THE EFFECTS OF EXTENSION SERVICES ON SHALLOT FARMING IN THE ANLOGA AREA WITH RESPECT TO THE ADOPTION OF INNOVATIONS

BY

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DECLARATION

I, DANIEL STANLEY KOFI ZIKPUI, do hereby declare that except for references to other people's work which have been duly cited this work is the product of my own original research. I also solemnly declare that this dissertation has neither in whole nor in part been presented for another degree elsewhere.

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DEDICATION

This work is dedicated to the memory of my late mother Madam Abla Gidima Yaku, who sowed the seed, and to my sister Mrs. Inatana Ami Togo and my wife Mrs Beatrice Abla Zikpui nee Agbezinu, who nurtured the plant to maturity.

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ABSTRACT

The study examined the innovations introduced into the shallot farming in the Anloga area, and how they were introduced to the shallot farmers. The main aim of this study being to find out the effects of the extension services on shallot farming in the Anloga area of the Volta Region.

In all, 192 shallot farmers aged between 18-57 years; and six extension agents of the Ministry of Food and Agriculture (MoFA) were studied. Separate structured questionnaires with both open ended and closed ended questions were used to collect data from the shallot farmers made up of both extension follower farmers who belong to extension groups and other farmers who do not belong to any of the extension groups and six agricultural extension agents in the study area.

The data collected were analysed to address the main concerns of the study, viz;

i) what the shallot farmers and the extension agents consider as innovations in the shallot farming.

ii) the extension methods used in introducing the innovations to the farmers, and the sources from which information about the innovations were delivered to the farmers.

iii) the changes or outcomes brought brought about to the farmers as a result of the use of the innovations.

Using percentage frequency distributions and cross tabulations, the study revealed that both the respondent shallot farmers and the extension agents in the

Anloga area have a common understanding or meaning of what innovations are. The results further showed that though the shallot farmers were introduced to the innovations from different sources such as extension agents, sellers of farm inputs, including Farmers' Services Company (FASCOM), Non-governmental organizations (NGOs), publications, and farmer friends, majority of them were introduced to the innovations and received information about the innovations from their farmer friends. Also the respondent shallot farmers readily and continuously received information about the innovation more from their farmer friends than from the other sources.

The study also showed that verbal explanations by farmer friends and watching the examples (demonstrations) of farmer friends were the main methods by which the respondent farmers learnt how to use the innovations. In addition, the results revealed that majority of the respondent shallot farmers preferred the verbal explanation of their farmer friends than the verbal explanations and demonstrations of the extension agents.

Though the results revealed that the majority of the respondent shallot farmers agreed that the innovations introduced have brought changes such as increase yields, increase in number of farm beds cultivated and effective pest control, into shallot farming in the Anloga area, majority of the respondent farmers would not attribute such changes to extension activities.

The main recommendations are that the extension agents and in fact all those interested in introducing innovations to the shallot farmers in Anloga should strive to form functional groups of farmers with whom they should work. Secondly, local farm research should be encouraged and conducted on the cultivation of the non traditional food crops and vegetables to generate production (extension) recommendations that could be acceptable to the farmers. Thirdly the use of the contact farmers (other farmers) should be widened and intensified in order to facilitate the dissemination of ideas and information among wider spectrum of farmers.

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ABBREVIATIONS

1.	ASRP	:	Agricultural Sector Rehabilitation Project
2.	DAES	:	Department of Agricultural Extension Services
3.	D.D.T.	:	Dichloro-Diphenyl Trichloroacetic Acid
4.	FASCOM:	:	Farmers' Services Company
5.	GCC.	:	Ghana Cotton Company
6.	IDA	:	Irrigation Development Authority
7.	IFAD	:	International Fund for Agricultural Development
8.	ISSER	:	Institute of Social, Statistical and Economic Research
9.	MOA	:	Ministry of Agriculture
10.	MoFA	:	Ministry of Food and Agriculture
11.	MTADP.	:	Medium Term Agricultural Development Plan
12.	NAEP	:	National Agricultural Extension Project

13.	NGO	:	Non-Governmental Organisation
14.	TO	:	Technical Officer
15.	T&V	:	Training and Visit
16.	URADEP	:	Upper Region Agricultural Development Project
17.	VORADEP	:	Volta Region Agricultural Development Project
18.	WVI	:	World Vision International

CHAPTER ONE

1.0 INTRODUCTION

In Ghana and elsewhere in the world, the development of agriculture is considered as one of the surest prerequisites to solving the problem of rural poverty. The bringing about of such development rests ultimately upon the designing and execution of action aimed at encouraging and helping the farmers to adopt and use new technologies and innovations that are essential in bringing about the desired changes in their farming practice.

It is essential therefore that agencies and institutions that are connected with farmer education programmes - extension services - in the country continually evaluate their activities to determine whether the opportunities and the new experiences provided to the farmers are effectively used by the farmers. This stems from the fact that for agricultural production to be increased there must be changes in the ways that the production is carried out and for this, the producers (farmers) need new ideas in the form of innovations. This study therefore seeks to examine what extension has done to help the shallot farmers of Anlo area in the Keta District over the last fifteen years to improve their production and to determine other effects.

