SOCIO-ECONOMIC FACTORS AFFECTING ADOPTION OF COWPEA PRODUCTION TECHNOLOGIES IN IWO LOCAL GOVERNMENT AREA OF OSUN STATE

BY

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DECLARATION

I hereby declare that this thesis has been compiled by myself and that it is a record of my own research work. It has not been accepted in any previous application for a higher degree.

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CERTIFICATION

This thesis entitled "Socio-Economic Factors Affecting Adoption of Cowpea Production Technologies in Iwo Local Government Area of Osun State" meets the Regulations Governing the Award of the Degree of Master of Science (Agricultural Extension and Rural Sociology) of Ahmadu Bello University, Zaria, and is approved for its contribution to knowledge and literary presentation.

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This work is dedicated to my children, Lukman Olaitan Akanni Ande and Nureni Olajuwon Akanmu Ande.

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I am grateful to Almighty Allah who has helped me in all things that I have been involved in. I am also grateful to my parents who have given me the opportunity to taste the juicy fruit of education.

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ABSTRACT

This study investigated the socio-economic factors affecting farmers' adoption of cowpea production technologies in Iwo Local Government Areas of Osun State. The objectives of the study were to:

i. identify the socio-economic characteristics of farmers in the study area;
ii. determine the level of farmers' awareness and adoption of recommended cowpea production technologies in the area;
iii. determine those factors related to farmers adoption of the technologies; and
iv. draw conclusions from the findings and make recommendations on how to improve on the existing level of adoption of recommended cowpea production technologies in the area.

Field survey on 103 farmers was analysed using descriptive statistics, Pearson Product Moment Correlation Coefficient and stepwise regression analysis. Results of analysis showed that Iwo Local Government peasant farmers are typically full-time farmers, about 51 years old. They are literate with an average farm size of about 2 ha and they own their land directly through inheritance as well as purchase. About half of farmers were aware of the recommended technologies. However, the farmers adoption level was relatively low.

Results of correlation analysis also showed that socio-economic characteristics, such as labour availability, cooperative membership, credit availability, farming experience, practicing of additional occupation, extension contact, farm size and age were significantly related to adoption of the technologies at 0.05 level. On the other hand, tenure status and level of formal education, even though related to adoption, are not significant. A further analysis, using stepwise regression procedures, reveals that these variables taken together explained about 42% of the variability in adoption behaviour with labour availability and cooperative membership making the greatest contribution.

It was recommended that more input distribution centres be sited in strategic areas. It was also advised that an effective campaign be mounted to educate farmers on the advantages of improved technologies. Incentives, subsidies and credit facilities should be provided to the farmers to enable them purchase needed farm inputs necessary for adoption of new technologies.

TABLE OF CONTENTS

	Page
Title:.....	i
Declaration:.....	ii
Certification:.....	iii
Dedication:.....	iv
Acknowledgement:.....	v
Abstract:.....	vi
Table of Contents:.....	viii
List of Tables:.....	x
CHAPTER	
1.0 **INTRODUCTION**.....	1
1.1 The problem Statement:.....	6
1.2. Objectives of the Study:.....	8
1.3 Justification of the Study:.....	8
2.0 **REVIEW OF LITERATURE AND THEORETICAL FRAMEWORK**...	12
2.1 Review of Related Literature:.....	12
2.1.1 Personal Characteristics of Farmers and Adoption:.....	13
2.1.2 Farmers and Response to Change:.....	21
2.1.3 Reasons for Farmers Rejection of Innovations:.....	23
2.1.4 Reasons for Farmers Acceptance of Innovations:.....	24
2.1.5 Extension Workers Characteristics and Adoption:.....	27
2.2 Theoretical Framework:.....	29
2.3 Hypothesis:.....	32

3. **METHODOLOGY**..... 33

3.1 The Study Area:..... 33

3.2 *Socio-economic* Characteristics of the People in the Area:..... 34

3.3 Sampling Procedure:..... 35

3.4 The Technology Package:..... 36

3.5 Statistical Analysis:..... 37

3.6 Operationalization of Variables:..... 38

4.0 **FINDINGS AND DISCUSSION**..... 43

4.1 Socio-economic Characteristics of the Farmers' Studied:..... 43

4.2 Awareness and Adoption of Recommended cowpea Production Technologies:..... 45

4.3 Farmers' Reasons for Adoption or Rejection of Technologies:..... 47

4.4 Correlation of Factors Associated with Adoption:..... 49

5.0 **SUMMARY, CONCLUSION AND RECOMMENDATIONS**..... 61

5.1 Summary of Findings:..... 61

5.2 Conclusion:..... 63

5.3 *Recommendations*:..... 65

5.4 Suggestion for Further Studies:..... 67

References:..... 68

Appendix A: Farmers Interview Schedule:..... 74

Appendix B: Tables:..... 80

LIST OF TABLES

TABLES		PAGE
1.	The Extent of Farmers' Awareness of Cowpea Production Technologies in Iwo Local Government Area of Osun State:.....	45
2.	The Extent of Farmers' Adoption of Cowpea Production Technologies in Iwo Local Government Area of Osun State:.....	46
3.	Gap Between Awareness and Adoption of Recommended Cowpea Production Technologies in Iwo Local Government Area of Osun State:...	47
4.	Distribution of Farmers According to their Reasons for not Adopting the Recommended Cowpea Production Technologies:.....	49
5.	Distribution of Farmers According to their Reasons for Adopting the Recommended Cowpea Production Technologies:.....	49
6.	Correlation Matrix Showing Relationship Between Variables:.....	51
7.	Summary of the Stepwise Regression Analysis:.....	58

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CHAPTER ONE

1.0 *INTRODUCTION*

Agriculture is an important sector of the Nigerian economy since a majority of the population derives its livelihood from it. The wealth of Nigeria is based largely on agricultural production.

Provision of a reliable and affordable food surplus for the populace of any nation is one of the fundamental ingredients for accelerated national development. However, in the past two decades, agricultural development in Nigeria has suffered a lot of set back due to the new found wealth from petroleum (Asiabaka, 1991). Since the mid-60s, the agricultural sector in Nigeria has not been able to cope with the demand made on it by increased urbanization and rapid population growth. Food supply situation has not responded adequately to the growing demand for both domestic and industrial needs. There has been a noticeable disparity between the annual growth rate of food distribution and the annual rate of population growth. While the annual rate of population growth in Nigeria is estimated at between 2.5 and 3.0 percent, that of food production is between 1.0 and 1.5 percent (Williams, *et al*., 1990).

One of the greatest problems confronting millions of Nigerians today is lack of adequate protein intake both in

quality and in quantity to feed the nations evergrowing population (Akintola, 1993). Any serious deficiency in the amount of protein intake may hinder people's health particularly individual mental capability, productivity and eventually the overall national economic growth itself. Eventhough, government (local, state and federal) as well as individuals and national and international organizations have taken steps toward solving these problems, no positive result has been obtained (Asiabaka, 1991).

Food consumption in Africa is governed by many well established rules and customs. In many parts, meat is rarely consumed because its consumption is a taboo and milk is still traded in only very small quantities. These animal derived proteins are expensive and require either extensive areas of pasture or large imports of stock feed or both. Besides, the tse-tse flies which carry trypanosomiasis impose greater restriction on livestock development (FAO, 1978). Where fish is found locally, it is generally greatly appreciated. Unfortunately, it is too expensive in relation to the income of the African consumer so that except in the case of river side or coastal population, per caput consumption is very low (Jalil, 1965).

Since it is not expected that the production and consumption of animal protein can be increased relative to the

needs of the population, special attention must be given to sources of vegetable proteins. Among vegetable foods, grain legumes, including all kinds of beans and peas, stand out as the richest source of protein. Dry, they contain 15-38 percent protein, 3 to 4 times more than cereals and 10 times more than tubers. If their consumption were increased, they would improve the balance of African diets and counter the effect of protein malnutrition (FAO, 1978; Jalil, 1965). Food legumes represent a vital component of the diet in many countries of the world. They provide a concentrated source of high quality protein and are valuable supplement to the cereal based diets in areas where animal protein (milk, meat and fish) is less available.

According to Wallis and Byth (1987), the recent report of the FAO/WHO/UNO expert consultation on energy and protein requirements of the human diet set the required level for good quality digestible protein at 0.75g per day for both sexes. According to them, these levels can be satisfied by wheat and rice-based diet for adults over a wide range of energy requirements and body weights, provided sufficient cereal is consumed. The addition of legumes to the diet reduces the requirement for cereals and provides a more concentrated and better quality protein. It adds variety to the diet. Also, the capacity of food legumes for symbiotic nitrogen fixation may reduce the requirements for nitrogen fertilizer even

though there seems to be considerable variation in the nitrogen contribution from this source. Other advantages of growing legumes are to break the cycle of cereal cropping and reduce the incidence of soil-borne diseases and use of their residues after harvest as a valuable source of animal feed.

However, despite their importance in human and animal nutrition and to the stability of farming systems, food legumes have not received the support afforded to cereal production in Nigeria. The fostering of cereal production, together with many other factors has led to the situation in which food legumes are regarded as secondary crops, which further discriminates against their development and improvement. Production of pulses, in the developing world, in 1984, represented only 3.7% of cereal production and the annual rate of growth of 1.3% over the last decade is low compared with the 3.7% growth recorded for the major cereals (Mc William and Dillon, 1987).

The current belief the world over that improvement of the quality of life is possible at a faster rate by adoption or adaptation of modern technology in medicine, engineering, commerce and industries is also applicable to agriculture. Use of modern technology in agriculture is the order of the day in the developed world (Ortese, 1989). Much of the expected development in agriculture depends on the adoption

and diffusion of agricultural innovations.

