	1	1.18	1.50
SG/ML/CP	1	1.18	2.50
MZ/SG/ML/CP/ RC	1	1.18	0.80
MZ/ML/CP/SB/ ctt	1	1.18	1.25
SG/ML/CR	1	1.18	2.50
MZ/ML/CR	1	1.18	0.50
MZ/CP/RC	1	1.18	0.70
MZ/SG/RC/pep	1	1.18	0.50
Total	85.00	100.00	239.25

Source: Survey data, 1996

Note MZ = Maize, SG = Sorghum,
ML = Milliet Pep = Pepper
RC = Rice, CP = Cowpea,
SB = Soyabean Ctt = Cotton,

4.3.0: Farmers' Resource Base

4.3.1 Types of Land Ownership

Table 4.7 shows five forms of land tenure systems in the study area.

The land tenure decree of 1984 notwithstanding, the most obvious and prominent of the five systems of ownership is the existence of a communal monopoly. About 38 percent of the respondents in the study area acquired their land by inheritance. By this, land are passed from generation to generation and it leads to land fragementation since whatever land is left behind has to be shared among male children. The fragmentation of land renders the fragments uneconomical to use for commercially mechanized agriculture.

On the other hand, about 33 percent of the respondents acquired their farm land through outright purchase either from the village head or the prominent family head in consulatation with other familly member and the village head. About 18 percent of the respondents also acquired their farm land through payment of annual rent. People who have more than they can culttivate do rent their excess land to others who are either strangers or people who do not have land. About 8 and 4 percent acquired their farmland through lease hold and gift respectivelly.

Table 4.7: Land Ownership/Acquisition Methods by Respondents Sampled in Maigana Zone of KADP

Type of Ownweship	Number of Farmers	Percentage of Total
Family/inheritance	32	37.65
Purchase	28	32.94
Rent	15	17.66
Lease hold	7	8.23
Gift	3	3.52
Total	85.00	100.00

Source: Survey data, 1996.

4.3.2 Farm Size in the Study Area

Agricultural economists are very much interested in the question of farm size because farms in the smaller size group are not large enough for any meaningful investment in farm machinery and improvements.

Farmers in the study area are generally small holders with more than 80 percent of them with farms less than 5 hectares. About 27 percent of the respondents have average farm size of about 2ha (Table 4.8). On the other hand, about 14 percent of the respondents have an average farm size of about 4.75ha while about 6 percent have an average farm size of about 8.6ha. All these added together as shown in Table 4.8 shows that more than 90 percent of the farmers in the study area are small scale farmers. This is consistent with the classification by Olayide (1980) which puts farms with 10ha and above as big farms. Farmers that can therefore be regarded as big farmers in the area

are 4.7 percent.Small scale farmers production goals/objectives are said to be multiple and varied. They are also know to place more emphasis on other goals other than profit maximization. This will be shown by analysis in the last section of this work.

Table 4.8: Size of Farmers' Land Holding Among Respondent in Maigana Zone of KADP

Farm Size in ha.	Number of Farmers	% of total	Average Size of Holding
< 1.5	23	27.06	0.9
1.6 - 4.5	41	2.51	2.51
4.6 - 7.5	12	14.12	4.75
7.6 - 10.5	5	5.88	8.6
10.6-13.5	2	2.35	12
> 13.6	2	2.35	32.75
Total	85	100.00	

Source: Survey data, 1996.

4.3.3 Labour Use in the Study Area

Labour is a very important factor of production especially in traditional agriculture. In the study area, out of the total of 317, 437.38 man-hours of labour used by all farmers sampled, about 61 percent were family labour while 39 percent was hired labour. More of family labour was used than hired labour in the study area. This is consistent with similar study by Aku (1991) and it is the characteristic nature of small scale holders who constitute the majority of the sampled farmers.

Also about 59 percent of labour used per family was contributed by the family members while the remaining 41 percent

was hired labour. Moreso, labour used per hectare in the area was 964.13 man-hours. About 36 percent of this was hired labour while the remaining 64 percent was contributed by the family labour.

Table 4.9: Total Labour in Man-hour Contributed by Differnet Categories of Labour Type to Farm Operation Among the Respondents in Maigana Zone of KADP

Type of Labour	Man-hour contributed	% of Total	Labour Input per Family	% of Total	Labour use per ha.	% of Total
Hired	122848.27	38.70	1523.70	40.80	343.36	35.6
Family	194589.11	61.30	2210.86	59.20	620.76	64.38
Total	317437.38	100.00	3734	100.00	964.13	100.00

Source: Survey data, 1996.

4.4 Costs and Returns Analysis

This section is necessary to enable us know whether the farmers are able to break even and why they are still remaining in farming activity. As will be seen later, profit making consideration is not the least in the priority ranking when the production goals/objectives of small scale farmers and the totally of all the farmers sampled were considered. The profitability of any business activity can be inferred from the costs and returns relationships of that business. Higher returns than cost mean that a profit is realized and this could be reinvested or saved depending on the desire of the person concerned.

The cost incured by any business depends to a certain extent, on the type of inputs employed, the way the inputs are mixed in the production process and the extent to which they are employed. The revenue on the other hand stems from the nature of the gross returns which in themselves are largely determined by the input and the output-mix.

4.4.1 Farm Production Costs in the Study Area

Table 4.10 shows the cost components of farm production in the study area. The costs are subidived into variable and fixed costs components.

Variable costs are those costs that vary with the scale of production. They are expended on inputs that are used up in the course of producton process. They are costs items like seed, fertilizers, chemicals, labour etc. On the other hand, fixed costs are costs expended on inputs that are not used up in the course of one production process. They are cost on items such as cultlasses, hoes, machinery, implements, farm house and fence etc.

As shown in Table 4.10, out of N17,980.42 invested per hectare of farm production in the study area, N17,495.95 representing about 97 percent were invested on variable inputs. The dominant cost component was labour. Family and hired labour accounted for about 64 percent of the total costs. Without consideration for family labour, hired labour accounted for about 39 percent of the total costs while on taking family labour into

consideration, hired labour accounted for about 23 percent of the total costs of production. Family labour on the other hand accounted for about 41 percent of the total costs of production. The predominance of family labour could be due to the nearness of most of the farms to the house and small scale farmers all over the country due to their small farm sizes and the fact that they utilize large percentage of their products at home most of the time rely on their family labour for farm production.

Fertilizer alone accounted for about 35 percent when family labour was not taken into consideration and about 20 percent when family labour was considered. This is due to unavailability of fertilizer at official price and farmers therefore have to rely on fertilizers from open markets. Even then farmers were using about 409.39kg per hectare which is far below the recommended dosage of 800kg/ha of N.P.K. by I.A.R. for maize, 667kg/ha of same brand for rice but about sufficient for sorghum which requires 427kg/ha of N.P.K. for sorghum and 400kg/ha of N.P.K. for millet.

However, fixed costs accounted for a very small proportion of the total costs. It was about 5 percent when family labour was not costed and about 3 percent when family labour was considered. This is always the case with small scale farmers who usually do not invest on fixed capital assets for production process.