1.1 MEANING AND SCOPE OF AGRICULTURAL EXTENSION

Agriculture extension involves helping farmers identify and analyse their production problems to become aware of the opportunity for improvement. It is regarded as an educational process in which practices and technologies that have been proved sound by research, experimental trials and local experiments are diffused to farmers through various communication strategies. The aim is to bring about desirable changes in knowledge, skills and attitudes of the farmers concerned about their

farming. Such changes when applied to the economic activities can lead to increased agricultural production and in turn greater wealth, greater well being and satisfaction. In this process, help to the farmer is not dissociated from help to his family, and from this small social units the benefits accumulate and contribute to community and national prosperity. There has therefore been a growing interest in the role of agricultural extension in the development of agriculture in many countries, both the developed and developing. As such many countries all over the world have made substantial investments in agricultural extension.

Farmers naturally seek and acquire useful agricultural knowledge to develop their farms and upgrade their management skills. This they do in a number of ways. They may either contact other farmers or join farmer's associations which are formed for such purposes or deal with agencies or institutions that sell farm inputs etc. All these can be viewed as forms of extension, because useful information, ideas, practices etc. for improving their agricultural production are disseminated or made available to them through such means. However agricultural extension as a publicly provided service is carried on by Ministries or Departments of Agriculture and other agencies and organizations that are involved in providing technical advice to the farmers.

The objectives of agricultural extension as suggested by Penders (1956) are to raise agricultural productivity, standard of living of the rural population and rural welfare. This involves the improvement of the technical and managerial side of farming. Thus agricultural extension revolves around the introduction of innovations to farmers, based on their needs. The methods used in agricultural extension are based on the principle of helping people to help themselves. To help people help themselves as observed by Leagans (1961), is one of the principles at the very core of all extension programmes. And according to Leagans (1961), helping people to learn to help themselves requires education which in turn requires learning and learning requires teaching. Extension is thus

concerned with the development of the knowledge, will power and skill of the people to solve their problems by their own efforts (Saville, 1965). Extension therefore stresses the need for the development of the " whole man for total involvement and for total participation" (Butt, 1961:43). It is in this connection that the educational role of extension is emphasized. However, it is a voluntary, out-of school type of education, which uses teaching and learning principles in imparting knowledge to farmers. As observed by Williams (1977), extension education thrives well in an atmosphere of mutual trust and respect between the extension agents and their clientelle. It is the fundamental process through which the farmers learn the reasons for change, the merits of change, the results that can be achieved; how they can be achieved and the uncertainties inherent in the change. In the development of agriculture, Williams (1977), notes that extension has three major functions. These are:

1. To encourage farmers to accept technological change
2. To disseminate relevant research findings among farmers and to carry farmers problems back to research organizations and
3. To help farmers acquire managerial skills in decision making.

To perform the above functions effectively, Williams (1977) observes that an extension team comprising, an administrator, a researcher, a communicator and the farmers, is very crucial.

Many countries the world over have realized or known the worth of agricultural extension in the bid to modernize agriculture with the ultimate aim of improving the living standards of their people. Ghana is no exception. Though the last two decades have seen a number of remarkable developments in the social, economic, political and educational fronts, all is not well in the agricultural front in most developing countries. Food prices continue to soar every year because of the inability of supply to meet the ever increasing demand. This unfortunate situation is further aggravated by the rural-urban drift by

which the ablebodied men and women who could engage in farming tend to shy away from the industry and rather prefer buying and selling in the urban areas (Williams and Williams, 1972). For this unfortunate trend to be reversed and for agricultural production to be stimulated to cope with the ever increasing demand for its products, a firmer and stronger base for the industry must be established in the rural areas where the bulk of agricultural production takes place. This, no doubt, calls for a critical appraisal of the extension activities in these areas. This stems from the fact as noted earlier that agricultural extension has definite functions to play in the development of agriculture. And it is only when these functions are effectively performed by extension that the corresponding increased production can be attained with its concomitant improved standards of living for the people.

1.2 DEVELOPMENT AND ORGANIZATION OF EXTENSION IN GHANA

Agricultural extension work as a publicly provided service is believed to have started in the then Gold Coast around 1890 with the establishment of the Botanic Gardens in Aburi in 1890. The aims of the establishment of this garden at that time were to teach the local people to cultivate economic plants systematically to boost their export potential, to raise and distribute valuable plants in large quantities. From this humble beginning, extension work expanded with the establishment of Agricultural stations at Tarkwa, Kumasi, Asuansi and Tamale with other smaller agricultural substations all over the country. As extension activities expanded in these early years, Mason (1968) reports that "Travelling Instructors" visited farmers and gave advice on the care and management of crops grown. They also started what were termed "Model Farms". The latter consisted of several plots of different types of cocoa and a plot of para rubber. They served as demonstration farms to the owners. During this time, the line of approach used in trying to improve local agriculture was based on

farm surveys and observations followed by experiments, demonstration, and extension in that order. From this developed the method of basing extension work in the country on the results of experiments at agricultural stations. With this line of extension the early extension workers began to demonstrate practices recognized by the Department of Agriculture to be desirable and profitable to the farmers (Mason, 1968).

During the period of the trusteeship of the 1920's more agricultural stations were opened and the emphasis was shifted to local conditions and investigation work on new crops. Recommendations to farmers were based on experiments at these stations. The period just before the outbreak of the 2nd world war saw the development of the cooperative movement and producers societies. Although these were primarily concerned with marketing of cocoa, coffee and other cash crops, they also provided the fora at which the staff of the Department of Agriculture discussed production of crops other than cocoa and examined members' agricultural problems (Mason 1968). Since then, extension work in the country has undergone a number of transformations. After independence in 1957, the United Ghana Farmers. Cooperative was formed and it partially took over extension activity. However, after the 1966 Coup, all extension work in the country was brought under the Ministry of Agriculture. This change did not improve the performance of the extension services at the time. For as noted in the Medium Term Agriculture Development Plan (MTADP) (1990) "there was no coherent extension system, properly assembled technological packages, qualified extension staff and material support". (MTADP, 1990:15-16). It was to ameliorate the situation that the "Focus and Concentrate" extension project was initiated in 1968. This programme of extension was designed to concentrate advisory services and distribution of inputs in certain geographical areas identified as having a comparative advantage for the production of a particular crop.