It is generally conceded that agricultural extension services provide the vital link between researchers and practicing farmers. The extension agencies function as the conduit for bringing agricultural innovations to farmers as well as farmers' problems to the scientists. Inspired by the successes recorded at the Funtua, Gusau and Gombe Agricultural Development Projects and backed by the World Bank loan, many Agricultural Development Projects (ADPs) were initiated to facilitate the transfer of improved agricultural technologies to farmers for use on the farm (Adefuye and Adedoyin, 1993).

In Nigeria today, there are many improved production packages available that can be used to improve upon the principal cropping systems in the country. These packages are developed principally by the National Agricultural Research Institutes, the International Research Centers and of recent the Agricultural Development Projects (ADPs) for the improvement of the major crops such as maize, cowpea, sorghum etc. Some of the improved cowpea cultivars that have been developed and recommended for use are: Ife brown, IT82D 716, IT82D 699, IT86D 715, IT86D 710 and IT84D-2246-4. Others are IAR 330-1 (SAMPEA 1); IAR 353 (SAMPEA 2) IAR 341 (SAMPEA 3); IAR 176B (SAMPEA 4); IAR 355 (SAMPEA 5); and IAR 1696 (SAMPEA 6). For these crops, the specific components of the

technological packages include; recommended spacing, planting time; use of insecticide e.g. Nuvacron, cymbush and rogor; use of fungicide e.g. benlate. Use of fertilizer especially single superphosphate (SSP) and weed control.

These improved technologies have been introduced to the peasant farmers in Iwo Local Government Area of Osun State principally by the Institute of Agricultural Research and Training (IAR&T), Agricultural Extension and Research Liaison Services (AERLS) and ADPs through visits, regular radio and television programmes, printed materials like pamphlets, posters and bulletins as well as farmers' training programmes. However, there seems to be indications of limited adoption of these technologies by the peasant farmers in Iwo Local Government Area of Osun state. This problem calls for attention, in view of the importance of cowpea in the people's diet.

1.1 The Problem Statement

Leguminous grains especially cowpea are a common component of people's diet all over the world. The amount of the grains consumed varies in different countries but higher consumption is apparently associated with relatively low per capital income countries (FAO, 1978).

However, despite its importance, cowpea production technologies are still not adopted by majority of the farmers

in Iwo Local Government Area of Osun State. The main concern of this thesis is therefore to examine the socio-economic factors of farmers which are associated with the adoption or non adoption of these technologies in the area.

The major research questions for this study are: What are the socio-economic characteristics of the farmers in the study area? To what extent are the people in the area aware of cowpea production technologies? To what extent have they adopted the recommended cowpea production technologies in the area? How do the socio-economic factors relate to the people's adoption or non adoption of these technologies?

As far as Iwo Local Government Area is concerned, there has not been much, if any systematic and scientific investigation of these questions. It is therefore the purpose of this thesis to seek answers to these research questions.

The failure of a great many farmers to adopt the cowpea production technologies may probably be less to do with their traditionalism than their disadvantaged condition. It is from this perspective that this study has been designed to really determine the awareness and adoption levels of farmers in the study area with regard to the recommended cowpea production technologies and some of the factors affecting their adoption or rejection of the practices. It is presumed that the

development and diffusion to farmers of new and improved agricultural technologies are central to the transformation of Nigeria's peasant and traditional agriculture into a modern one capable of eliminating the present inadequacies in the country's food production.

1.2 Objectives of the Study

The broad objective of this study is to analyse the various factors affecting farmers' adoption of cowpea production technologies in Iwo Local Government Area of Osun State. The specific objectives of the study are to:

i. identify the socio-economic characteristics of the farmers in the study area;
ii. determine the level of farmers' awareness and adoption of recommended cowpea production technologies;
iii. determine the factors related to farmers' adoption of cowpea production technologies; and
iv. draw conclusions from the findings and make recommendations on how to improve on the existing level of adoption of recommended cowpea production technologies in the area.

1.3 Justification of the Study.

The greatest challenge facing Nigeria since independence is to produce enough food for the rapidly increasing population. While the annual rate of population growth in

Nigeria is estimated at between 2.5 and 3.0 percent, that of food production is between 1.0 and 1.5 percent (Williams *et al*., 1990). Nigeria, after about three decades of experience with an apparently improved extension service and personnel, a vigorous agricultural research programme and massive resource investments in rural development projects, has still not attained the goals and objectives of strong economic and social development in the agricultural sector. What then are the problems responsible for this situation?

According to most observers in and outside agriculture, the major problems apparently are the lag in the diffusion of recommended agricultural practices and the apparently slow adoption or complete rejection of the practices by the estimated 13 million peasant farmers in Nigeria who are primarily responsible for the country's food production (Arokoyo, 1981).

It is hoped that this study would greatly improve our knowledge of the farmers' behaviour and problems regarding the adoption or non adoption of recommended agricultural innovations developed by research stations and extended by the extension agents. This is especially important since agriculture and rural development in Nigeria depend to a great extent on the degree to which the ordinary farmers are able and willing to incorporate research findings into their

farming practices.

This study would also serve as a useful feed back for both the research stations which developed the practices and the extension agents which are responsible for their dissemination. The feedback would provide a more rational basis for determining research priorities at the research stations and in selecting more practical, effective and efficient communication channel by extension workers. Furthermore, it would give the extension workers some useful ideas about which practices are more likely to be readily accepted by farmers.

Useful and important information would also be provided in this study for the official of the states' Ministry of Agriculture who are responsible for planning agricultural projects and delivery services to farmers. Considered to be especially important in this regard, is knowledge of farmers' perception of their involvement in extension programming and the relevance of the recommended practices they are expected to adopt. A thorough knowledge and understanding of the farmers' constraints and factors motivating their adoption of modern agricultural technologies, are crucial in formulating policies and planning for both short and long term agricultural development projects which are relevant to local needs.

Furthermore, this study is viewed as also important for other governmental agencies involved in rural development, the mass media and agribusiness, all of whom have very vital roles to play in the development of Nigeria's agricultural sector. Overall, it is hoped that this study would contribute in some ways to the gigantic task of reversing the country's present decline in food production through modernization and expansion.

CHAPTER TWO

2.0 REVIEW OF LITERATURE AND THEORETICAL FRAMEWORK

2.1 Review of Related Literature.

The central theme of this study is to study the socio-economic factors affecting the adoption of cowpea production technologies among farmers in Iwo Local Government Area of Osun State. In this chapter, an attempt was made to review the appropriate literature on the adoption and diffusion studies conducted in Nigeria and elsewhere which are thought to have particular relevance and applicability to the present study.

There has been quite a number of diffusion and adoption studies undertaken in various countries of the world, however, the studies of adoption behaviour of farmers in Africa are limited (Jagne and Patel, 1981). Adoption can be viewed as the mental process which an individual passes through in deciding to use an innovation (Onyenwaku and Mbuba, 1991). According to Jagne and Patel (1981), the process of adoption comprises five stages: awareness, interest, trial, evaluation and adoption. Much of the expected development in agriculture depend on the adoption and diffusion of agricultural innovations (Adefuye and Adedoyin, 1993).

Efforts in diffusion and adoption studies have largely been concentrated in finding whether there exists any

relationship, and to what extent, between the adoption of innovations and its characteristics and the personal characteristics of the adopters and other socio-cultural and economic variables. For example, studies by Voh (1979), Atala (1980) and many others have shown that personal characteristics of the farmers (e.g. age, level of education, size of farm etc) are related to the adoption behaviour of farmers.

2.1.1 Personal Characteristics of Farmers and Adoption.

The personal characteristics of farmers that affect their decisions on adoption have largely been found to include age, farm size, family size, mental flexibility, farm ownership, practicing of subsidiary occupation, participation in voluntary organization, level of education, awareness of recommended practices, frequency of agents contact with farmers, social status, level of living, exposure to mass communication and other socio-economic factors. In Nigeria, many researchers have investigated factors related to the adoption of improved farm practices. For example, Atala (1984) in his research on the relationship of socio-economic factors in agricultural innovations and utilization of information sources in two Nigerian villages using age, formal education, literacy, cosmopolitans, social participation and level of living, found that there is a relationship between socio-economic characteristics of farmers and their adoption

of agricultural innovations.

Also, Voh (1980) in his study of factors associated with the adoption of recommended farm practices in a Nigerian village reported that the variables of level of literacy and education, contact with extension and urban centres, socio-economic status, empathy and leadership roles in agricultural matters are significantly related to the adoption of recommended farm practices. In a related development, Onyenwaku and Mbuba (1991), discovered in their study of the adoption of the seed yam miniset multiplication technique by farmers in Anambra State that profitability was the major reason for adoption while lack of awareness of the technique was the most limiting factor to its adoption. The study also showed that labour availability, frequency of attendance at farmers' meetings and extension contact are positively and significantly associated with the adoption of the minisett technique while farm size was negatively but significantly related with the intensity of adoption.

In line with the above, Erasmus and Omole (1983), in their research on the adoption of recommended farm practices by Nigerian cocoa farmers, found that farmers are more likely to adopt the recommendations associated with the establishment of new cocoa farms than those associated with maintenance and harvesting of cocoa. This, according to them is due to the

fact that the recommendations associated with the establishment of new farms fall within the normal work of the farmer, hence, he can perform the work himself. Secondly, since most of these recommendations do not require additional inputs, the question of finance is minimal. They also noted that the farmer's decision to adopt a particular innovation is influenced by the profitability of the innovation, whether part of his meagre resources could be diverted into adopting the new practice and the compatibility of the innovation with the existing farm practices.