Table 4.10: Average Costs per Hectare of Farm Production for Respondents in Maigana Zone of KADP

Variable Specification	Cost/Hectare	Percentage of Total	
	N	Excluding Family Labour	Including Family Labour
A. Variable Costs			
Seeds	498.40	4.73	2.77
Fertilizer	3,684.49	34.99	20.49
Organic fertilizer	400.00	3.80	2.22
Insecticides	1,000.00	9.50	5.56
Transportation	343.60	3.26	1.92
Family labour	7,449.16	-	41.43
Hired labour	4,120.29	39.12	22.92
SUB-TOTAL	17,495.95		
B. Fixed Costs			
Depreciation on equipment	484.47	4.60	2.69
C. Total Cost excluding cost of family labour	10,531.26	100.00	-
D. Total Cost including cost of family labour	17,980.42		100.00

Labour valued at N12.00/man-hour
Also see appendix for unit costs of inputs

Source: Survey data, 1996.

4.4.2 Returns from Farm Production in the Study Area

Table 4.11 shows that the gross returns from a hectare of farm production in the study area was N28,463.97. Hired and family labour amounted to N11,569.45. The net farm income was N10,483.55. The gross returns per man-hour was N2.46 and the net farm return per man-hour was N0.71 when family labour was not costed. Return to family labour, management and capital was N20,014.81/ha while return to capital and management was N16,894.52/ha. There was also a return of N1.58 per naira invested in the area. This analysis revealed that even though profitability does not rank highest when the overall farmers' production goals was considered, profit consideration still occupies a place in their decision making process. It also shows that farming is a profitable enterprise in the area. These figures when compared with other productivity studies in recent past e.g Ali (1995) gave similar results. The net returns per man-hour, per naira invested and gross return per man-hour were particularly consistent with many past studies by Tarfa (1990) and Mohammed (1988). However, the gross return, net farm income were comparatively higher due to general inflation level in the economy.

Table 4.11: Returns per Hectare and Man-Hour for Farm Production Among all Respondents in Maigana Zone of KADP

Variables	Value N
Gross return per hectare	28, 463.97
Net farm income	10,483.55
Gross return per man-hour	2.46
Net return per man-hour (a)	0.71
Net return per man-hour (b)	0.58
Return to family labour, Management and Capital/ha.	20,094.81
Return to capital and Management	16,894.54
Return per naira invested	1.58

(a) When family labour was not costed

(b) When family labour was costed.

4.4.3 Produce Sold and Consumed as a Percentage of Total Production in the Study Area

As shown in Table 4.12, about 47 percent of maize produced by small scale farmers were consumed while about 54 percent were sold. Looking at sorghum and millet, 38 and 52 percent of the produce were consumed while 62 and 48 percent were sold respectively. On coming to cowpea and rice, only 35 and 38 of the produce were consumed while 65 and 61 percent were sold respectively. The small scale farmers looked at rice and cowpeas as cash crops than other cereals crops grown in the area. However, almost all the soyabean produced were consumed in the area and this may be due to greater awareness of the use of

soyabean as protein rich legume to fortify other cereals and as weaning food for baby. Cotton and pepper too were produced as cash crops.

In contrast to small scale farmers, large scale farmers did not produce soyabeans and pepper while they equally produced cotton as cash crop just like the small scale farmers. On the other hand, 35 percent of the maize produced by them was consumed while 65 percent was sold. Moreso, 28 and 45 percent of sorghum and millet produced were consumed while 72 and 55 were sold up respectively. Also 25 and 23 percent of cowpea and rice produce by large scale farmers were sold up while 75 and 77 percent were sold up.

Looking at the large scale farmers, the large percentage of crops produced by them were sold up for cash due probably to the fact that they have top most in their mind the goal of making profit from their production exercise unlike the small scale farmers who are more interested in maximization of household food security as the topmost goal in their list of priority.

Table 4.12 Products sold and consumed as percentage of Total production in the study area

	Small scale Farmers					Large scale Farmers				
crops	Total produced (kg)	Quantity consumed (kg)	% of Total	Quantity Sold (kg)	% of Total	Total Producted (kg)	Quantity consumed (kg)	% of Total	Quantity sold (kg)	% of Total
maize	391032.12	181829.94	46.50	209202.18	53.50	260688.08	91240.82	35	16944.25	65
sorghum	230338.70	87547.71	38	142840.9	62	147397.70	4124.36	28	106054.35	72
millet	33063.71	17060.87	51.6	16002.84	48.4	15559.39	7001.73	45	8557.66	55
cowpea	18350.74	6349.36	34.6	12001.38	65.40	81350.52	20337.63	25	61612.89	75
Rice	54233.60	20988.43	38.70	33245.17	61.30	13288.46	3056.35	23	10232.11	77
soyabean	958	682.10	71.20	275.90	28.80	-	-	-	-	-
cotton	2000	-	-	2000	100.00	22500	-	-	22500	100.00
pepper	1200	140.40	11.70	1059.60	88.30	-	-	-	-	-

Source: survey data, 1996

4.4.4 Farm Operational Characteristics Among the Various Group of Farmers in Maigana Zone of KADP

Table 4.13 shows the characteristics of various groups of farmers in the study area. When all the 85 farmers sampled were considered, the average farm size was 3.87ha while on grouping the farmers to small and large scale farmers, small scale holders have average farm size of 2.14ha and big scale on the other hand have average farm size of 9.15ha. All the 85 farmers have average labour of 964.12 mah-hours while the small scale farmers used 1056.47 man-hours of labour. It is clear from here that big scale farmers use less man-hour of labour than the small scale farmers. This is because small scale farmers rely more on the use of family labour which they often over used most of the time. The big scale farmers minimization of excessive labour input is consistent with the goal of profit making they are pursuing.

On capital use, all the farmers sampled together made use of capital worth N621.63/ha for farm production while small scale farmer used capital worth N470.31/ha and big scale farmers used capital worth N1,710.00 per ha in their farm operation. The large scale farmers as shown here made use of more capital inputs than small scale farmers. The differences here is due to non possession of durable farm implement like tractors workbulls and vehicles by small scale farmers as against medium and large scale farmers who possess these items.

While large scale farmers will allocated more of their land to the production of crops that are meant for market to earn more

income, the small scale farmers will be more concerned in allocating land and other production resources to the production of crops that will ensure maximization of food security for their household. However since the same crops produced for food are the ones meant for sale to earn revenue, it is difficult to seggregate resource allocation into those meant for cash crops and those meant for food crops in the study area.

Table 4.13: Farm Operational Characteristics Among the Various Group of Farmers in Maigana Zone of KADP

Group of Farmers	Average Farm Size (ha)	Labour Use/ha	Capital Use/ha
All farmers	3.87	964.12	621.63
Small scale	2.14	1056.47	470.31
Large scale	9.51	798.43	1710.00

Source: Survey data, 1996.