The decade between 1970 and 1980 opened a new chapter in extension work in the country with the initiation of World Bank Supported projects viz;

1. Upper Region Agricultural Development Project (URADEP)
2. Volta Region Agricultural Development Project (VORADEP) and
3. Agricultural Sector Rehabilitation Project (ASRP).

This era also saw the introduction of the Sasakawa Global 2000 and the Canadian Supported Grains and Legumes Development projects. Other extension initiatives in the country include those sponsored by Commodity organizations like the Ghana Cotton Company (GCC), Bast Fibre Development Board and the Tobacco Companies. In addition to these, are the Ghana Irrigation Development Authority (IDA) projects and International Fund for Agricultural Development (IFAD) supported projects in the rural areas.

An interesting observation during this period about all these projects and programmes is that their activities were not streamlined and as noted in the (MTADP 1990) "there was no standard extension system and each project implements its programmes independent of the policies and programmes of the extension services of the various departments of the Ministry of Agriculture" (MOA).

In 1987, the Department of Agricultural Extension services (DAES) was reorganized by the MOA with the responsibility of consolidating all non-cocoa public agricultural Extension service to bring them under one umbrella. This marked the birth of a Unified Extension System in Ghana. By this all extension messages or programmes are to be channelled to the farmer through a single agent under the administration of Department of Agricultural Extension Services (DAES). Under this new arrangement, there would be no parallel extension service for women farmers. The extension service is

now rightly tasked with the responsibility of the transfer of technologies to farmers and to advise agricultural research and other agricultural support services about farmers' needs and constraints. The service is not responsible for tasks such as credit intermediation and input and produce marketing (National Agricultural Extension Project, NAEP 1992). With this strategy, administrative mechanisms were put in place to effectively link extension and research activities in order to develop relevant and appropriate technologies that could be adopted by farmers to solve agricultural problems facing them. Farmers are encouraged and assisted in the new set up to participate in setting the research agenda; planning extension activities; in forming groups to facilitate the availability of credit and input supply as well as marketing of output.

The DAES is headed by a Director assisted by three deputies each with responsibilities for Agricultural Extension Services Division, Women Farmers Extension Division and the Training Division (National Agricultural Extension Project, 1992). In the new set-up, programmes are planned at headquarters in consultation with the Regional Extension officers and executed at the field level by district, area and zonal extension officers. (NAEP, 1992:13). The DAES as presently constituted operates in all the 110 districts of the country. However extension field work in the districts is basically carried on by frontline staff who by the MOA's classification belong to the sub technical category (NAEP, 1992). They are the agents who are in direct contact with the farmers and they are expected to be the vital links between the farmers on one hand and the MOA and research institutions on the other. This new trend in the organization of extension work in the country, perhaps stems from the observation in the report on the Agricultural Extension Strategy under the Medium Term Agricultural Development Plan (MTADP, 1990) that the extension agents were involved in too many activities in the field. And according to the report the multiplicity of such activities as "management of

procurement and distribution of inputs, collection of input payment and organizing farmers into groups for mechanization and credit services and collection of rainfall data" (MTADP, 1990:39) cast doubts about the efficiency of Extension delivery in the field.

1.3 ORGANIZATION OF EXTENSION SERVICES

Different approaches may be adopted to the organization of extension activities by governments. Baxter, Slade, and Howell, (1989) have identified four such approaches and categorised them as:

1. Rural Extension
2. Commodity Extension
3. University based Research Extension
4. Ministry (Department) of Agriculture Extension.

In the rural extension approach, dissemination of information about agriculture is regarded only as one part of a wider government effort in changing rural attitudes and promoting community self reliance. The emphasis here is on human resource development in addition to technology development within agriculture. This is based on the assumption that agriculture is the main vocation of most rural people. As such when agriculture develops, it will bring about improvement in the standards of living of the rural people. Characteristically therefore, rural extension is targeted on poorer rural groups or communities to improve their incomes, welfare or possibly access to services and assets such as land and water.

In commodity extension approach, effort is concentrated on specific commodity; providing a relatively intensive service to improve the productivity of a specific crop or commodity eg. cocoa,

coffee etc. In this situation much attention is focused on quality control, supplies of inputs, disease and pests control and marketing.

The University-based research approach is modeled on the United States Land Grant model. Extension is seen as carrying research result to farmers and linking farmers requirements to the research system. Under this system scientists become extension workers while additional agents are used to serve the research station scientists with information from the field.

The Ministry (Department) of Agriculture extension involves the establishment of an Extension service. The main function of this service is to link farmers and research scientists in a two-way communication process in which ideas about farming are exchanged. This approach encompasses the elements of the other three approaches mentioned earlier. In this approach, technical advice involving new ideas and practices about farming, that have been developed by research institutions, experimental stations, field trials etc, are transmitted to the farmers by field agents - the extension agents.