Laogun (1993) in his evaluation of university based extension system, discovered that income level, family size, social participation, extension contact, number of information sources used on introduced improved practices and extent of awareness of university based extension programme were significantly related to the adoption of recommended improved farm practices. In his own analysis of farmers characteristics associated with the adoption of soil management innovations in Ikorodu Local Government Area of Lagos State, Agbamu (1993) found that farmers' knowledge of the innovations made predominant contribution to adoption level while contact with extension agents made significant contribution towards adoption with a negative regression coefficient.

In the same vein, Adefuye and Adedoyin (1993), in their research on adoption rate, found that the non-contact farmers are not getting the extension message as expected to be delivered to them by the contact farmers. According to them, the amount of resources devoted to the contact farmer strategy is not justified in the present form in view of the fact that only 8.3% of non-contact farmers have benefitted from the use of the strategy and there are no differences in the number of innovations used by both contact and non contact farmers as revealed in their study. All farmers should therefore be afforded the opportunity to get their information directly from the Village Extension Agent (VEAs).

Information is very vital to any technology acceptance, approval and adoption. However, for a technology as complex and important as alley farming, farmers final utilization of it depends on whether extensionist get enough information since they are more or less the "Gospel preachers" of technology. Igodan and Jabar (1993) in their own research on the perception and attitude of researchers and extensionists Towards Alley Farming Technology in South West of Nigeria found that the more knowledgeable the individual, the more likely there was a favorable attitude towards the technology.

Also, Ikejimba and Alabi (1992), in their study of the impact of work groups on agricultural technology adoption,

discovered that farmers are organized in group, usually of the same sex, to help one another in farm operations, create awareness of innovations, purchase of farm inputs and aversion of risk in some of the new agricultural technologies being adopted. According to them, the work groups are good sources of agricultural information and creation of awareness of new farming practices. Also, the work groups enhanced sustainability of the farming systems of resource poor farmers by making possible cost reductions in crop production and technology adoption.

Atala, et al., (1992), in their study of the impact of the Training and Visit (T & V) system of extension on adoption of farm innovations and farm output in Kaduna State found that the most important variables which influenced adoption were extension contact, farm size and hired labour while those for gross farm output were farm size, hired labour and non farm income. Similarly, Auta, et al., (1992), in their study of socio spartial variation in the adoption of agricultural innovations in selected villages in Funtua and Jema'a Local Government Area, pointed out that age and accessibility were important factors influencing the adoption of innovations. On the other hand, according to them, literacy level and house hold size were insignificant.

In the same vein, Jagne and Patel (1981) in their

research on adoption of the individual and package of improved practices by package and non package groundnut farmers in the Gambia discovered that a large percentage of package farmers had adopted the individual practices in the package and the package of practices as a whole than the non package farmers. This according to them implies that the groundnut package programme has made a significant contribution to the adoption of the practices in general. A relatively smaller percentage of package and non package farmers adopted chemical fertilizer and chemical seed dressing. Only 8 and 2% of package and non package farmers respectively, adopted all the eight improved practices as a package. These low percentages might be due to the perception of the farmers on some of the practices. The farmers might be thinking that some of the package recommendations are not sound technically in relation to the soil type, climatic conditions and other factors.

The success of agrarian revolution in any developing country will depend to a large extent on the quality of that country's extension staff, the priority given to agriculture in terms of research, government price policy, farmers ability to respond to some economic incentives and the availability of infrastructural facilities essential for effective extension work. In Nigeria today, much emphasis has been placed on the training needs of change agents to ensure that farmers reap the fruit of science and technology. In view of this, Osuji

(1983), in his study of the institutional factors associated with adoption of new farm technologies among farmers in Eastern Nigeria revealed that the ability of farmers to adopt new farm practices depend on their financial position, nearness to extension personnel and availability of incentives both to the extension personnel as well as the farmers.

Furthermore, research findings on adoption of innovation reveal that one of the inhibitors or incentives to innovation adoption is the socio-cultural factors. The Nigerian farmer is surrounded by many deep rooted social and cultural factors which could hinder him from adopting modern technologies; the most important here being land tenure system. Williams' (1978) studies confirm that people who do not possess land were among the non adopters of improved agricultural technologies. Expressing the same view, Tiver (1978) observed that the problem of planting improved grasses and legumes lies not only in the expansiveness of bush clearing and seed bed preparation, among other things, but also in the ability of the target group to possess land. Another socio-cultural factor is the village/family structure. In most traditional house holds, decisions come from the house hold head, who acts as both legal and political spokesman on all matters (Awogbade 1981). His decisions are capable of influencing them and therefore might dictate either to adopt an innovation or not. The effect of this structural arrangement is seen in Williams'

study (1978) where villagers refused an innovation since no one in the village did so.

Other studies carried out on adoption try to relate personal and socio-economic-characteristics of the farmers to adoption. Basu (1968), in his study of four villages in the former Western State, found that size of farm, ownerships and full time occupation were important factors associated with adoption of farm practices.

Mosher (1971), upholds that education, credit facilities, membership of associations and cooperations affect adoption. Alao (1971) found family size, exposure to mass media, participation in voluntary organizations, cosmopolitans, farm size and level of awareness to be positively and significantly associated with farmers adoption.

In the same vein, Clark and Akinbode (1968) found high adoption to be significantly correlated with size of farm, value of farm product sold and size of family. Lionberger (1960) in his own study affirmed that social factors such as neighbours, community family social cliques, cultural factors such as values and attitudes, personal factors including age, education, psychological characteristics and situational factors including farm size, farm income, social status, community prestige are among forces that encourage or discourage adoption.

2.1.2 Farmers and Response to Change

The behaviour of the peasant farmer and his attitude to change has for long been the subject of intensive study by sociologists all over the world. In Nigeria, as well as in other developing countries, studies have been undertaken with a view to finding what factors are responsible for motivating the peasant farmers to readily accept and adopt certain innovation and to reject others even when such innovations appear to be superior to the farmers' age-long practices. Isolated variables include:

- Characteristics of the farmers (age, education, social and tenural status).
- Characteristics of the farm (agroclimatic location, farm size, credit etc.)
- Characteristics of the innovation itself (relative advantage, compatibility, complexity, divisibility and communicability).
- Characteristics of the change agents themselves (personal characteristics, techniques of communication, amount of participation obtained and use of traditional culture (Onyenwaku and Mbuba, 1991).

The peasant farmers all over the world have often been described in such negative terms as being conservative, illiterate, resistant to change etc. The Nigerian farmers are no exception. For example, Onazi (1973) pointed out that the farmers have often been accused of being too conservative,

illiterate, culturally oriented and unwilling to accept change. Similarly, Zaria (1984) observed that the Nigerian farmer has been portrayed as a highly conservative person, resistant to change and lacking in innovation.

On the other hand, there are quite a number of researchers who see the Nigerian farmer in a positive light. Edache (1980) for example asserts that the Nigerian farmers are by nature not resistant to change per se and that they appear unresponsive to new ideas only when the social, economic and physical environment in which they operate dictate it.

Jones (1960) considers the Nigerian farmer as a rational economic man. This view was shared by Agbonifo (1974) who believes that the farmer is prepared to accept innovations provided he is sure he can earn more money by doing so.

A review of the literature on diffusion of innovation research yields a number of generalizations. One of the conclusions according to Erasmus and Omole (1993) is that there is differential adoption rate among members of a social system. A new idea is initially adopted by a very small but highly innovative group. These individuals are able to take the necessary risk because of their high economic status. From these innovators, those with high social and leadership

learn and adopt the new idea. The new idea then spreads throughout the social system until most of the members of the system adopt it.

2.1.3 Reasons for Farmers' Rejection of Innovations.

From his experience, Byrnes (1972) was able to deduce that farmers, by and large resist some changes due to some failure of the extension system itself. He contends that more frequently, what the farmers seem to resist is not the change itself but the manner in which the change is presented or what they perceive the change to be.

Most often, the farmers may reject the innovations because such innovations are inappropriate or unrelated to their problems and needs. For example, in Nigeria, some research recommendations have been rejected by farmers simply because such recommendations run counter to their traditional system or may have economic implication or some other limitations that make it difficult for them to adopt the new innovations. Among the many reasons advanced by researchers for farmers resisting some innovations are lack of available resources, the seen and proven ineffectiveness of the practices, lack of anything to gain from the change, fear of risks and uncertainties, fear of the consequences, desire to preserve traditional ways and general unwillingness to change (Byrnes, 1968).

In Nigeria, the various reasons advanced for non adoption by farmers include among others, non availability of inputs at the right time, non profitability, lack of knowledge of the recommended practices, lack of suitable market for the products, lack of capital resources and many more. For example, Edache (1978) found that one fifth of farmers in Kano rejected close spacing of the new sorghum variety because of several reasons: lack of information or knowledge of the practice; difficulty in measuring the spacing and problems associated generally with inter-cropping in fields so closely spaced.

In his adoption studies of Minna Division, Gana (1974) also found a number of reasons responsible for farmers' failing to adopt recommended farm practices. The most important reasons for non adoption included inadequate farmers extension worker contact; uncooperative attitude of farmers, delay in receipt of materials and supplies; lack of capital to purchase inputs, no confidence or faith in recommended practices, unpreparedness to give up old ways, lack of sufficient knowledge of new practices, low level of education, non participation in extension activities and failure of some demonstration plots and other extension programmes.