CHAPTER FIVE

5.1 EVALUATION OF OBJECTIVES OF FARM PRODUCTION

From the preliminary survey conducted, nine major objectives/goals were identified as the determinants in farm production decision making among the farmers in the study area. They are to:-

(i) Maximize *Farm Household Food Security* (MHFS)

(ii) Minimize Borrowing Money for Production (MBMP)

(iii) Generate as Large Surplus Produce as Possible (LSPP)

(iv) Make Maximum Profit each year (PROF)

v) Limit out of Pocket Cash Expenses on Farm Production (LPCE)

(vi) Make Regular Income all Year Round (RIYR)

(vii) Limit the Extent of Post Harvest Losses (EPHL)

(viii) Generate Stable Employment for Household Member (SEHM)

(ix) Maximize Social Status (TMSS)

The results in this section are presented in two different ways: (i) The whole data collected on goal ranking was pooled together and analysed to determine the goals preference among the whole farmers sampled in the area. (ii) The farmers sampled were categorized into two groups of small scale and fairly large to large scale farmers. Each of the two groups was analysed to see whether there was a difference from small and large scale farmers and comparison made between what was obtained with the observation from the whole data in the earlier analysis.

5.1.2 Evaluation of Identified Objectives of Farm Production for Degree of Popularity Among all the Farmers in the Study Area

The analysis here is meant to determine the extent to which an objective can be regarded as popular among all the farmers sampled. The method adopted in this analysis was to determine the frequency with which the farmers regarded each of the identified objectives as important. An objective is regarded as important if it falls within the first five positions in the individual farmer's ranking.

From Table 5.14, 5 objectives appeared to be very wide spread among the farmers in the study area. These are the objective of Maximizing Farm Household Food Security (MHFS), Minimizing Borrowing Money for Farm Production (MBMP); to Generate as Large a Surplus Produce as Possible (LSPP); to Make Maximum Profit each Year (PROF), and to Limit out of Pocket Cash Expenses on Farm Production (LPCE) in that order of preference.

A major observation from the table is that even though profit making was among the five topmost objectives for consideration by the farmers in guiding their resource allocation and production decision making, it was not among the three topmost in their ranking. Rather than aimed at profit maximization, they were more conscious at ensuring maximum food security for their households, minimizing borrowing for farm production and making as large a surplus produce as possible. By 100 percent response under the objective of maximizing household food security, it can be inferred that majority of the farmers

are basically operating at subsistence levels. Infact the average farm size for all the 85 farmers sampled in the area was 3.87ha while the smallest farmer owns 0.4ha of farmland. Also, the objectives of minimizing borrowing money for production is a characteristic attitude of small scale farmers who have the fear and tendency to avoid the risk of borrowing since such borrowing for production might bring them to an embrassing debt position that can ridicle them in their immediate environment if there is crop failure or poor market thereby incapacitating their ability to repay their loans. They also aimed at generating as large a surplus produce as possible and that may be one of the reasons why they plant different crops as possible on their farms so that maximum use could be made of the area cultivated. Figure 1.0 shows the pictorial presentation of the distribution of farmers according to popularity of particular objectives of farm production. The presentation on the bar graph is in conformity with what is contained in Table 5.14. It shows that farmers preferred these objectives in the following order:- MHFS preferred to MBMP, MBMP preferred to LSSP, LSPP preferred to PROF and so on as shown on the graph.

Their inability to place the tompmost priority on profit maximization may be attributed to lack of record keeping, lack of computational facilities and managerial skills needed to adequately compare revenue with costs. Knowledge in these vital areas are needed to operate a profitable business the absence of which is not making small farmers to reason along profit

consideration.

Although, we have been able to assess the popularity of the various objectives among the farmers, the need to know what exactly is the structure of the average farmer choice with regards to these objectives will further be examined. That is, what is the order of preference of the objectives as they affect the production and resource allocation decision of the average farmer within the study area? This is considered in the next section.

Table 5.14: Distribution of Farmers According to Popularity of Particular Objectives of Farm Production in Maigana Zone of KADP

S/N	Objectives of Farm Production	Label	No. of Farmers	% of Total
1	Maximizing Household Food Security	MHFS	85	100.00
2	Minimizing Borrowing Money for Production	MBMP	75	92.94
3	Generating as Large a Surplus Produce as Possible	LSPP	65	76.47
4.	Make Maximum Profit each Year	PROF	57	67.47
5	Limiting out of Pocket Cash Expenses	LPCE	57	63.53
6	Regular Income Year Round	RIYR	42	49.41
7	Limiting the Extent of Post Harvest Losses	EPHL	38	44.71
8	Stable Employment for Household Member	SEHM	36	42.35
9	To Maximize Social Status	TMSS	17	20.00

Source: Field Survey, 1996.

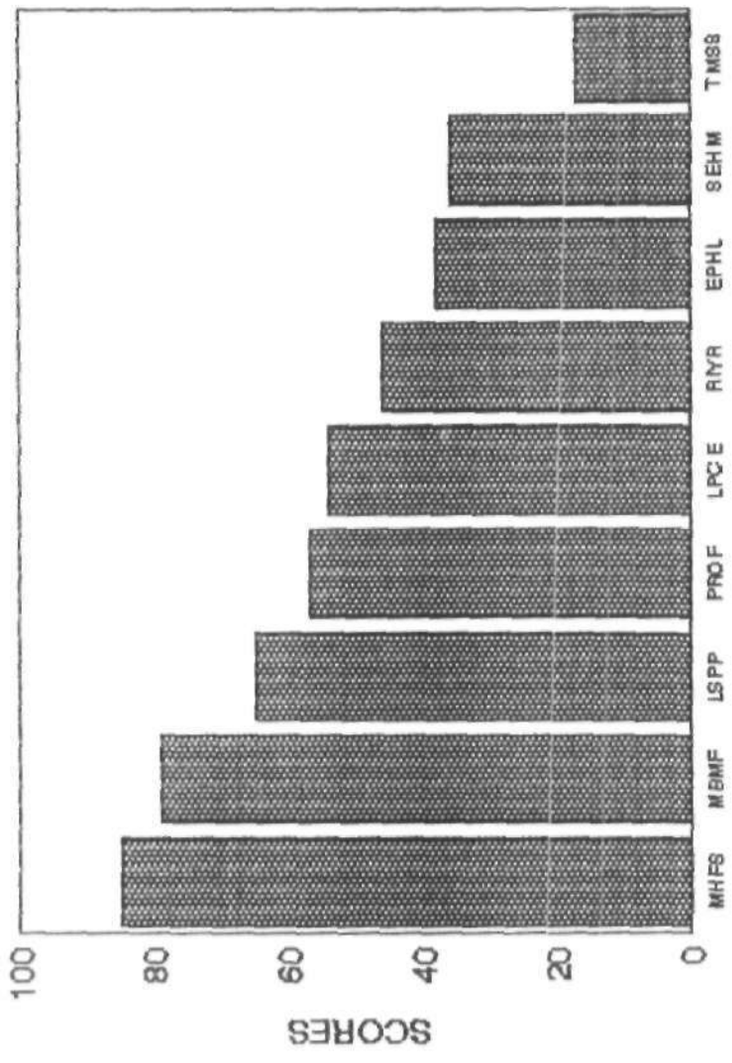


Figure 1. DISTRIBUTION OF FARMERS ACCORDING TO POPULARITY OF OBJECTIVES OF FARM PRODUCTION

5.1.3 Determination of Objectives Preference/Priority Structure Among Farmers in the Study Area

The analysis under this section is aimed at determining in a fairly objective manner the average farmer's subjective priority ranking structure of his objective set. From 5.15, it is observed that when ranked on the basis of total raw scores of each objectives, MHFS was first while MBMP was second and LSPP ranked third. Further still, PROF ranked fourth while LPCE ranked fifth. Thus based on this ranking procedure, it can be said that in making his resource allocation and enterprise combination decisions, farmers in the study area will choose enterprises that will help them achieve these objectives in that order of preference. This shows that farmers would first be concerned about food security for their household before thinking of what surplus to sell in the market.