In Ghana, extension provided by the public system, is basically organized on this line of approach. The Ministry of Agriculture is in control of extension in which the general educational and advisory roles of extension in facilitating the promotion and adoption of new technologies by farmers are stressed. In order to facilitate and enhance extension work, the Ministry of Agriculture has field staff who work as extension agents among the farmers. These agents carry on the task of helping these farmers to improve their agricultural production. This they do by introducing and encouraging the acceptance of improved practices to the farmers. Nevertheless, there are other groups and Non-governmental organizations and institutions that also engage in agricultural extension work in the country using their own line of approaches.

The organization of extension activities in the Anloga area of the Keta district is handled by the District Agricultural Extension Officer, who in turn works with a number of frontline staff. In the Anloga area the main agricultural activity centres around the cultivation of shallots. The system of extension used in the district is the Training and Visit (T & V) system. The frontline staff works in a well defined sub district (See Appendix 1). In each sub-district the extension agents form groups of farmers of between 10-15 members. Each group has a leader who is referred to as the contact farmer. The latter is always in close contact with the frontline staff and relays any message from extension to the other group members or follower farmers. The frontline staff visit their groups fortnightly. They may also meet with any other farmer who wants special attention or has a special problem. It is on these visits that the frontline staff teaches the farmers whatever technology package or improved practice or innovation he or she is promoting.

1.4 THE RESEARCH PROBLEM

As pointed out earlier the major agricultural activity in the Anloga area is shallot farming. Like any farming enterprise, the shallot farmers are concerned about how to increase their productivity. In the same vein, the extension staff is expected to help the shallot farmers to improve their productivity through the introduction of innovations and/or advising them as to how to improve their farming.

One of the main responsibilities of the extension services involves making available appropriate and improved technologies to the farmers to help them improve their operations. The need for an appropriate technology supported with a sound extension advice cannot be overemphasized in any effort to transform practices associated with peasant agriculture. Anthony, Johnson, Jones, and Uchendu (1979) observed that two factors are very crucial to any successful extension activity.

These factors according to them are:

1. Availability of worthwhile innovations (technology) suited to the needs of farmers and
2. The type of strategy that is employed for promoting the diffusion or transfer of information about the innovation to the farmers.

Although the above factors are crucial and are given prominence in all extension work, concerns are often expressed that a large number of innovations and technologies are being released and being communicated to the rural people, but the effects of such endeavors have not been quite pronounced as might be expected (Singh, 1981).

Activities designed to help farmers improve their production are based on innovations or improved technologies. These innovations or improved technologies are then promoted with the understanding that when accepted and adopted, would bring the needed improvement in the standard of living of the people. In Ghana, the extension service is actively involved in reaching farmers with innovations using various communication strategies. However, the lots of the farmers have not seen the desired improvement. More often than not, in trying to find the causes of the low performance or stagnation in the agricultural sector, the tendency is to narrowly examine the extension services only in terms of how extension activities are carried out among the farmers, without much attention to the content (new practices or ideas - innovations that the service disseminate). According to Gentil (1989), an extension system should not be analysed in and of itself but must be examined in the context of the innovations being transmitted. This has been the concern of many who have extension work at heart. For example, Bortei-Doku (1985) also raised this concern when he observed that what should be extended was a question that faced most extension officers in the field.

In the bid to help farmers improve their production through the use of such innovations, it is suggested that innovations should not only be appropriate but must also be suited to the farmers' situation if farmers are to be helped to increase production. Despite the efforts of extension, results are not being realised. Why is this so? Whatever the answers may be, it is important to note that for farmers to adopt and use the innovations they do not only need information about the benefits of such innovations but also how to use the innovation. The information about a particular innovation may reach the farmers from various sources. Wilkening, Tully, and Presser, (1962) observed that farmers generally may obtain some information about innovations through neighbours, friends, and relatives. However, other sources of information about innovations may be government extension agents, commercial firms engaged in the sale of agricultural inputs and some Non-Governmental Organizations (NGOs). The field agents of these agencies and organizations use various extension techniques in reaching out to the farmers with their messages. These techniques are selected to suit the specific innovation and the production environment. These techniques may include visits to the farmers, training sessions for farmers, use of mass media, demonstrations etc. Since these are the means by which the agent puts across his message concerning the innovations he is promoting, any attempt to assess the work of the extension agent must also be concerned with these communication or information delivery techniques. Again the general observation in this aspect of extension work is that there are communication gaps between the farmers and the agent. That is, what is expected of the extension agent and what he does in practice with information delivery among the farmers, leaves much to be desired. There is therefore the need to critically examine what is being done and their outcomes in order to provide appropriate remedies.

1.5. THE RESEARCH QUESTIONS

As pointed out earlier, extension activities designed to help farmers, rely on various innovations or technology packages and advice and information dissemination strategies to achieve the set objectives. However, food production still lags behind the demand for it. In most cases, this failure or non achievement of goals is more often than not blamed on the farmers who are variously labelled in this connection as being lazy, conservative, not willing to put innovations into practice or to change their old ways of doing things. However researchers are still grapling with the problem of low productivity in agriculture by creating innovations. The question that needs to be looked at is which innovations are extension promoting and how do they ensure that these innovations get to the farmers who need them to help them increase production?

Specifically, therefore, the questions that this study seeks to answer are:

1. What innovations (if any) have been introduced to the shallot farmers and what are the sources of such innovations?
2. What extension methods are used in promoting the innovations to the farmers?
3. What are the results or outcomes of the introduction of the innovations to the shallot farmers?

1.6. OBJECTIVES OF THE STUDY

The main objective of this study is to determine the effects of extension services on the shallot farming in the last fifteen years in the Anloga area. More specifically the study has the following as its objectives.