2.14 Reasons for Farmers Acceptance of Innovations

The acceptability by farmers of new improved farm

practices depend on many factors such as the attitude of the farmers to the extension worker and his messages, the validity of the message, the complexity of the message and the compatibility of the message with the existing farmers' practice (Williams, 1978). Hundreds of adoption studies have shown a consistent trend that five major characteristics of innovations as perceived by potential adopters affect the acceptability of such innovations.

1. Relative advantage
2. Complexity
3. Compatibility
4. Trialability
5. Observability (Rogers and Shoemaker, 1971).

Relative Advantage

When the farmer perceives the change as better than the idea he has been using before, he is most likely to adopt it. The greater the relative advantage of the new practice, the quicker its chance of being adopted. The relative advantage of a new idea, as perceived by members of a social system is positively related to its rate of adoption.

Complexity

If the farmer perceives an innovation as being difficult to understand and use, he is most likely to reject it. According to Rogers and Shoemaker (1971), "the complexity of

an innovation as perceived by members of a social system is negatively related to its rate of adoption".

Compatibility

If the new practice is perceived by the farmer as being consistent with his existing values, past experience and needs, it stands a much better chance of being adopted. The more compatible a practice is with the existing farming operations, the more likely it will be adopted quickly and vice versa. It has been stated that the compatibility of a new idea as perceived by members of a social system is positively related to its rate of adoption (Rogers and Shoemaker, 1971).

Trialability:

If the farmer can try the idea instalmentally, he is more likely, to adopt it more quickly than if it were indivisible. The trialability of an innovation as perceived by members of a social system is positively related to its rate of adoption.

Observability

When the farmer is able to observe the result of the innovation, he is more likely to adopt it. The observability of an innovation as perceived by members of a social system is positively related to its rate of adoption.

2.1.5 Extension Workers' Characteristics and Adoption.

Not all the variables leading to the farmers' decision to adopt or reject innovations could be attributed to the farmers and/or the extension organisation alone. Some factors affecting the success or failure of the extension programme may rest squarely on the extension worker himself. The extension worker carries with him to his job several attributes such as the quality of his training, his attitudes and motivations, his social network of relationships (Alao, 1971). Other characteristics of the extension worker that contribute to the effectiveness of his job include, among others, credibility, knowledgeability, mobility and positive attitude to work.

Byrnes (1972) stresses credibility as being highly essential for the success of an extension agent. Fett (1974), pointed out the fact that messages are judged and accepted not only on the bases of their content but also on the credibility of their source. Hoveland (1953) postulated that "trustworthiness" and "expertness" are the two principal dimensions of source credibility. One very important factor that sometimes vitiates the Nigerian extension workers credibility in the eyes of their clients is their inability to keep their promises to the farmers (Williams, 1978). Quite often, the fertilizer and seeds do not arrive on time thus making the farmer to lose confidence in the extension worker

as well as the government.

In his study of factors associated with farmers' resistance to change in Asia, Byrnes (1972) found that the farmers resisted because of the perceived or actual technical inadequacies of the agent. According to him, many agents, did not have farm background and possessed only a book or garden knowledge of farming. In line with the above, Onazi, (1973) pointed out the fact that in Nigeria, the hard core extension service is manned by people who by training and technical skills are at the very bottom of the extension organization and are the least trained for their important job. Most of them are young and therefore incapable of grasping the complexity of agricultural technology, let alone transfer same to farmers. There must be a substantial knowledge gap between the extension worker and his client or else the extension worker would have little or no credibility.

One other problem that renders the Nigerian extension worker less effective is excessive work load. The village level extension workers have the onerous task of executing many activities in their extension areas. According to Onazi (1973), the extension workers combine many duties such as organizing farmers council meeting (FC), Rural Youth Organization (YFC), organizing and conducting method and result demonstration and farm tours as well as field days.

They are also responsible for management and supervision of farm centres and maintain seed multiplication and supply services. They are also responsible for conducting field experiments for research workers of the universities and for collecting crop data and meteorological reports. The involvement of the village level extension worker in all these activities tend to render him less effective in his duties. Consequently, these make them lack credibility which in turn negatively affect adoption of farm technologies.

2.2 Theoretical Framework

In view of the related literature reviewed, the framework upon which the present study would be based, it is assumed that the Nigerian farmers in general and the farmers in the study area in particular are capable of and willing to embrace new recommended farming practices provided such new practices are profitable and are compatible with their existing farming practices and do conform with their norms and values. In order to fully appreciate and understand the review, it is pertinent, at this juncture, to briefly examine the diffusion adoption theory upon which this work is based. The diffusion and adoption of an innovation according to Arokoyo (1981) is a multi-disciplinary theory of planned social change which is brought about by the spread of new ideas, practices or technologies throughout a social system. The classical diffusion adoption theory is made up of two components:

- the diffusion process and
- the adoption or innovative decision process.

According to Atala (1980), the distinction made between adoption and diffusion concept is that adoption is a concept which refers to the acceptance of an idea, practice or product by a single unit of a potential audience. Diffusion, on the other hand, is a concept which refers to the spread of an idea, practice or product through the whole of the potential audience, market or social system. Within the paradigm of innovation - diffusion, prevailing social structure reveals that the rural populace yearns for relevant information to improve their lot (Olowu & Yahaya, 1993). The diffusion of innovation perspective assumes that the acquisition of knowledge is the basic process of agricultural modernization. It also assumes that peasant conservatism is a product of traditional rural value system. It is, however, good to point out that if farmers do not adopt agricultural innovations, it is not simply because of their traditional rural value systems. One major reason is because of their socio-economic characteristics which do not facilitate the adoption of the agricultural innovations.

As reviewed in the literature cited earlier on, there have been many studies which focus on both the adoption and diffusion of new ideas, practices and products that have been

made available to various segments of society for many years by businesses, government agencies and several other groups. Nearly half of these studies have been concerned with the diffusion of agricultural innovations (Atala, 1980). Socio-economic factors that relate to adoption or non adoption of farm innovations are many and varied. But essentially, they include farm income, size of farm, tenural status, community prestige, source of farm information used, level of living and complexity of the practice or change involved (Atala, 1980).

In the southern parts of the country, there have been some studies which demonstrate the relationship between farmers characteristics and adoption behaviour. For instance, Osuji (1983), Agbamu (1993), Basu (1969), and Clark and Akinbode, (1969), discovered that high adoption was significantly correlated with socio-economic characteristics of farmers. However, there have not been many systematic and documented scientific studies of the relationship between these factors and adoption of new farm innovations especially that of cowpea production technologies in Iwo Local Government Area of Osun State.

Based on these findings and with the researchers understanding that adoption behaviour is being influenced by a number of factors such as personal characteristics and situational variables, among other things, the following

variables were considered for the purpose of this study: age, level of formal education, labour availability, years of farming experience, membership of cooperative or farmers' association, farm size, tenural status, frequency of extension contact, credit availability and practicing of subsidiary occupation. These variables were selected because they have been found in other studies to be significantly related to adoption and it would be interesting to see the result in the study area.

2.3 Hypothesis

There is a relationship between the socio-economic characteristics of farmers and adoption of recommended cowpea production technologies.

CHAPTER THREE

3.0 METHODOLOGY

3.1 The Study Area

The study area is Iwo Local Government Area of Osun State. Iwo town is the headquarters of the Local Government. It is also the headquarters of the Osun State Agricultural Development Project (OSSADEP). Important villages within the Local Government Area are Ogburo, Papa, Agoro, Oloba, Olori, Odoori, Jolu/Foke, Olabiwonnu, Idi Iroko and Idi Araba.

The climate in these areas follows the normal tropical rain forest pattern. The monthly rainfall, the daily temperature and the relative humidity vary from one season to another. For instance, an average monthly rainfall of about 254 mm is often recorded during the month of July while the rainfall in December or January is as low as 25-40 mm or even less. The hottest months of the year are February and March with the average mean temperature usually at 30°C. The coldest months are August and September with the average mean temperature usually at 22°C.

The soils are rich enough to support and sustain luxuriant growth of trees. Crops grown in the areas include maize, yam, cassava, vegetables and tree crops such as cocoa, citrus and kolanuts. Majority of the farmers are small scale food producers with an average holding of one hectare of

scattered plots.

3.2 Socio-Economic Characteristics of the People in the Area

The people in Iwo Local Government Area of Osun State enjoy a high degree of social, religious and language homogeneity. Over 70% of the people in the area are engaged in agricultural production.

The farmers in the area have access to improved package of agricultural technologies disseminated by the Osun State Agricultural Development Project through their various agents. Also, farmers in the area belong to cooperative societies and other types of farmers' associations. This is a good source of agricultural information.

Traditionally, land belongs to the king who is the traditional ruler of the place. Any individual wishing to use the land does so with the permission of the king. However, land acquired either through inheritance, gift, purchase, pledge or loan are treated as private properties. Each farmer owns several separate plots of land with average holdings of about one hectare.

3.3 Sampling Procedure

According to the provisional result of 1991 population census, the population of Iwo Local Government was 105,951 with 50,320 males and 55,631 females. The sampling method used for this research was both purposive and simple random sampling. Purposive sampling was used in selecting the study village. This was done in order to identify the village with relatively high concentration of cowpea production. The village that was finally selected and used for the research was Oloba. Simple random sampling technique was, however, used in selecting the farmers interviewed.

The population of the farmers in Oloba village, according to the Osun State Agricultural Development Project office, was estimated at 500. Houses were numbered and these numbers were randomly selected using simple random sampling technique. The numbers were, at each time of selection thoroughly mixed before selection was done and each time one was selected, it was enlisted for interview and thrown out. Heads of households of the selected houses were used for the research. Using this method, 20% of the farmers' was thus chosen. Thus, a total of 103 household heads provided data for this study.