However, when the difference between the total scores for any of the objectives was tested for statistical significance through the least significant difference (LSD) statistical test criterion, it was discovered that there was no statistical difference between one goal and the next one after it except for PROF and EPHL. On the basis of LSD criterion MHFS, MBMP and LSPP all together ranked first when all the farmers sampled were considered while PROF, LPCE and RIYR all ranked fourth and EPHL, SEHM and TMSS all raned seventh. This shows that farmers in the study area may assign equal weight to the first three objectives while taking decision for production and resource use allocation.

They will equally assign equal weight to PROF, LPCE and RIYR when making their decisions on production and resource use allocation. Equal weight also will be assigned to the last three objectives namely EPHL, SEHM and TMSS. Figure 2 also conformed with the result presented in Table 5.15 showing the closeness of the goals grouped in the three categories when all the farmers sampled were considered.

TABLE 5.15 Matrix for Objective Priority Rank Computation Through Pairwise Comparison Technique for 65 Small Scale Farmers in Maigana Zone of KADP

GOAL	MHFS	MBMP	LSPP	PROF	LPCE	RIYR	SEHM	EPHL	TMSS	TOTAL	RANK[a]	RANK[b]
MHFS		61.00	19.00	51.00	76.00	65.00	79.00	84.00	81.00	616.00	1st	1st
		(71.76)[d]	(22.35)	(60.00)	(89.41)	(76.47)	(92.94)	(98.82)	(95.29)			
MBMP	24.00		56.00	51.00	71.00	60.00	80.00	82.00	82.00	506.00	2nd	1nd
	(28.24)		(65.88)	(60.00)	(83.53)	(70.59)	(94.12)	(96.47)	(96.47)			
LSPP	66.00	29.00		62.00	40.00	57.00	77.00	78.00	71.00	480.00	3rd	1nd
	(77.65)	(34.12)		(72.94)	(47.06)	(67.06)	(90.59)	(91.76)	(83.53)			
PROF	34.00	34.00	23.00		46.00	58.00	65.00	75.00	73.00	408.00	4th	4th[c]
	(40.00)	(40.00)	(27.06)		(54.12)	(68.24)	(76.47)	(88.24)	(85.88)			
LPCE	9.00	14.00	45.00	39.00		62.00	78.00	63.00	78.00	388.00	5th	4th
	(10.59)	(16.47)	(52.94)	(45.88)		(72.94)	(91.76)	(74.12)	(91.76)			
RIYR	21.00	25.00	28.00	27.00	23.00		76.00	55.00	80.00	335.00	6th	4th
	(24.71)	(29.41)	(32.94)	(31.76)	(27.06)		(89.41)	(64.71)	(94.12)			
EPHL	6.00	5.00	8.00	20.00	7.00	9.00		42.00	72.00	169.00	7th	7th[c]
	(7.06)	(5.88)	(9.41)	(23.53)	(8.24)	(10.59)		(49.41)	(84.71)			
SEHM	1.00	3.00	7.00	10.00	22.00	30.00	43.00		47.00	163.00	8th	7th
	(1.8)	(3.53)	(8.24)	(11.76)	(25.88)	(35.29)	(50.59)		(55.29)			
TMSS	4.00	3.00	14.00	12.00	7.00	5.00	13.00	38.00		96.00	9th	7th
	(4.71)	(3.53)	(16.47)	(14.12)	(8.24)	(5.88)	(15.29)	(44.71)				

Source: Survey data, 1996
1: LSD at 0.05 level = 61.20
a: Ranking based on addition of total raw scores
b: Ranking at 0.05 level of significance
c: Ranking significant at 0.05 level
d: Numbers in parenthesis indicate percentage of the total respondent represented by the frequency.

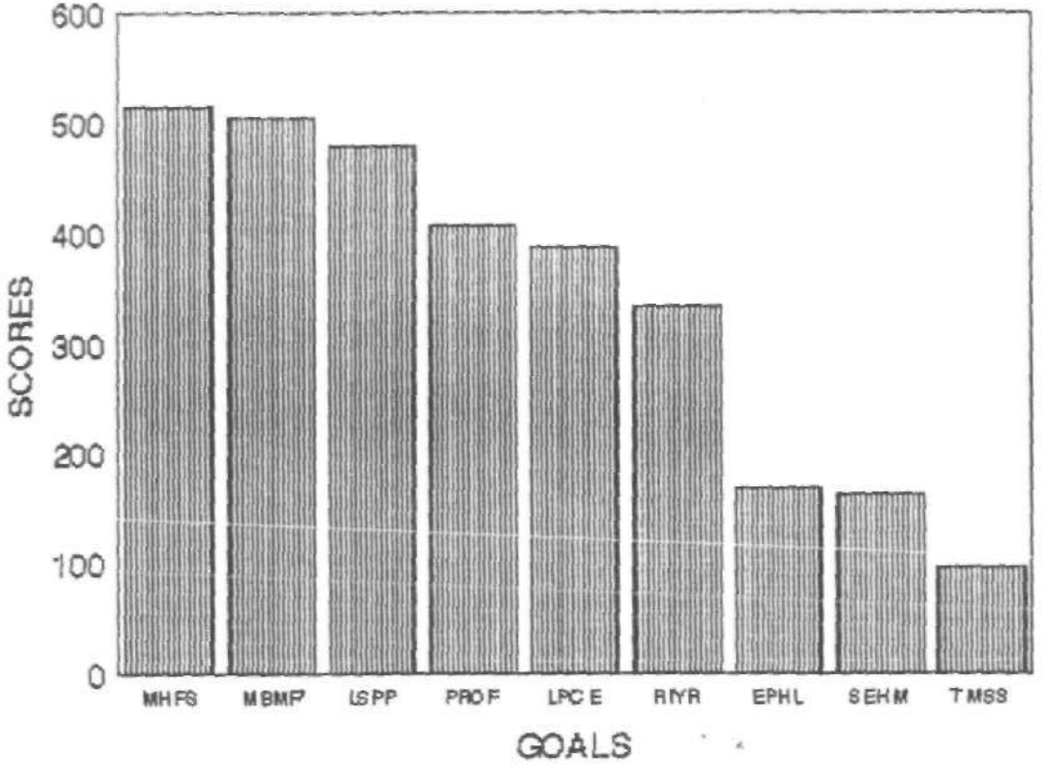


Figure 2. FARMERS' MATRIX OF OBJECTIVE PRIORITY RANKING THROUGH PAIR-WISE COMPARISON TECHNIQUE

5.2 Determination of Objective Preference/Priority Structure Among Small Scale Farmers in the Study Area

Out of the 85 farmers sampled randomly for this study, 65 were small scale farmers with the average farm size of 2.2ha. The smallest farmer has a farm of 0.4ha. The goals preference of these smallest farmers are considered here to see how the majority decisions and goals preference by small scale farmers have influenced the results obtained in the preceding section. This is highly appreciated considering the fact that majority of the farmers in the study area are small scale farmers.