1. To find out from the farmers what they consider as innovations in their farming
2. To identify the types of innovations or improved practices that have been introduced into the shallot farming over the last fifteen years.
3. To identify the kinds of advice shallot farmers received from the extension agents.
4. To identify the sources of the innovations that have been introduced to the farmers.
5. To identify the sources from which the farmers received information about the innovations.
6. To identify the methods used in the introduction of the innovations.
7. To determine the appropriateness of the innovations and advice introduced to the farmers and
8. To find out the results or changes that the innovations and advice have brought to the shallot industry in Anlo area.

1.7 SIGNIFICANCE OF THE STUDY

Not much has been done by way of research on the cultivation of shallot in the Anlo area, though Benneh, (1971) and Nukunya (1972) made references to the crop in their works on land use in the Anlo area. Other earlier workers like Purnell (1955) and Quansah, (1956) however commented on

the ingenuity and skill of the shallot farmer in the Anloga area in relation to the turning of a physically unsuitable environment into a highly productive one and developing one of the most intensive and viable local or traditional vegetable farming system in Ghana. However there is a dearth of literature on how the shallot farmers have managed to come that far in the development of the shallot industry with regards to the inputs and skills that they use. However, not much work has been done on the shallot industry in Anlo area with regards to extension activities in the area. Hence the need for a study to find out the types of innovations they are using and the sources from which these have been made available to them and what extension has done to help them improve their production.

CHAPTER TWO

2.0 LITERATURE REVIEW

An observation by Anthony, Johnson, Jones and Uchendu, (1979) points to the fact that farmers who recognise that their traditional farming techniques and present level of knowledge impose a limitation on their farming activities and thus realise the need for new ideas (innovations) are on the threshold to success. If this observation is viewed from the background that the demand for basic food is outstripping its production in many developing countries including Ghana, then the use of innovations to increase productivity in the agricultural sector cannot be overemphasized. Improved agricultural production would not only help alleviate food shortages but would also lead to increased incomes and enhanced statuses for farmers. This progress in agriculture if it is to be achieved, depends to a large extent on the adoption and use of such technology and innovations that have been proved sound for the purpose (Van den Ban, 1957).

Extensive researches have been done on farm innovations and technology relating to what they are, how they reach farmers, factors that influence their adoption and use by farmers, and the consequences of their adoption.

The literature surveyed thus covers the following topics relating to the major themes of this study:

1. Innovations
2. Farmers as an adoption unit
3. Transfer of Information
4. Outcomes of adoption of Innovations.

2.1 INNOVATIONS

Farm technology involves the methods by which the farmer sows, cultivates, harvests his crops, the tools and implements he uses and his daily routine for farming operations. When these are new and novel in relation to the knowledge and experience of the user as Presser (1969) defines it, it becomes an innovation. Earlier Rogers (1962) defines an innovation in general as "an idea, object or practice perceived as new by the individual". From his adoption studies, Rogers (1962) observed that the newness of an idea, practice or object, determined the individual's reaction to it. Agricultural innovations may thus be thought of as including new husbandry practices, the use of improved seeds, mineral or artificial fertilizes, soil and water conservation methods. Improved practices are also regarded as innovations as long as they are modified in form and have new functions compared with their forerunners. And as Jones (1963) puts it, an innovation could be regarded as any thought, behaviour or thing that is new because it is qualitatively different from existing forms.

Adams (1982) on his part, associating his definition to the farm situation, states that farm innovations include ideas, methods, practices or techniques which provide means of sustained increase in farm productivity and income. It is the latter function of innovations as means of "Sustained increase in farm productivity" that has given innovations their unique position in all extension work.

It is thus a generally held view that innovations and for that matter technological change results in economy and efficiency. Thus farm innovations when introduced and adopted should bring about qualitative and desirable changes in the system into which they have been introduced. And despite the fact that farm innovations are always intended for the well-being of farmers, research has shown that farmers generally do not find or perceive all innovations as suitable or appropriate to their situation. As such some people may adopt new ideas and practices while others may not. On the other hand some

may adopt the same innovation more quickly than others. This presupposes that innovations do not have the same ranking in the adoption rating scale of individuals. This view was confirmed by Feaster (1968) when he observed that although innovations are fundamental to agricultural and economic development in most developing countries, they are not always readily accepted by the farmers. This raises concerns and questions as to what constitutes an appropriate or suitable innovation or technology to recommend for dissemination to the farmers and which lends itself to be readily adopted and used by the farmers. On the other hand, this presupposes that innovations in themselves have certain attributes and characteristics that influence their acceptance and adoption. Social scientists too have identified a number of factors that influence the acceptance and adoption of innovations among which is the characteristics of the innovation to be adopted.

2.1.1 CHARACTERISTICS OF INNOVATIONS

For innovations to be accepted, it is obvious that they must be first made available to the potential users or adopters. Apart from its availability, an innovation must have a number of characteristics as perceived by the individual that will enhance its acceptance and subsequent adoption. Knowledge of the characteristics of innovations that influence the decision to adopt or reject them, is very useful in the planning of campaigns and programmes for the introduction of the innovations. If these characteristics are carefully considered, it is possible to plan strategies in such a way that the innovations become more acceptable. Rogers (1962) categorizes these characteristics as:

1. Communicability
2. Complexity
3. Compatibility

4. Divisibility

5. Relative advantage

This typology of innovation characteristics as they influence the adoption process was adopted by MacDonald (1976) and Adams (1982).