Interview schedules were administered with the assistance of four enumerators from the Osun State Agricultural Development Project office. In a few cases, the enumerators

had to translate questions into the local language for easy understanding by the respondents. Information were collected on the personal, socio-economic as well as farm and farming characteristics of the farmers in the area.

3.4 The Technology Package

Considerable improvement in cowpea yield (ranging between 1,500 and 2,000 kg/ha) had been recorded on research farms where pest control measures were carefully carried out on sole cowpea crops (Voh and Chuke, 1983). Discussions with the Osun State Agricultural Development Project workers and the people in the study area revealed the practices to which farmers in the area had been exposed in general. According to them, in the 1994/95 cropping season, six cowpea production technologies were introduced to the farmers in the area. These technologies include:

i. Use of improved cowpea seed - Ife brown.
ii. Fertilizer application especially single superphosphate.
iii. Recommended planting time for cowpea (August/September)
iv. Recommended spacing for cowpea (20 x 20 cm)
v. Use of insecticides (cymbush and rogor)
vi. Use of fungicide (Benlate).

Therefore, respondents were questioned on the above practices.

3.5 Statistical Analysis

Descriptive statistics such as means, percentages, frequency distribution and Pearson Product Moment Correlation Coefficient as well as stepwise regression analysis were used. Percentages and means were used to report the demographic and farm characteristics of the respondents. Percentages were also used to report the extent of awareness and adoption of recommended cowpea production technologies.

Pearson Product Moment Correlation Coefficient provides a means of determining the existence and strength of relationship between pairs of variables. It should, however, be noted that although, there may be many reasons for a relationship, the correlation coefficient does not necessarily indicate a cause and effect relationship but rather it indicates whether or not there is a relationship between the two variables and if there is, whether the relationship is positive or negative. Thus here, the correlation analysis was used to determine the degree of relationship between the dependent and independent variables.

The stepwise regression analysis was used to test the contribution of each variable and allow for a more predictive analysis. Ninety five percent level of probability was used to report the significance of the relationship between adoption and the selected independent variables.

3.6 Operationalization of Variables.

In this section, an attempt was made to define the various variables investigated and to state how they have been measured in the study.

Age:

Age is an important determinant of seniority among traditional societies. In Nigeria, the aged and the elderly persons hold a special position of leadership, prestige, respect and reverence among their communities. As such, age may play a significant role in the decision making process in the adoption of new farm practices in the study area. In this study, the variable was measured by the age, in years, given by the respondent at the time of the study. Responses were later grouped in to categories with 21-30 years receiving a score of 1; 31-40 years, a score of 2; 41-50, a score of 3; 51-60, a score of 4 and 61 and above, a score of 5.

Level of Formal Education

This refers to the type of education acquired through the regular or formal attendance of schools and colleges. Level of education was measured by asking the respondents to state the highest type of formal education they have, whether primary school, secondary school, teachers college or university and other kinds of educational institution. The variable was scored as follows: those who never attend school

had a score of zero; those who had primary education had a score of 1; those who had secondary education or its equivalent like teachers training colleges had a score of 2; those who attended higher secondary school like Nigeria Certificate in Education, Nursing School or diploma courses had a score of 3 and finally, those who had university education had a score of 4. Thus, scores on this variable range from 0 to 4.

Tenural Status

This was measured using the system an individual farmer used in acquiring the land on which he was presently farming. The various land acquisition methods recorded are leasing, rent, inheritance, purchasing and government will. These methods were scored 1, 2, 3, 4 and 5 respectively.

Practicing of Additional Occupation

This is defined as the subsidiary occupation claimed to be engaged in by a respondent. Because of the seasonality of farming in the study area (due to lack of irrigation system), most farmers tend to engage themselves in other off farm or subsidiary occupation. This variable was measured by asking respondents to state their major occupation as well as their subsidiary occupation. The responses gotten were scored as follow: farming and government work had a score of 1, farming

and trading had a score of 2; farming and apprenticeship like tailoring, barbing etc had a score of 3 while farming only had a score of 4.

Farm Size

Is defined as the size of land holding an individual farmer was farming. It is usually measured in hectares. This variable was measured by considering the number of acre a particular farmer reported he was using for food crops during the research period. Acre was used because farmers in the study area are more used to it. The number of acre given by individual respondents was later converted to hectares. Responses gotten were scored as follow: farmers farming a piece of land below one hectare had a score of 1; those farming between one and two hectares had a score of 2, while those farming above to hectares had a score of 3.

Years of Farming Experience

This was measured by considering the number of years an individual respondent had been farming on his own. Years of farming experience recorded were grouped and scored as follow: those respondents having between one and three years experience had a score of 1; those having between four and six years experience in farming had a score of 2; those having between seven and nine years experience had a score of 3; those with experience between ten and twelve years had a score

of 4; those respondents with between thirteen and fifteen years of experience had a score of 5; while those having above sixteen years of experience were scored 6.

Labour Availability

This was measured by asking the farmers whether they usually get the required labour necessary for working their cowpea farm or not. Base on their responses, we have the following and were scored accordingly. No opinion had a score of zero; no had a score of 1 and yes had a score of 2.

Frequency of Extension contact

In this study, the variable refers to the act whereby the extension worker and the farmer meet either at individual respondent's home, farm or extension workers office for advice on new farming practices. This variable was measured by asking the respondents to state how often they usually see the extension agent in their area. The responses gotten include;

i. I have never seen one
ii. I see them once in a year (seldom)
iii. I see them once in 2 or 3 months (occasionally)
iv. I see them once or twice in a month (very often)

These responses were scored 0, 1, 2, and 3, respectively.

Membership of Cooperative Society or Farmers Organization

This variable was measured by asking the respondent to

state the type of organization he belongs. The responses gotten were used in grouping and scoring them as follow: those that had no organization ha a score of zero; those who belong to thrift and credit cooperative society had a score of 1; those that belong to religious or social organization had a score of 2; those in Young Farmers Club (YEC) had a score of 3, while respondents belonging to the farmers cooperative society had a score of 4.

Credit Availability

This variable was measured by asking the farmers whether credit is readily available to them in the area or not. Responses gotten were scored as follow: "No opinion" had a score of zero; "No" had a score of 1, while "Yes" had a score of 2.

CHAPTER FOUR

4.0 FINDINGS AND DISCUSSION

4.1 Socio-Economic Characteristics of Farmers Studied

The first objective of this study was to identify the socio-economic characteristics of the farmers in Iwo Local Government Area of Osun State. Table 8 through 19 (Appendix B) show the socio-economic characteristics of farmers in the area. It was found that farming was the primary occupation of the respondents. However, more than two thirds (60%) of them reported practicing some other occupations. These additional occupations include petty trading, apprenticeship like tailoring, barbing, civil service work etc. About one third (31%) of the respondents had farming as their only occupation. More than one third (44%) combined farming with civil service work while others combined farming with either trading or apprenticeship. The high percentage of respondents combining farming with civil service work may not be unconnected with the level of education of people in the area which afforded them the opportunity of being employed into white collar jobs.

The majority (52%) of the farmers were found to be between 51 and 60 years old. The mean age of the respondents was 51 years which is a little higher than the finding of Voh (1979) and Arokoyo (1981). Apparently, there were less young people entering farming than in the past.

As expected, the majority (78%) of the respondents were literate who had one form of formal education or the other. The frequency distribution of respondents according to their levels of formal education is presented in Table 9. This is however contrary to the findings of Voh (1979) who discovered that well over three quarters of Giwa farmers had never attended school. Also, Clark and Akinobode (1968) found more than half of their study group in the Western State of Nigeria without any formal schooling. It is significant to point out that only 22% of the respondents in this study had never attended school.

Only a few (28%) of the farmers in the study area belonged to cooperative or farmers' organization. About half of the respondents (56%) indicated that they had never seen an extension officer before. The frequency of extension workers to farms was about once in a year on the average. Very few farmers (23%) indicated they obtained loan from either the bank or the government to carry out their farming operations.

Farmers in the area cultivated about 2 ha of land on the average. The small farm size farmers cultivated may not be unconnected with the fact that most of their farms were used for planting tree crops like citrus, cocoa, mango and kolanut.

In summary, Iwo Local Government Areas peasant farmers were typically full time farmers, about 51 years old. They

were literate with an average farm size of 2 ha and they owned their land directly through inheritance as well as purchase.

4.2 Awareness and Adoption of Recommended Cowpea Production Technologies.

The second objective of this study was to determine knowledge of the level of farmers' awareness and the extent to which they had adopted the recommended cowpea production technologies. the extent of awareness, by farmers, of these technologies is presented in Table 1 while Table 2 shows the extent of their adoption of the technologies.

Table 1: **The Extent of Farmers Awareness of Cowpea Production Technologies in Iwo Local Government Area of Osun State.**

Recommended Technologies	No. of Farmers' that are aware of the technologies (n = 103)	%
Use of insecticide	75	72.8
Improved cowpea seeds	73	70.9
Planting time	64	62.1
Spacing	41	30.8
Fertilizer application	32	31.1
Use of fungicide	24	23.3

It was discovered that about half (50%) of farmers in the area were aware of the recommended technologies. The use of insecticide recorded the largest percentage (73%) of farmers awareness while the use of fungicide recorded the lowest

percentage (23%) of farmers awareness of the technologies.

Also, it was observed that the adoption behaviour of farmers in the area followed a fairly close pattern to the respondents knowledge level or awareness of the technologies. In all cases, certain respondents had heard of and were using some of the production technologies. The adoption of the use of fungicide (13%) is still considered to be the lowest while the use of recommended planting time for cowpea recorded the highest percentage (44%) of farmers adoption. On average, it was discovered that less than one third (30%)of the farmers adopted most of the production technologies. This is considered quite low when compared with their awareness level (50%) of the technologies.