The result obtained here is similar to the result in the preceding section. When the total raw scores were considered, it shows that the small scale farmers in the study area preferred MHFS as the first objective in their priority ranking while MBMP was second preferred objective and LSPP was preferred as third objective. On the other hand, PROF and LPCE were preferred fourth and fifth respectively. It means in their resource allocation and production decision making process, small scale farmers in the area will put topmost in their consideration food security for their household. As the second consideration, they will want to minimize borrowing money for production purpose probably because of the risk involved and thirdly, they will want to organise their little resources so that they can generate as large a surplus produce as possible so that they can have enough food to feed their family. From this result, it could be seen that even though some of the farmers are operating somewhere

above subsistence level as indicated by their mean farm size of 2.24ha majority are purely operating at subsistence level with farm size of about 0.4ha. Subsistence oriented farmers are more concerned with food availability for their family than profit making and their production goals are not geared towards profit making. They therefore hardly keep records of their expenses on production. Their records keeping ability is also partly impaired by their level of literacy. Figure 3 also corroborates the results presented on Table 5.16. It shows in pictorial bar chart the order of goals preference by small scale farmers in the study area.

TABLE 5.16 Matrix for Objective Priority Rank Computation Through Pairwise Comparison Technique for 65 Small Scale Farmers in Maigana Zone of KADP

GOAL	MHFS	MBMP	LSPP	PROF	LPCE	RIYR	SEHM	EPHL	TMSS	TOTAL	RANK[a]	RANK[b]
MHFS		48.00	51.00	37.00	59.00	50.00	64.00	60.00	62.00	431.00	1st	1st
		(73.85)[d]	(78.46)	(56.92)	(90.77)	(76.92)	(98.46)	(92.31)	(95.38)			
MBMP	17.00		41.00	37.00	52.00	47.00	63.00	57.00	53.00	367.00	2nd	2nd
	(26.15)		(63.08)	(56.92)	(80.00)	(72.31)	(96.92)	(87.69)	(81.54)			
LSPP	14.00	24.00		47.00	36.00	41.00	58.00	58.00	52.00	330.00	3rd	2nd
	(21.54)	(36.92)		(72.31)	(55.38)	(63.08)	(89.23)	(89.23)	(80.00)			
PROF	28.00	28.00	18.00		39.00	45.00	58.00	55.00	56.00	327.00	4th	2nd
	(43.08)	(43.08)	(27.69)		(60.00)	(69.23)	(89.23)	(84.62)	(86.15)			
LPCE	6.00	13.00	29.00	26.00		48.00	45.00	60.00	60.00	287.00	5th	2nd
	(9.23)	(20.00)	(44.62)	(40.00)		(73.85)	(69.23)	(92.31)	(92.31)			
RIYR	15.00	18.00	24.00	20.00	17.00		40.00	58.00	61.00	253.00	6th	2nd
	(23.08)	(27.69)	(36.92)	(30.77)	(26.15)		(61.54)	(89.23)	(93.85)			
SEHM	1.00	2.00	7.00	7.00	20.00	25.00		36.00	39.00	137.00	7th	7th[c]
	(1.54)	(3.08)	(10.77)	(10.77)	(30.77)	(38.46)		(55.38)	(60.00)			
EPML	5.00	8.00	7.00	10.00	5.00	7.00	29.00		52.00	123.00	8th	7th
	(7.69)	(12.31)	(10.77)	(15.38)	(7.69)	(10.77)	(44.62)		(80.00)			
TMSS	3.00	12.00	13.00	9.00	5.00	4.00	26.00	13.00		85.00	9th	7th
	(4.62)	(18.46)	(20.00)	(13.85)	(7.69)	(6.15)	(40.00)	(20.00				

Source: Survey data, 1996
1: LSD at 0.05 level = 61.20
a: Ranking based on addition of total raw scores
b: Ranking at 0.05 level of significance
c: Ranking significant at 0.05 level
d: Numbers in parenthesis indicate percentage of the total respondent represented by the frequency.

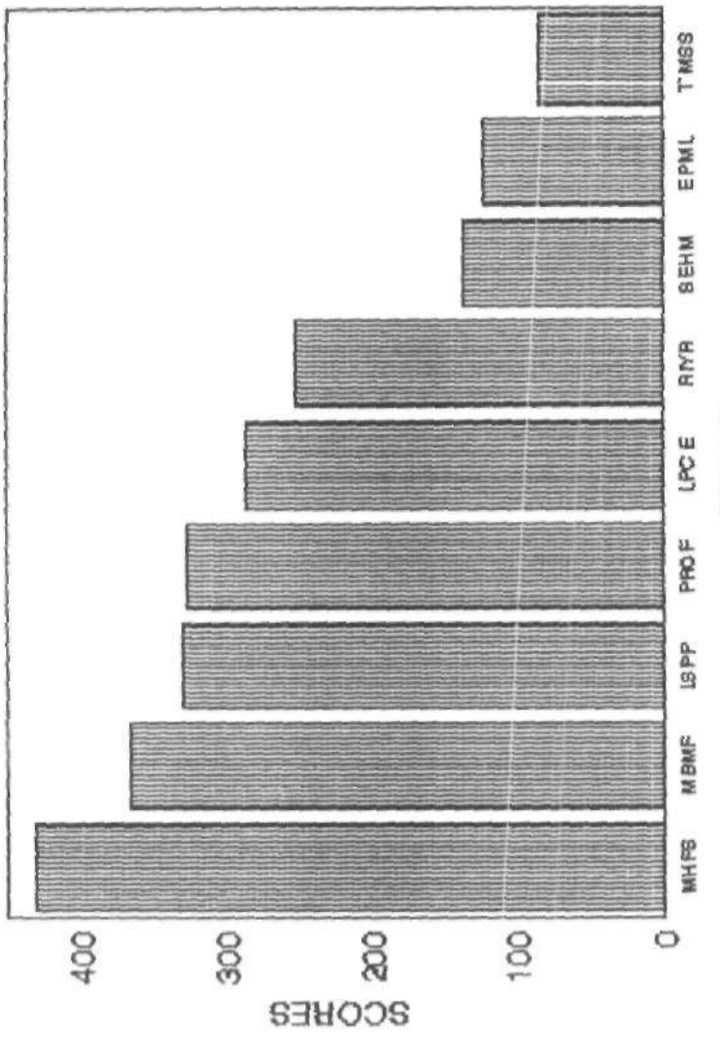


Figure 3. SMALL SCALE FARMERS' MATRIX OF OBJECTIVE PRIORITY RANKING TROUGH PAIR-WISE COMPARISON TECHNIQUE

5.2.1 Determination of Objective Preference/Priority Structure Among Large Scale Farmers in Maigana Zone of KADP

The large scale farmers are small fraction of the respondents sampled in the study area. Out of the 85 farmers randomly selected in the area, only twenty were large scale farmers with mean farm size of 9.5ha. The goals preference of this group of farmers are considered here to see how they differ from those of small scale farmers in the study area considered in the preceding section.