2.1.1.1 **Communicability:**

This is what Adams (1982) refers as to observability. It is the degree to which it is possible to visualize or communicate the expected results of an innovation. The potential user needs innovation evaluation information to aid him in his adoption process. Rogers (1962) observed that the results of some new ideas, or practices are easily observed and communicated to others while others are difficult to describe to others. The likelihood that an individual adopts an innovation is thus influenced by how readily the results or advantages can be diffused to him. For instance the use of pesticide to control eel worm in the soil may not be easily communicable because eel worms killed by the chemical may not be easily seen. Thus the rate of adoption of this practice may be slow. Ideas and practices which are more communicable or whose benefits can be readily observed tend to diffuse more readily from the user farmers to others.

2.1.1.2 **Complexity**:

This is the degree of difficulty in explaining and utilizing an innovation. This attribute also concerns the ease with which a practice can be explained and demonstrated to others and to be understood by them. MacDonald (1976) stated that knowledge about the innovation may exist in the

society but this has to be made available to individuals who have to use them in forms that are clearly and easily understood by them. This observation is in agreement with the view of Rogers (1962) that any new idea or innovation may be classified on the complexity - simplicity continuum with the generalization that the simpler the idea the higher the adoption. This implies that innovations that are clear and simple in their meaning and use to members of a social system to which they are introduced, are easily adopted.

2.1.1.3 **Compatibility:**

This is the degree to which the farmer perceives an innovation to be consistent or congruent with his present values, his management objectives, level of technology, needs etc. According to Rogers (1962) compatibility ensures a sense of security to the potential adopter and makes the new idea more meaningful to him. Compatibility brings to the fore any relationship that may exist between the innovation and its forerunners, values and former experiences of the potential user. For instance the absence of compatibility of pig production in Moslem Communities with the religious values of Muslims will definitely stand in the way of adoption of this innovation in such communities. The attribute of compatibility of innovations provides the basis for comparing new ideas or innovations with old ones. The greater the compatibility or congruency, the greater will be the adoption.

2.1.1.4 **Divisibility (Triability)**

This is the degree to which an innovation can allow trial on reduced scale without committing too much money or resources initially. Some new ideas or practices for that matter, innovations, may

not allow small scale trial before their adoption because they cannot be divided into smaller components. Such innovations may not be readily adopted by the farmer who wants to try it on a limited scale before committing more resources to it. This attribute of triability relates to the cost factor involved in the adoption of innovation as stated by Lionberger (1960). The latter observed that changes that cost little and do not need much resources for their adoption initially, are more quickly adopted than those requiring large expenditures.

2.1.1.5 **Relative advantage**:

According to Adams (1982) relative advantage is the degree to which an innovation is recognized as better than the idea or object it is intended to replace. This may be viewed against the background of economic gains or low risk factors, satisfaction and convenience that may be offered by the new idea. This is in agreement with the observation of Doyle (1974) that a fairly high return on an innovation is required before the farmer appreciates that the new technique is of real benefit. A new technology or idea being promoted must bring with it for instance additional earnings to stimulate interest for its adoption.

Knowledge of these characteristics of innovations is very vital for the change agent for preparing his programmes or plans for the promotion of innovations among his clientele. Armed with and guided by this knowledge, it is possible for him to develop a better understanding why certain innovations are accepted and why others are rejected.

2.2 THE FARMER AS AN ADOPTION UNIT

Farm innovations are meant to be adopted and used by the farmer to improve his lot. However, it has been observed that though an innovation may be introduced at the same time at the same place and to the same group of farmers, some adopt the new ideas and practice more quickly than others (Bose, 1961). This seems to suggest that farmers are not equal on the adoption rating scale and thus raises the fundamental issue of what influences or determines the farmer's individual reactions to the innovations being introduced to him.

The reason why some people adopt new ideas and practices more quickly than others according to Lionberger (1960) is related in part to the individual himself. According to him a number of individual farmer characteristics influence the adoption behaviour of farmers. These factors as pointed out by Lionberger (1960), include:

1. Age
2. Level of education
3. Income level or degree of wealth
4. Farm size
5. Tenure status
6. Sources of farm information
7. Fatalism

2.2.1 **Age**:

The influence of age as a factor in the adoption behaviour of the individual farmers is quite debatable. Where as Lionberger (1960) suggests that elderly farmers generally seem to be somewhat less inclined to adopt new farm practices than younger farmers, Rogers, (1962) reports that as much as half of 228 studies on the relationship between age and innovativeness, showed that there is no relationship between age and innovativeness. This seems to suggest that the literature is inconclusive about the influence of the age factor in adoption of innovations. This may be due to the fact that the needs, situation and general perception of the various age groups in a social system in relation to innovations may differ. The influence of age in adoption (if any) may be related to other socio-economic factors such as ownership of farm lands, wealth and education. For instance a young farmer may have the best of intentions to adopt an innovation but he may be restricted by lack of capital or by the fact that he is not the owner of a farmland.

2.2.2 **Education**

Education is generally viewed as one of the important means of increasing knowledge. And education whether formal or informal, facilitates learning. Since adoption is basically a learning process, this places a high premium on education as a factor in the acceptance and adoption of innovations. For it helps the individual to develop favourable attitudes toward innovations and thus facilitates their adoption. This was the observation of Rogers (1957) when he stated that knowledge about farm practices is very important in the adoption process. For a farmer to adopt a new practice or idea, he must receive information about its existence first and then gain knowledge about the specific

details. Herein lies the importance of education in the adoption process. If the farmer is to contribute to improvement in the agricultural sector and to maintain or improve his own situation he must be well informed about new developments in other spheres of life.