Table 2: **The Extent of Farmers' Adoption of Cowpea Production Technologies in Iwo Local Government Area of Osun State.**

Recommended Technologies	No. of Farmers' that adopted the technologies (n = 103)	%
Planting time	45	43.7
Use of insecticide	43	41.7
Improved cowpea seeds	38	36.9
Spacing	30	29.1
Fertilizer application	19	18.4
Use of fungicide	13	12.6

This study provided data which indicate that farmers in Iwo Local Government Area of Osun State had a moderate degree (50%) of awareness of the six recommended cowpea production

technologies. However, their adoption level (30%) was found to be relatively low. The data showed that there was a substantial gap between awareness and adoption of the technologies. Onyenwaku and Mbuba (1991), Voh (1979), Atala (1980) and Zaria (1984) observed a similar gap between awareness and adoption of farm practices among farmers.

Table 3: **Gap between Awareness and Adoption of Recommended Cowpea Production Technologies in Iwo Local Government Area of Osun State.**

Recommended Technologies	Awareness (%)	Adoption (%)	Differential (%)
Use of insecticide	72.8	41.7	31.1
Improved cowpea seeds	70.9	36.9	34
Planting time	62.1	43.7	18.4
Spacing	30.8	29.1	10.7
Fertilizer application	31.1	18.4	12.7
Use of fungicide	23.3	12.6	10.7

4.3 Farmers' Reasons for Adoption or Rejection of Recommended Cowpea Production Technologies in Iwo Local Government Area of Osun State.

Farmers gave different reasons for adopting or rejecting different practices. The data showed that the highest proportion (36%) of respondents who adopted the practices did so to obtain high yields. This is the same conclusion arrived at by Voh (1979) in his study of Giwa farmers. The findings further showed that successful use of a practice by one farme-

may influence another to adopt same. According to the farmers, about 10% of the adopters of the technologies did so because they saw other farmers succeeding with it. This would mean that in an attempt to make farmers use new ideas, care should be taken to see that those who are first approached adopt the practices successfully.

On the other hand, farmers did not adopt some of the practices either because of their lack of awareness of the technologies, lack of interest or unavailability of inputs at the right time. Alao (1971) lend support to this finding. *More than one third (38%) of the respondents who did not adopt* maintained that they did not adopt because they were not aware of the technologies. About one third (31%) claimed lack of interest in the innovations while 10% of the non adopters complained of unavailability of inputs. Others mentioned the difficulty in mastering the innovation, lack of credit facilities and high cost of chemicals. Farmers' responses on why they adopted or did not adopt are summarized on the Tables 4 and 5 below.

Table 4: **Distribution of Farmers According to Their Reasons for not Adopting the Recommended Cowpea Production Technologies.**

Reasons for Non-adoption	No. of Respondents	%
Lack of awareness	39	37.8
Not interested in the innovation	32	31.1
No opinion	17	16.5
Inputs not always available	10	9.7
Lack of Credit facilities	2	1.9
Innovation knowledge difficult to master	2	1.9
High cost of chemicals	1	1.0
Total	103	100

Table 5: **Distribution of Farmers According to Their Reasons for Adopting the Recommended Cowpea Production Technologies.**

Reasons for Adoption	No. of Respondents	%
It gives high yield	37	35.9
Seen other farmers succeeding	10	9.7
Resistance to pest and diseases	6	5.8
Increases income of farmers	1	1.0
No opinion	49	47.6
Total	103	100

4.4 Correlation of Factors Associated with The Adoption of Recommended Cowpea Production Technologies in Iwo Local Government Area of Osun State.

The third objective of this study was to determine the relationships between selected socio-economic characteristics of farmers and their adoption of recommended cowpea production

technologies. It was hypothesized that:

> "There is a relationship between the socio-economic characteristics of farmers and adoption of recommended cowpea production technologies".

The results of the statistical tests by correlation analysis for this hypothesis are presented in Table 6.

Table 6: Correlation Matrix Showing Relationship Between Variables

Variables	1	2	3	4	5	6	7	8	9	10
Age (1)	1									
Level of formal Education (2)	0.14	1								
Tenural status (3)	0.03	-0.11	1							
Subsidiary occupation (4)	0.29	0.15	0.26	1						
Farm size (5)	0.00	-0.4	-0.09	-0.29	1					
Farming Experience (6)	-0.15	-0.29	-0.18	-0.44	-0.15	1				
Labour availability (7)	-0.36	-0.5	-0.39	-0.65	-0.36	-0.21	1			
Extension contact (8)	-0.01	-0.15	-0.04	-0.03	-0.01	0.14	0.35	1		
Cooperative membership (9)	-0.29	-0.43	-0.32	-0.58	-0.29	-0.14	0.07	-0.028	1	
Credit availability (10)	-0.24	-0.38	-0.27	-0.53	-0.24	-0.09	0.12	-0.23	0.05	1
Adoption (11)	0.12*	-0.02	0.09	-0.17*	0.12*	0.27*	0.48*	0.13*	0.43*	0.36

*Variables significantly correlated with adoption at 0.05 level.

In table 6, the data revealed that there is a relationship between the socio-economic characteristics of farmers and adoption of recommended cowpea production technologies. Labour availability, membership of cooperative society or farmers' organization, availability of credit facilities, farming experience, practicing of additional or subsidiary occupation, extension contact, farm size, age, tenural status and level of formal education were found to be related to adoption of recommended cowpea production technologies.

Labour Availability

The result of the analysis on Table 6 reveals that this variable was found to be positively related to adoption of cowpea production technologies, $r = 0.48$. This relationship is significant at the 0.05 level. In fact, the relationship is a very strong one. It explains about 23% of the variability in adoption of the technologies.

The results obtained on this variable are in line with those obtained by other researchers. For example, Onyenwaku and Mbuba (1991), Erasmus and Omole (1983), Atala, et al (1992), among others, found that labour availability was positively and significantly associated to adoption.

Membership of Cooperative society or Farmers' Organization

The data on this variable revealed a positive and significant relationship with adoption of cowpea production technologies, r = 0.41. This relationship is significant at the 0.05 level. It explains about 11% of the variability in adoption of the technologies. The positive and significant relationship between this variable and adoption implies that those farmers who are members of some farmers' voluntary organization, such as the Young Farmers' Club (YFC), Farmers Cooperative Societies, etc are more likely to adopt the technologies.

The results obtained on this variable are in line with those obtained by other researchers, such as, Alao (1971), Mosher (1971), Laogun (1993) and Atala (1984) who found that participation in voluntary organizations was positively and significantly associated with farmers adoption of technologies. The implication of this finding is that adoption of improved farm practices could be enhanced if they are channeled through voluntary farmers' organizations.

Credit Availability

This variable was found to be positively and significantly related to adoption of cowpea production technologies, r = 0.36. This relationship is significant at the 0.05 level.

The data on this variable support findings by Mosher (1971), Osuji (1983) among others who reported that the ability of farmers to adopt new farm practices depend on their financial position and availability of incentives both to the extension personnel and the farmers.

Farming Experience

This variable was positively related to adoption of cowpea production technologies, r = 0.27. This relationship is significant at the 0.05 level. It accounts for about 4% of the variability in adoption of the technologies.

The findings of this study on farming experience are consistent with findings of Agbamu (1993), Igodan and Jabar (1993) among others who found that farmers' knowledge of a particular innovation made predominant contribution to adoption level.

Practicing of Additional or Subsidiary Occupation

This variable was found to be related to adoption. This relationship is, however, a negative one, r = -0.17. The relationship although in the opposite direction is significant at the 0.05 level. The data on this variable support findings by Basu (1969), Voh (1979) among others who found that ownership and full time occupation were important factors associated with adoption of farm practices.

20 JUN 2000
Ahmadu Bello University

Extension Contact

This variable was discovered to be positively related to adoption of cowpea production technologies, r = 0.13. The implication of this finding is that farmers who often have contact with Extension workers are more likely to adopt technologies. So, it can be said that adoption of improved farm practices could be enhanced if they are channeled through qualified extension personnel.

The findings of this study on extension contact are consistent with findings of Osuji (1983), Atala, Arokoyo and Omata (1992), Adefuye and Adedoyin (1993), Laogun (1993), Agbamu (1993) who found extension contact to be significantly related to adoption of recommended improved farm practices.

Farm size

Size of holdings was positively related to adoption of cowpea production technologies, r = 0.12. This result can be interpreted to mean that there is a chance that those farmers who possess bigger farms would be in a position to adopt the technologies.

The findings on this variable are in support of other findings in Nigeria and else where. For example, Basu (1969), Alao (1971), Atala, Arokoyo and Omata (1992), among others who found that size of farm had significant and positive

relationship with adoption of farm practices.

Age

This variable was found to be positively related to adoption of cowpea production technologies, r = 0.12. The implication of this finding is that, the older a farmer is, the more the number of technologies he is likely to adopt. This findings is in line with some previous findings. For example, Atala (1984), Lionberger (1960), Awogbade (1981), Williams' (1978), Voh (1970), among others who found that there is a relationship between age and adoption of farm practices.

Tenural Status

This variable was discovered to be positively related to adoption of cowpea production technologies, r = 0.09. This relationship eventhough positive is not significant at the 0.05 level.

The findings on this variable are in support of williams (1978) and Tiver (1978) who found that people who did not possess land were among the non-adopters of improved agricultural technologies.