The result obtained here as shown from Table 4.16 revealed that large scale farmers unlike small scale farmers preferred profit making as the most important goal. This is shown by the highest score of 110.00 raw score for profit making. They also preferred generating as large a surplus produce (LSPP) as the second most important goal in their list of preference for decision making. This is somewhat consistent with profit making in a way because large production or output will increase the gross returns and provided that expenditure are kept minimum level, the net income which is profit will increase. The third goal in their list of preference was (LPCE); limiting out of pocket cash expenses on farm production while the fourth was (MBMP) which is minimizing borrowing money for farm production. These two goals are similar in a way because they are both pointer to the fact that farmers in this group even though they are interested in profit making, still reason some ways like small scale farmers who apart from minimizing the investment of

their own money on production, they often show reservation to borrowing of money for production. One of the surest way of boosting large scale production and consequently profit making is to increase investment on agriculture of capital from self savings or borrowed funds from other lending institutions. To actually break some of our farmers away from subsistence syndrome, they have to be encouraged to make use of available resources from whichever sources to expand production so as to bring about food self sufficiency in the country. Their lukewarm attitude towards credit usage will pose great problems to the development of viable formal credit institution in the area. It will also impede rural credit mobilization programme in the area. It will therefore obstruct savings and make investible funds idle and unavailable to the users in the area. The fifth goal in big farmers priority list was (RIYR), that is ensuring all year round income generation while (MHFS), maximization of household food security was seen to be unimportant in their priority list as it occupies sixth position in their scale of preference. This further shows that this group of farmers are producing strictly for profit making rather than ensuring that there is food in the house. It means that the quantity of their produce meant for home consumption was not significant when compared with the total output level. Unlike in the previous sections, EPML and TMSS occupy the seventh and eight position while SEHM was the last. By SEHM coming last, farmers in this group do not see farming as a means of providing employment for their family members but

strictly as a business and as a means of generating income. Figure 4 also shows in a graphical form the result in Table 5.17. From the discussion of the result so far, the following inferences and deduction can be made:

(i)Profit is not a major consideration in the small scale farmers' production decision processes. Therefore, the use of profit maximization models for the analysis of farm decisions problems may not be very appropriate for this group of farmers

(ii)The first 3 major objectives in the small scale farmers objectives set are not consistent with the goal of maximizing economic efficiency in agricultural production. This could thus be a great hinderance to the effectiveness of macro-economic policies geared towards economic efficiency and growth. The implication for national policy is profound if the observed condition is same for other groups of small scale farmers all over the country since small scale farmers are more than 70% of the total farmers producing food and raw materials for the country's need.

(iii) Unlike small farmers, large scale farmers in the study area have preference for profit making as the topmost consideration in making their decision on resource allocation for production activities. Their second goal preference which is to generate as large a surplus produce as possible is consistent with profit making since large output will ensure large gross returns which will invariably raise the level of

profit provided expenses on production are kept at minimum level.

(iv) The large scale farmers were found to consume less of their production and consequently offer substantial percentage of their production for sale.

(v) Finally, contrary to small scale farmers, employment opportunity for household member was the least in the priority ranking of the large scale farmers.

(vi) The results from this study are consistent with the study carried out by Aromolaran (1991) on the evaluation of objectives of small scale farmers in Oyo north of Nigeria. This is despite the fact that these studies were carried out in two distinct ecologies. Oyo north is located in the forest zone of Nigeria while Maigana zone of KADP is in the northern guinea savanna. It is expected that if small scale farmers in the south where land preparation and other farm operations are more difficult have goal orientation that emphasize household food security, that the same group of farmers in the north where the reverse is the case might have conflicting goal orientations. However, the two studies have shown that their goal orientation are actually the same. This will continue to have serious implication for our agricultural and overall economic development untill something drastic is done to make these farmers embrace profit oriented goals which will consequently encourage them to increase their scale of production. This may require the introduction of risk reduction programmes through Nigerian Agricultural and Insurance

Company (NAIC), easy access to credit from Nigerian Agricultural and Cooperative Bank (NACB) and assurance of dependable market.

Table 5.17 Matrix for Objective Priority, Rank Comparison **Through Pairwise comparison** Technique for 20 Large Scale Farmers in Maigana Zone of KADP

GOAL	PROF	LSPP	LPCE	MBMP	RIYR	MHFS	EPML	TMSS	SEHM	TOTAL	RANK
PROF		5.00	12.00	13.00	14.00	15.00	17.00	17.00	17.00	110.00	1ST
		(25.00)	(60.00)	(65.00)	(70.00)	(75.00)	(85.00)	(85.00)	(85.00)		
LSPP	15.00		5.00	6.00	13.00	5.00	19.00	19.00	20.00	102.00	2nd
	(75.00)		(25.00)	(30.00)	(65.00)	(25.00)	(95.00)	(95.00)	(100.00)		
LPCE	8.00	15.00		3.00	15.00	3.00	18.00	18.00	19.00	99.00	3rd
	(40.00)	(75.00)		(15.00)	(75.00	(15.00)	(90.00)	(90.00)	(95.00)		
MBMP	7.00	14.00	17.00		12.00	7.00	13.00	7.00	17.00	94.00	4th
	(35.00)	(70.00)	(85.00)		(60.00)	(35.00)	(65.00)	(35.00)	(85.00)		
RIYR	6.00	7.00	5.00	8.00		16.00	14.00	17.00	16.00	89.00	5th
	(30.00)	(35.00)	(25.00)	(40.00)		(80.00)	(70.00)	(85.00)	(80.00)		
MHFS	5.00	15.00	17.00	13.00	4.00		7.00	8.00	19.00	88.00	6th
	(25.00)	(75.00)	(85.00)	(65.00)	(20.00)		(35.00)	(40.00)	(95.00)		
EPML	3.00	1.00	2.00	7.00	6.00	13.00		19.00	13.00	64.00	7th
	(15.00)	(5.00)	(10.00)	(35.00)	(30.00)	(65.00)		(95.00)	(65.00)		
TMSS	3.00	1.00	2.00	13.00	3.00	12.00	1.00		12.00	47[illegible].00	8th
	(15.00)	(5.00)	(10.00)	(65.00)	(15.00)	(60.00)	(5.00)		(60.00)		
SEHM	3.00	0.00	1.00	3.00	4.00	1.00	7.00	8.00		27.00	9th
	(15.00)	(0.00)	(5.00)	(15.00)	(20.00)	(5.00)	(35.00)	(40.00)			

Source: Survey data, 1996

1: LSD at 0.05 level of significance = 33.95

: Result statistically not significant at 0.05 level.