Lionberger (1960) emphasized that all people are to some degree set in their ways and that the farmer who is inclined to mental rigidity tends to resort to the traditional formula of hard work, persistence and thrift in matters of farm management and production. However education being an agency of change, brings about mental flexibility. And it is the mentally flexible individual according to Lionberger (1960) that is capable of perceiving significant elements in novel situations, of dealing with them and of making adjustments readily to them. Such mentally flexible persons according to Lionberger (1960) are most certainly associated with high adoption rates.

A clear understanding of the role of education in the introduction and adoption of innovations would help resolve issues relating to how secular education of the individual contributes to his adoption behaviour and to what extent has the extension agent provided the needed education to the farmers so as to enhance their adoption of innovations?

2.2.3 **Income Level:**

The actual adoption and use of an innovation involves some cost to the farmers, for instance the initial cost of the innovation itself. As such the individual needs to have a certain level of income if he is to adopt the innovation. It is therefore natural for those who have moderate wealth and who can afford to take financial risks to be well disposed to adopt innovations more rapidly. The literature supports this. Lionberger (1960) observed that high farm incomes nearly always are associated with farm practice adoption levels. He was also of the opinion that quick adoption of sound and suited

innovation would bring improved earnings i.e increase income. The latter would in turn generate more capital that may be needed to quicken the pace of adoption of further new practices.

Fiadjoe (1987) making reference to the situation in the developing countries including Ghana, states that, farmers with limited resources tend to be the last or may never adopt the new technology at all. One of the reasons as suggested by Fiadjoe (1987) for this is that this category of farmers (farmers with limited resources) do not have the resources to purchase the required inputs. This is similar to the earlier observation by (Lionberger, 1960).

2.2.4 **Farm Size:**

Farm size is always associated with the adoption of new farm practices. And according to Lionberger (1960) the size of farm is nearly always positively related to the adoption of new farm practices. Most new technological innovations require large scale operations and substantial economic resources for their use. It is often assumed that the use of improved farm practices leads to economic benefits which in turn will induce expansion in farm operations, which in turn makes it possible to use more improved farm practices. The view generally held is that, farmers with larger farms tend to adopt more innovations than farmers with smaller farms because the larger farm holders have the economic capability to expand their operations.

2.2.5 **Tenure Status**:

A farmer may farm on his own land, or he may be a tenant farmer. Tenancy can range from lease, rent or mortgage, depending on local conditions. The kind of user or ownership right that on individual has over the farmland tends to affect the farmers decision to adopt or reject innovations. Where the farmer has individual ownership rights, he has more control over his operations than a tenant who has to rely on the good-will and willingness of the landlord to adopt certain innovations (Lionberger 1960).

2.2.6 **Source of Farm Information**

As noted earlier, for a farmer to accept a new farm practice he must be exposed to it. The exposure here implies that he must receive the relevant information about the innovation. This view was expressed by Jones (1967) when he observed that the function of advisory service is to guide planned change through education and `COMMUNICATION' (emphasis mine). He was of the opinion that if ideas are not expressed in a comprehensible manner or through the right channels the expected results would not be achieved. This assertion seeks to highlight the importance of information dissemination and sources of information in extension delivery programmes. It is not only the type of source that matters in this regard but the number of sources or number of contacts used. Hence the generally held view is that the number of sources used or number of contacts, influence adoption rates. This often raises questions as to the sources from which farmers are provided with information about innovations and how much they are exposed to these contacts or sources. Those farmers who are more exposed to outside contacts tend to have broader outlook on issues and

therefore have fewer negative characteristics which impede the acceptance of innovations. Lionberger (1960) is of the view that the number of sources used or contacts with information sources is positively related to adoption rates; and while there is positive relationship with such sources as the extension agent, research institutions, the use of relatives and friends as information sources is negatively associated with the adoption of new farm practices. The reason for this as suggested by Lionberger (1960) is that too often reliance on relatives and friends to the exclusion of more successful farmers does not appreciably expand the knowledge base of the farmer regarding the new technology. In this wise he is handicapped by lack of information to make his evaluation of the innovation.

2.2.7 **Fatalism**:

Another important individual characteristics that influences the adoption behaviour of farmers is fatalism. This relates to an individuals perception that he cannot do anything to improve his condition. He thus accepts life as it is. According to Macdonald (1976), a fatalistic individual considers himself powerless to introduce change into his operations and thus unwilling to try to change his situation. This may be brought about by certain traditional beliefs and values held by the individual. Also apathy toward innovation as a result of previous failure may contribute to the development of fatalistic tendencies. The more fatalistic an individual is the more conservative he becomes and thus unwilling to adopt innovation.

2.3 TRANSFER OF INFORMATION

Though the process of agricultural modernization depends to a large degree on the extent to which farmers incorporate into their farming operations, improved agricultural practices (innovations), to adopt such innovations, they (farmers) must FIRST (emphasis mine) be made aware of their existence, develop interest in them, and became convinced of thier relevance and usefulness (Williams and Williams, (1971). This presupposes that for the farmer to adopt innovations, information regarding the innovation must be made available to him. Jones (1963) asserts that the pace at which an innovation is disseminated is a function of the existence of appropriate media of communication which do not only inform potential users of the availability of the innovation but also the main features of such an innovation. This assertion underscores the significance of communication in any extension delivery activity. Sawhney (1967) is in agreement with the above assertion when he states that "new information is sine qua non of all attitude, changes" (Sawhney 1967:318). Sawhney (1967) maintains that the fundamental objective of any planned change such as an extension activity is attitude change. The latter can only be brought about through effective communication or through the reception of a suitable and relevant information about the attitude, object or idea that is to bring about the change.