Level of Formal Education

This variable was found to be negatively related to adoption of cowpea production technologies r = -0.02. This relationship is not significant at the 0.05 level. the implication of this relationship is that the higher the level of education of respondents, the fewer the number of technologies they adopt. This may be as a result of the fact that respondents who are highly educated are afforded the opportunity of being employed into white collar jobs which do not give them the chance to practice farming on a large scale.

The findings of this study on formal education are consistent with findings of Voh (1980), Mosher (1971), Lionberger (1960), among others who found formal education to be related to adoption of improved farm practices.

In summary, the findings supported the hypothesis that: "There is a relationship between the socio-economic characteristics of farmers and adoption of recommended cowpea production technologies".

Correlation analysis showed that labour availability, membership of farmers' organization, credit availability, farming experience, practicing of additional or subsidiary occupation, extension contact, farm size and age were found to

be significantly related to adoption of cowpea production technologies at the 0.05 level of significance. But, tenural status and level of formal education were not significant.

To test the contribution of each variable and allow for a more predictive analysis, stepwise regression analysis was used. In the stepwise analysis, tests were performed at each step to determine the contribution of each variable already in the equation. In other words, one variable is entered at a time and its contribution examined. This procedure was followed up to when no other variable make a significant contribution to the prediction equation. The results of the stepwise regression analysis are presented in Table 7.

Table 7: **Summary of the Stepwise Regression Analysis.**

Variables	Multiple^R	R^2	R^2 change	F-values
Labour availability	0.477	0.227	0.227	29.662
Cooperative membership	0.591	0.341	0.114	26.760
Experience	0.615	0.379	0.038	20.166
Age	0.649	0.422	0.043	17.062

The regression analysis showed that all these variables together explain about 42% of the variability in adoption of recommended technologies. Out of the four variables that entered the regression equation namely, labour availability, cooperative membership, experience and age, labour

availability made the greatest contribution of about 23% and it had a positive regression coefficient. This was followed by membership of cooperative society or farmers association which made about 11% contribution to the adoption level of the technologies. The inclusion of farmers' years of farming experience and age as significant variables further suggest that the adoption of recommended cowpea production technologies also increases as the farmers' experience about the technologies increases. These two variables accounted for about 4% each of the variability in adoption of the technologies.

The findings of this study therefore concur overwhelmingly with the theoretical logic developed and the findings of other studies in which socio-economic characteristics of farmers were studied in relation to the adoption of new farm practices. The findings of this study perhaps emphasize the fact that if farmers do not adopt agricultural innovations, it is not simply because, as Atala (1980) put it, they are fatalistic, lack risk orientation, uncreative, lack future orientation, lack entrepreneurship, suffer from very low achievement motivation, are superstitious and catholic, they have not learnt the development mystique of the protestant ethic and the spirit of capitalism, the values of saving and investing. One major reason is because of their socio-economic characteristics which do not facilitate the

adoption of the agricultural innovations.

Various researchers, namely, Atala (1980), Voh (1979), Arokoyo (1981), Auta, et al (1992), Atala, et al (1992) have shown that a cluster of personal and social characteristics of the potential users of new practices affect the rate of adoption of new practices. Lionberger (1960) upholds that social factors such as neighbours, community, family, social cliques; cultural factors such as values and attitudes, personal factors including age, education; psychological characteristics and situational factors including farm size, farm income, social status, community prestige are among forces that encourage or discourage adoption.

CHAPTER FIVE

5.0 SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of Findings

The detailed report of the findings of this study has been presented in the preceding chapter. Therefore, this section only highlights the major findings as they relate to the specific objectives.

The data analysed on personal characteristics of the respondents revealed that about half (52%) of the respondent farmers in the study area were relatively old with a mean age of 51 years. As expected, the majority (78%) of the respondents were literate. Only 22% of the respondents in this study had never attended school. Although, farming was the primary occupation of the respondents, more than two third (69%) of the respondents reported practicing some other occupations. These additional occupations include petty trading, tailoring, civil service work and so on. It was found that only a few (28%) belonged to cooperative or farmers organization. About half of the respondents (56%) indicated that they had never seen an extension officer before. The frequency of extension workers to farms was about once in a year on the average. Very few farmers (23%) indicated having obtained loan from either the bank or the government to carry out his/her farming operations. Farmers in the area cultivated about 2 ha of land on the average. They own their

land directly either through inheritance or purchase.

The knowledge level or awareness of recommended cowpea production technologies among the respondents was found to be fairly high while the actual adoption of the practices was comparatively low. The highest level of knowledge was in respect of use of insecticide (73%) and the lowest was the use of fungicide (23%). On the other hand, most of the recommended cowpea production technologies had only very low rate of adoption. Use of fungicide, fertilizer application, spacing, improved cowpea seeds, use of insecticide and use of recommended planting time were adopted by only 12%, 18%, 29%, 37%, 42% and 44%, respectively. The use of recommended planting time recorded the highest percentage of farmers' adoption because it fell within their normal practice in the area.

There were many and varied reasons given by the respondents for accepting or rejecting certain recommended practices. About one third (36%) of the respondents who adopted the practices affirmed that they did so to increase yield. On the other hand, those who did not adopt most of the practices (38%) complained of lack of awareness of the innovations. Others (31%) complained of not having interest in the technologies. Only 10% of the respondents said that inputs are not always available while 2% complained of lack of

credit facilitates and difficulty in the mastering of the innovation.

Correlation analysis revealed that there was a relationship between most of the socio-economic characteristics of farmers and adoption of recommended cowpea production technologies. Labour availability, membership of farmers organization, credit availability, farming experience, practicing of additional or subsidiary occupation, extension contact, farm size and age were found to be significantly related to adoption of cowpea production technologies. On the other hand, tenural status and level of formal education were not significant at the 0.05 level of significance.

The regression analysis revealed that all the variables put together explained about 42% of the variability in adoption of recommended technologies with labour availability, cooperative membership, experience and age making maximum contribution.

5.2 Conclusions

A number of conclusions could be drawn from the findings of this study.

1. The result of the study showed that Iwo Local Government peasant farmers were typically full time farmers, about 51

years old. Literate, with an average farm size of 2 ha, they owned the land directly through inheritance as well as purchase.

2. This study provided data which indicate that farmers in Iwo Local Government Area of Osun state had a moderate degree (50%) of awareness of the six recommended cowpea production technologies. However, their adoption level (30%) was found to be relatively low. The data showed that there was a substantial gap between awareness and adoption of the technologies.

3. There was a relationship between the various socio-economic characteristics studied and adoption of the recommended cowpea production technologies in the study area. Labour availability, membership of farmers organisation, credit availability, farming experience, practicing of additional or subsidiary occupation, extension contact, farm size and age were found to be significantly related to adoption of the technologies at the 0.05 level. However, tenural status and level of formal education were not significant. The regression analysis revealed that labour availability, membership of a cooperative society or farmers' organization, farming experience and age, made predominant contribution to adoption level of the technologies, and they all had a positive regression coefficient.

4. There were a number of problems facing the farmers in

adopting improved farming practices. The most frequently mentioned ones were lack of awareness, lack of interest in the practice, unavailability of inputs, lack of credit facilities and complexity of technologies.

5.3 Recommendations

In view of the above findings, the following recommendations have been made to improve the adoption level of recommended cowpea production technologies.

1. The study indicated that the majority of farmers in the study area can read and write. it is therefore, recommended that more instructional farming publications be produced to enable farmers get information on agricultural innovations.
2. Membership and participation in voluntary social organizations provides exposure to new information on farm practices. Such groups as the Young Farmers' Clubs, Farmers' Council and Farmers' Cooperatives serve as reference or consultants to the individual adopter in his/her decision making process. In view of the fact that only a few (28%) of the farmers in the study area belonged to these organizations, it is recommended that more farmers' organizations be formed as a vehicle for transmitting new farming innovations. Farmers must be made aware of the advantage of participation and be encouraged to participate in these organizations.

3. Personal contact is the most important instrument for arousing interest and for teaching and learning of new farming skills. The more frequently the farmer and the extension worker interact, the better the chances of adoption taking place. In view of the very low rate of contact between the extension workers and farm families in the study area, it is advised that more trained village level extension workers be employed.
4. Very few farmers (23%) indicated having obtained loan from either the bank or the government to carry out his farming operations. It is therefore suggested that the government's effort on agricultural production be intensified in giving loan to farmers both in cash and kind. Incentives, subsidies and credit facilities must be provided to the farmers to enable them purchase needed farm inputs necessary for adoption of new technologies in order to improve their farming.
5. Almost all the personal characteristics of the farmers were found to be significantly related to their adoption behaviour. Among these characteristics, labour availability, cooperative membership, experience and age were found to contribute most to farmers' adoption of improved cowpea technologies. Age is an important determinant of seniority among traditional societies. In Nigeria, the aged and the elderly persons hold a special position of leadership, prestige, respect and reference

among their communities. As such, age may play a significant role in the decision making process in the adoption of new farm practices in the study area. In this study, age was an important determinant of adoption of cowpea production technologies. It is therefore advised that in order to achieve greater positive results, extension worker should endeavour to always identify and work with those persons who are highly placed and respected in the society.

5.4 Suggestion for Further Studies

Eventhough, this study is considered to be a sample survey research, it is believed that its findings contain important and useful information not only for the planning and execution of agricultural projects in the study area but also for the institutions that are responsible for the development and dissemination of information on recommended agricultural practices as well as the various levels of government. It should, however, be noted that Iwo Local Government Area of Osun state may not be a typical local government since there are many local government areas that are not exposed to extension work like Iwo. It would therefore, be desirable to undertake similar studies in different types of local government in the state reflecting a state-wide situation before any definite conclusion can be reached.