: Number in parentheses indicate percentage of th total respondents **represented by the frequency.**

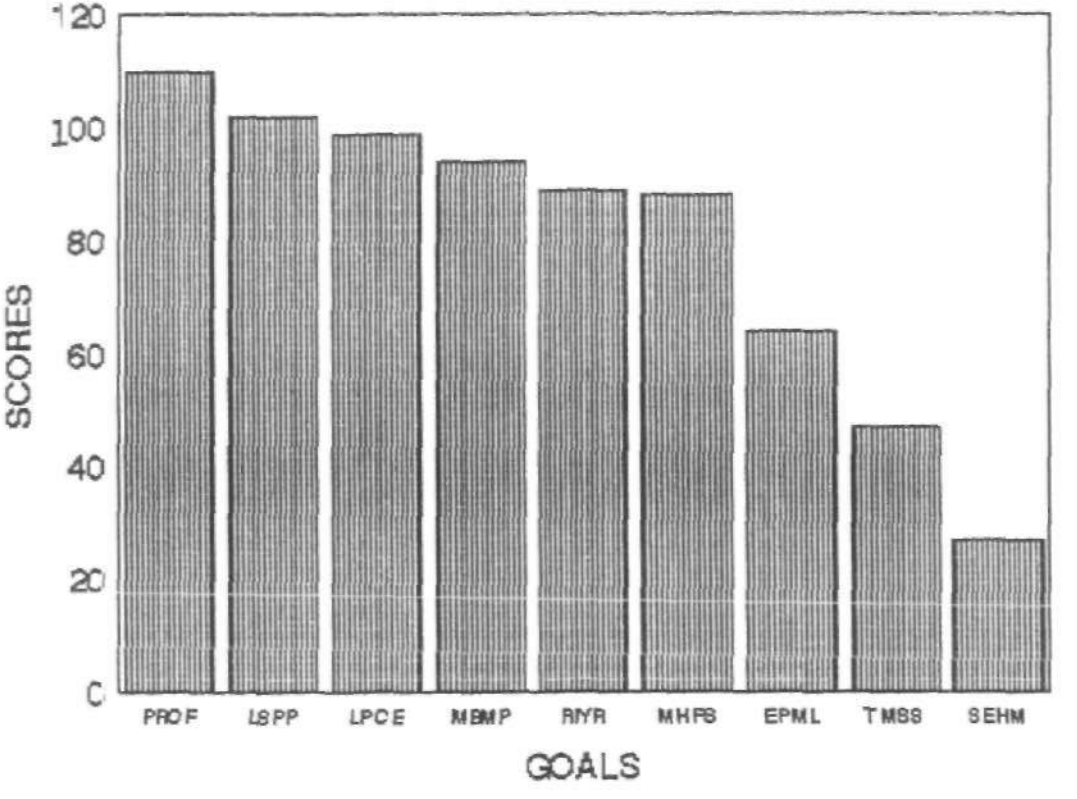


Figure 4. LARGE SCALE FARMERS' MATRIX OF OBJECTIVE PRIORITY RANKING TROUGH PAIR-WISE COMPARISON TECHNIQUE

5.3 Problems Facing Farmers in the Study Area

There were many problems facing the farmers in the study area. They are as presented in Table 5.18.

From Table 5.18, the most serious problem mentioned by almost all the farmers was fertilizer. About 84 percent of the farmer sampled complained of unavailability of fertilizer at affordable price. Fertilizer that was supposed to be sold at official price of N150.00 per 50kg bags were not available at government designated buying centres, but are only available at the open markets at cut throat prices ranging between N450.00 and N800.00 depending on the brand of fertilizers. The result of this ugly development is that many farmers end up using fertilizer that are far below the recommended quantities while some end up not using fertilizer at all. Poor yields have often resulted from this problem to the extent that some farmers may not even harvest enough from their farms for their household consumption. This problem has to be seriously addressed to enhance the productive capacity of the farmers.

Also inadequate tractors for farm operation is another serious problem militating against the performance of the farmers in the study area. The tractor hiring service of ADP and the local government do not have enough tractors and as such could not meet the needs of the farmers in the area at peak periods of land preparation which is between June and mid July. About 55 percent of the farmers complained about this problem.

Farmers also complained about inadequate land and absence of dam in the area as factors militating against their effective agricultural production. Farmers who have interest in expanding their production could not do so because of land problem while those who would loved to engage in production during dry season could not do so because of the absence of dam in the area. About 18 percent of the farmers complained about land while 17 percent complained about absence of dam.

Other infrastructural facilities militating against social and production activities of the farmers in the area are poor roads to the farm making easy evacuation of farm produce difficult. About 21 percent of the farmers complained about this problem. Electricity and pipeborn water are not available in this area too thus making the area unattractive to the young school leavers. About 15 and 22 percent of the farmers complained about electricity and water respectively. Moreso, health facilities in the area are not functioning well to cater for the health needs of the farmers' household and as such farmers and their family have to come to Zaria for their health need. About 27 percent of the farmers raised this complain.

Finally, production loans is a very serious problem for the farmers as they cannot produce collateral needed to enable them get such loans.

Table 5.18: Problems Facing Farmers in the Study

Constraints of Farmers	No. of Farmers	% of Total
Lack of fertilizer	71	83.53
Inadequate tractors	47	55.29.
Poor roads	18	21.18
Electricity	13	15.29
Water	19	22.35
Health facility	23	27.06
Absence of Dam	6	7.06
Inadequate land	15	17.65
Lack of Production loans	22	25.88

Source: Survey data, 1996.

CHAPTER SIX

SUMMARY AND CONCLUSION, LIMITATIONS AND SUGGESTIONS FOR FURTHER RESEARCH

6.1 *SUMMARY AND CONCLUSION*

The findings from the study show that more than 90 percent of the farmers sampled have more than ten years of experience in the system of agricultural production in practice in the study area. There was an average of over 10 persons per household in the study area and more than 60 percent of these were children and women. This will affect considerably the proportion of produce that are available for sale since a very large proportion will be consumed at home. It will therefore confines the farmers to the goal of ensuring that there is enough production to feed their family. Only 20 percent of the farmers had education up to secondary level and above and this could have serious implications on their goals orientation and decision making in their investment plan.

The findings also revealed that farmers in the area practice mixed cropping system. More than 95 perecnt of the farmers practiced mixed cropping and they grow various combinations of crops on their plots. Maize and sorghum were however the most dominant crops in the area as more than 92 and 88 percent of the farmers sampled cultivated maize and sorghum respectively. However more than 76 percent of the farmers sampled were small scale farmers while the remaining falls between medium and large scale holders.

Findings from costs analysis showed that labour alone accounted for about 64 percent of the total costs of production. Any measures taken to reduce labour costs will further enhance profitability of the farm business. The net farm income was N10,483.57 while the gross returns per man-hour was N2.46 and the net farm returns per man-hour was N0.58 and N0.71 with or without family labour respectively. Return to family labour, management was N16,894.54 per hectare. There was a return of N1.58 per naira invested. All these showed that even though farmers major goal was not profit making, farming among the farmers in the area was profitable.

Results on goals evaluation revealed that farmers in the study area have the objective functions that are:-

(i) Characteristically multiple in nature

(ii) The farmers posses a definite priority rank structure for their set of farm production objectives

(iii) In planning his farm production activities, the small scale farmer in the study area combines the following objectives in the following order of preference:

(a) Meet his family food need - food security for household.

(b) Minimize borrowing money for farm production

(c) To generate as large a surplus produce as possible.

(iv) The objective of profit maximization is not considered a major objective among the small scale farmers.

(v) The priority/preference structure of the farmers, which was shown in favour of less economic efficiency oriented goals, may be a major source of hinderance to the achievement of economic growth oriented policies among farmers in the area.