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APPENDIX A:

DEPARTMENT OF AGRICULTURAL ECONOMICS AND RURAL SOCIOLOGY, FACULTY OF AGRICULTURE, AHMADU BELLO UNIVERSITY, ZARIA.

FACTORS INFLUENCING FARMERS ADOPTION OF COWPEA PRODUCTION TECHNOLOGIES IN IWO LOCAL GOVERNMENT AREA OF OSUN STATE.

FARMERS' INTERVIEW SCHEDULE

INTRODUCTORY STATEMENT

We are from the Department of Agricultural Economics and Rural Sociology, Faculty of Agriculture, Ahmadu Bello University, Zaria. We are interested in talking to you about your farming practices on cowpea production. This is a study organized in order to find better ways in which the government through the various ministries of Agriculture can help you in improving your farm practices for this crop thereby increasing production and combating protein deficiency in our society.

We shall therefore be very grateful if you can give us a few minutes of your time. Please, feel free and answer the questions that follow accurately and honestly. This research has nothing to do with tax assessment.

Thank you.

A: DEMOGRAPHIC CHARACTERISTICS.

1. Respondent's Name: _____

2. What is your age? _____

3. Did you ever attend any school? Yes [ ] No [ ]

4. If yes, what formal education do you have?

_____

5. Are you married? Yes [ ] No [ ]

6. If yes, how many wives do you have? _____

7. Do you have children? Yes [ ] No [ ]

8. If yes, how many children do you have?

_____

B: FARM AND FARMING CHARACTERISTICS.

9. What is your major occupation? _____

10. What is your subsidiary occupation?

_____

11. What food crops do you grow on your farm?

_____

12. What is the most important food crop you grow on your farm? _____

13. Do you feel that cowpea is valuable to your community? Yes [ ] No [ ]

14. How many plots do you have planted this year?

_____

15. How many did you use for cowpea production?

_____

16. What is the total acreage of all your plots?

_____

17. What is the total acreage you use for cowpea?

_____

18. Do you feel that cowpea production is suitable to your soil? Yes [ ] No [ ]

19. Do you feel that recommended varieties of cowpea in your area matures at a suitable time for harvesting?

Yes [ ] No [ ]

20. Do you feel that the recommended cowpea variety in your area give higher yields than your own local varieties?
Yes [ ] No [ ]

21. How many years have you been farming on your own?

_____

22. When do you normally plant your cowpea in your area?

_____

23. When do you normally plant your cowpea as recommended by the extension agent in your area _____

24. Do you feel that cowpea production requires extra labour?
Yes [ ] No [ ]

25. Are you getting the required labour necessary for working your cowpea farm Yes [ ] No [ ]

26. How many people do you have altogether working for you on your farm including wives, children and labourers?

_____

27. Do you own the land on which you presently farm?

Yes [ ] No [ ]

28. How do you acquire the land on which you are presently farming? _____

C. **ADOPTION RATE**

29. Please, indicate which of the following recommended cowpea production technologies you have heard of and when you first heard about it.

Practice	Aware of	Year
a. Improved Cowpea Variety	[ ]	[ ]
b. Recommended Spacing for cowpea	[ ]	[ ]
c. Recommended planting time for cowpea	[ ]	[ ]
d. Use of insecticides (e.g. cymbush, rogor)	[ ]	[ ]
e. Use of fungicide (e.g. Benlate)	[ ]	[ ]
f. Fertilizer application on cowpea (e.g. SSP)	[ ]	[ ]

30. Please, indicate which of the following recommended cowpea production technologies you are currently using and when you started using them. Also, please indicate which practice(s) are not applicable to your own farming situation.

Practice	Adopted	Year	Not Applicable
a. Improved Cowpea Variety	[ ]	[ ]	[ ]
b. Recommended Spacing for cowpea	[ ]	[ ]	[ ]
c. Recommended planting time for cowpea	[ ]	[ ]	[ ]
d. Use of insecticides (e.g. cymbush, rogor)	[ ]	[ ]	[ ]
e. Use of fungicide (e.g. Benlate)	[ ]	[ ]	[ ]
f. Fertilizer application on cowpea (e.g. SSP)	[ ]	[ ]	[ ]

31. If you do not adopt any of the above or any of them is not applicable to your farming situation, what are your reasons?

    a. Lack of awareness of the innovation

    b. Innovation knowledge difficult to master

    c. Not interested in the innovation(s)

    d. Innovation(s) do not fit into our farming systems.

    e. inputs are not always available

    f. lack of credit facilities

    g. No market for the farm produce

    h. Poor storage facilities for produce.

    i. Other farmers who use it failed

    j. Others (please, specify)_____

32. If you adopt and you are practicing any of the recommended cowpea production technologies above, what are your reasons?

    a. It gives high yield [ ]

    b. Resistance to pest and diseases [ ]

    c. Seen other farmers becoming successful with it [ ]

    d. Less labour required [ ]

    e. Low initial cost [ ]

    f. The extension contact rate forced it on us [ ]

    g. Other (please, specify)_____

D. <u>Sources of Information</u>

33. How did you first become aware of the recommended cowpea production technologies above?

    _____

34. Do you know the extension agent for your area?

    Yes [ ] No [ ]

35. If yes, how often do you see him?

E. Participation in Community Organization.

36. Do you belong to any cooperative or farmers organization?

Yes [ ] No [ ]

37. If yes, which organization do you belong

---

38. In the last two cropping seasons, how often do you feel you really had the opportunity to participate in group discussions with other farmers or members of your association?

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39. In the last two cropping seasons, how often do you feel you really had the opportunity to listen to extension agent give a talk or demonstration on new farming practices?_____

F. Credit.

40. Do you feel that credit facilities are readily available to farmers in your area?

Yes [ ] No [ ]

41. Is it given in cash or kind?_____

42. When do you normally get it?_____

Thank you.

APPENDIX B.

Table 8: **Distribution of Farmers According to Age.**

Age in Years	No. of Respondents	%	Cumulative
21-30	10	9.7	9.7
31-40	10	9.7	9.7
41-50	13	12.6	32.0
51-60	54	52.4	84.5
61 and above	16	15.5	100.0
Total	103	100.0	

Mean age in years = 51.

Table 9: **Distribution of Farmers According to Level of formal Education.**

Education	No. of Respondents	%	Cumulative
Never attended school	23	22.3	22.3
Primary education	15	14.6	36.9
Secondary/TTC	20	19.4	56.3
Higher secondary	23	22.3	22.3
University	22	21.4	100.0
Total	103	100.0	

Table 10: **Distribution of farmers According to Marital Status.**

No. of Wives	No. of Respondents	%	Cumulative %
0	20	19.4	19.4
1	62	60.2	79.6
2	14	13.6	93.2
3	3	2.9	96.1
4	4	3.9	100.0
Total	103	100	

Table 11: **Distribution of farmers According to Number of Children.**

No. of Children	No. of Respondents	%	Cumulative %
None	22	21.4	21.4
1-3	37	35.9	57.3
4-6	23	22.3	79.6
7-9	10	9.7	89.3
10-12	4	3.9	93.20
13-15	2	1.9	95.1
16 and above	5	4.9	100.0
Total	103	100	

Table 12: Distribution of Farmers According to Occupation.

Occupation	No. of Respondents	%	Cumulative %
Farming/government work	45	43.7	43.7
Farming/Trading	13	12.6	56.3
Farming/Apprenticeship	13	12.6	68.9
Farming Only	32	31.1	100.0
Total	103	100	

Table 13: **Distribution of Farmers According to Farm Size.**

Farm size (ha)	No. of Respondents	%	Cumulative %
Below 1 ha	37	35.9	35.9
1 - 2ha	38	36.9	72.8
Above 2 ha	28	27.2	100.0
Total	103	100	

Mean size of farm per farmer = 2 ha.

Table 14: **Distribution of Farmers According to Years of Farming Experience.**

Experience (Years)	No. of Respondents	%	Cumulative %
1 - 3	18	17.5	17.5
4 - 6	26	25.2	42.7
7 - 9	5	4.9	47.6
10 - 12	9	8.7	56.3
13 - 15	12	11.7	68.0
16 and above	33	32.0	100.0
Total	103	100	

Table 15: **Distribution of Farmers According to Labour Availability**

Labour Availability	No. of Respondents	%	Cumulative %
No opinion	44	42.7	42.7
No	7	6.8	49.5
Yes	52	50.5	100.0
Total	103	100	

Table 16: Distribution of Farmers According to Land Status.

Tenancy Status	No. of Respondents	%	Cumulative %
On lease	30	29.1	29.1
Rented	17	16.5	45.6
Inherited	43	41.7	87.4
Purchasing	11	10.7	98.1
Government will	2	1.9	100.0
Total	103	100	

Table 17: Distribution of Farmers According to Extension Contact

Extension Visit	No. of Respondents	%	Cumulative %
Never	58	56.3	56.3
Seldom	4	3.9	60.2
Occasionally	15	14.6	74.8
Often	26	25.2	100.0
Total	103	100	

Table 18: **Distribution of Farmers According to Farm Membership of Cooperative or Farmers Organization.**

Cooperative Membership	No. of Respondents	%	Cumulative %
None	75	72.8	72.8
Thrift & credit cooperative society	3	2.99	75.7
Religious/Social organization	5	4.9	80.6
Young farmers' club	12	11.7	92.2
Farmers Cooperative Society	8	7.8	100.0
Total	103	100	

Table 19: **Distribution of Farmers According to Availability of Credit Facility**

Credit Availability	No. of Respondents	%	Cumulative %
No opinion	7	6.8	6.8
No	72	69.9	76.7
Yes	24	23.3	100.0
Total	103	100	