(vi) The large scale farmer on the other hand combines the following objectives in the following order of preference while planning his farm production activities:-

(a) To maximize profit from farm production

(b) Generate as large a surplus produce an possible

(c) Limiting out of pocket cash expenses.

(vii) However, the objective of maximizing household food security which was the first among small scale farmers was seen to occupy sixth position among large scale farmers showing that it was among the least important for consideration in the priority list of the large scale farmers. On the other hand the goal of generating stable employment for household members was the least important among large scale farmers who operate their farm business strictly for profit and will not want to see farming therefore as a means of providing employment for idle family members.

(viii) The effect of decision making by the small scale farmers was very overwhelming on the overall results obtained when all the respondents were treated

together for goals ranking. This is because small scale farmers are in majority, more than 76 percent of the respondents. What we have here could be a reflection of what is happening all over the country in terms of the proportion of small to large scale farmers. It follows therefore that to make Nigeria realize her full potential in the agricultural sector, small scale farmers must be encouraged to embrace production goals that are geared towards profit making. This they should still do without conflict with the goal of producing enough to meet their family food needs.

6.2 Implications of the Findings for Planning and Policy and Recommendations

The findings from this study have implications for policy action and planning.

One of the findings was the very low level of literacy among the farmers despite the adult literacy campaign going on in Kaduna State. Adult education literacy should be stengthened and made more functional. The appropriate agencies should evolve workable plans of action that will help to bring about a substantial increase in adult literacy level since the farmers are generally adults. This will go a long way towards improving the quality of their decisions making process at farm level.

Another problem discovered from the study was unavailability of fertilizer for farming at affordable prices. This has serious

effect on the productivity of the farmers since no meaningful production can take place without fertilizer. Government should evolve at national level plans and policy that will enhance efficient procurement and distribution of fertilizer to farmers in all States of the Federation. Plans should also be geared towards ensuring that the fertilizer companies in the country can live up to expectation of producing enough fertilizers to meet the needs of Nigerian farmers and excess for export to our neighbouring countries to curb smuggling of what is meant for our farmers to other countries.

It was equally discovered that there were limited number of tractors for farmers to hire for their land preparation. This usually led to delay in farm preparation and late planting which results in poor yields. The state and local governments agricultural units and the ADP should purchase enough tractors for hiring to facilitate timely land preparation. The broken down ones should be repaired and government should evolve plans and policies that will encourage farmers' cooperative to own their own tractors which could be made to serve their members and other members of their community.

Lack of dam in the area was shown to have made it impossible for many farmers to engage in dry season farming thus making them idle in the long dry season. Further plans to build dams should consider the people of Maigana zone for irrigation dam development so that the yearnings of the people of this area could be met. Also land decree act should be made effective to

ensure that farmers irrespective of status should have free access to unlimited quantity of land for farming

Other problems from the findings were those of bad roads to the farms making easy evacuation of farm produce difficult and poor health facilities. The roads earlier constructed in the area by DFRRI are now in deplorable conditions. Government through the appropriate agencies should complete the construction of these roads so as to put smiles into the faces of these farmers. The health facilities in the area should be upgraded and doctors made available to attend to the needs of these farmers.

It was equally discovered that farmers whether small or big have multiple goals or objectives for embarking on production. While there may not be any plan or policy by the government to change this, government could induce farmers through some policy action to emphasize limited goals that will have bearings on economic devlopment and self-sufficiency in food production. It could be in the form of price support and land preparation as currently undertaken by NALDA all over the federation. Such policy could help the farmers to increase their production considerably. It has been discovered from goal ranking that small scale farmers placed the highest emphasis on maximizing household food security. This priority ranking of small scale farmers who constitute more than 70 percent of our farmers in favour of less economic oriented goals may be a major source of hinderance to the achievement of economic growth in the

agricultural sector in particular and the overall economic development. This group of farmers should be induced to change their goal orientation in favour of profit oriented production. Plans should be put in place to ensure that all inputs and production constraints are removed to encourage them move from small scale to large scale producers. There should be policy put in place to purchase excess produce at harvest to prevent glut in the market which can dampen their interest.

It is very unfortunate that the second goal in their priority ranking was to minimize borrowing money for production. Given their poor income and poor savings, this has serious implication for increased production. How will they be able to increase their production without using credit? Plans should be on to educate these farmers that there is nothing bad in using credit provided it is used properly. All impediments on their ways to credit acquisition should also be removed to make credit acquisition easier for them.

With the few large scale farmers in the area already in the vanguard of profit oriented production goals, what is needed all over the country is to evolve policy that will help farmers move from their small scale production to large scale holders thereby making the country not only self-sufficient but an agro-exporter to the sub-region.

Measures should be put in place to ensure that farmers prefer more growth oriented objectives, such as profit maximization, gross margin or gross farm income to other such as

food security for household, minimizing borrowing money for farm investment, all of which imposes limitations on the attainment of economic optimum of small scale farmers.

6.3 Limitations of the Study

This study is, however, not without limitations. One of such limitations relates to data collection difficulty. Confronting the farmers with as much as 36 pairs of goals for ranking was a very cumbersome and confusing exercise. It requires a lot of patience and time to get farmers to respond to such complex interview.

There was equally the problems of appropriate tools to compare relationships between the identified goals and household characteristics such as farmer's age, educational level, household size, etc. This type of tool would have enabled me to do analysis that will show how these variables relate with farmers' goals in the study area.

The limitations cited notwithstanding, the study could be said to have achieved its objectives. It has been able to identify the goals preference of farmers in the study area. It was equally able to bring out the clear differences in the goals preference of small and large scale farmers in the study areas as well as highlighting the constraints militating against the attainment of farmers' production. These discoveries could be viewed as the author's modest contribution towards evolving strategies that could help policy makers to reorientate farmers

towards growth oriented objectives that will contribute in no small way towards enhancing the country economic growth and development.

4.6 *Suggestion for Further Study*

From the findings and conclusions of this study, the following recommendations are made:-

(i) More studies should be conducted all over Nigeria to ascertain the structure of the objective function of the Nigerian farmers.

(ii) Effort should be made in any further studies to examine the relationships between the farmers' identified goals and household characteristics such as farmer's age, number of children, year of experience in farming, educational level *e t cetera*. Thurn stone's scale values and the law of comparative judgement techniques should be employed so that regression analysis could be use to show how farmers goals will behave when regressed with these household characteristics mentioned above. Presently, the softwares to do these analysis are not available here and it is envisaged that they will soon be available to accomodate such analysis.

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Appendix I

Unit cost of Inputs and Output from Production in Maigana KADP Zone in 1995.

Item	Unit (kg)	Price (N)
Maize	1	5.40
Sorghum	1	4.50
Millet	1	6.40
Rice	1	19.80
Cowpea	1	15.50
Soyabean	1	16.00
Cotton	1	26.00
Pepper	1	12.00
Fertilizer	1	9.00

Appendix II

Product	Tiya	(kg)
Maize	1	2.63
Sorghum	1	2.74
Millet	1	2.65
Rice (milled)	1	2.80
Rice (unmilled)	1	2.08
Soyabean	1	2.69
Cowpea	1	2.59

1 bag = (100kg/bag) = 40 tiyas

Source: Average of measurement taken in three villages converted to standard unit (field survey, 1996).