In order to understand and appreciate the role of information delivery in the change process, one has to critically look at what communication is. Rogers (1962) defines communication as the process by which participants create and share information with one another in order to reach a mutual understanding. Lippitt (1982) is in agreement with Rogers' (1962) definition. He states that communication is a process in which "messages flowing between two parties have arrived at a stage where images and ideas which each is trying to pass to the other have the same meaning to the receiver as to the sender" (Lippitt, 1982:82). On his part, Singh (1981) defines communication as "a process

through which ideas, innovations or messages are transferred from the source to the ultimate users for modifying the behaviour of receivers in the desired direction" (Singh 1981:16). These definitions clearly point to the fact that for any dissemination or diffusion of ideas or information, certain elements or ingredients must be functional.

These elements or ingredients that make the communication process what it is according to Berlo (1960) are:

1. the source
2. the message
3. the channel
4. the recipients (Receivers)
5. the feedback.

For innovation to be adopted, the transfer or dissemination of information about the innovation must be effective. That is communication between the agent and the potential users or the target group must be effective to enhance adoption. How effective an information about an innovation must be to facilitate adoption, has been recognized to depend on the elements that are vital to the communication process itself.

Sawhney (1967) identifies five elements that determines the possibility and effectiveness of communication. These according to Sawhney (1967) are:

1. Person or group originating the message (source)
2. Content of message - that is communicated
3. Medium or media employed

4. The person receiving the message (receiver or recipient)
5. The response manifested (feed back)

All the above elements according to Sawhney (1967) are very important and the effectiveness of any information transfer can be adversely affected by the malfunctioning of any one of them. Thus those agencies that are engaged in the dissemination of information about innovations and interested in the easy adoption of such innovations must have clear understanding of these elements. Studies have shown that before they adopt innovations, farmers rely on a variety of sources of information and media. They also use these different information sources and media to different degrees and that the information sources play different roles at the different stages in the adoption process.

2.3.1 The Source (Sender) of Information

The source can be some person or a group of persons who pass on an information to the receiver. He may be the researcher, the change agent, or extension worker etc. For this study he is the extension worker and all those who interact with the farmer in the exchange of ideas about the farm enterprise. The source produces or provides the relevant stimulus to which the receiver reacts. Issues pertaining relating to "who" is communicating directly refers to the source.

As a process, the adoption and use of new ideas and techniques require different kinds of information at the different stages of the process. This may range from the initial awareness about the innovation to fully understanding it. This may be achieved by using different sources. Wilkening (1956) observed that these sources of information may rely or use personal contacts, impersonal contacts, individual and group contacts. These sources could further be distinguished as mass media,

other farmers (neighbours and relatives), educational and service agencies and commercial sources. Research has shown that mass media sources like magazines, news papers and radio programmes are frequently used at the awareness stage while other farmers (neighbours) are very influential at the decision making stage. Other farmers as a source of information, are very instrumental in influencing their colleagues in deciding whether to try out a new idea and in taking action as to when and how to put new practices into effect.

For educational and service agencies, the extension agent and other agricultural agencies are the most frequently cited source of help for learning about the technique of putting new practices into operation. The role of commercial firms involves provision of useful information in the action stage. For their role in the adoption process, they may be limited to those innovations which require the use of materials or equipment such as in the use of new fertilizers, chemicals for controlling pests and diseases and simple machines.

The sources,. as the originators or providers of messages in the communication process, greatly influence the effectiveness of the communication between them and the receivers. Berlo (1960) has identified four factors intrinsic to the sources which tend to affect the quality for that matter, the effectiveness of communication. These factors do not only affect the sources communicating behaviour but also the purpose, treatment of message and the content itself. These factors are

i) communication skills

ii) attitudes

iii) knowledge level

iv) socio cultural setting

2.3.2. The Message

The purpose for which the source is communicating is expressed in the form of a message. The message according to Berlo (1960) is the translation of the ideas, purposes and intentions of the source into a systematic set of symbols. In extension activity therefore, the message may refer to new ideas, improved practices, new methods and innovations that are transmitted to the receiver.

The message is very crucial in determining the quality of communication between the entities involved. The influence of the message in affecting the effectiveness of communication relates to the content, and how the message is treated before transmission. Treatment of the message relates to the selection and arrangement of the message codes and content so as to express the purpose of the message clearly. The content of the message relates to the specific ideas, improved practices or innovation that the communicator is transmitting. It is the material in the message that is to express the purpose of the communication. The relevance of the message to the receivers' needs, and situation is reflected to a large extent by the content.

The purpose of any communication for that matter information transfer, is to get the receiver to perform a task, to gain knowledge or to accept something. To do this effectively, Berlo (1960) suggests that three factors relating to the message must be considered. These are

1. the message codes chosen
2. the content of the message and
3. the treatment of the message

Thus in using the message factors to determine how effective communication or information transfer is in an extension delivery activity, one should consider questions relating to: what ideas are expressed or what information is transmitted and how or in what ways are the ideas or information presented?

2.3.3 **The Channel**:

No ideas or techniques can be transferred from one person to another except through certain media. These are the channels. Channels of communication can be viewed as the motor skills possessed by the source and the receiver or media which enable information to flow meaningfully between the two main actors in the communication process - the source and receiver (Berlo, 1960). The channels link the source and receiver in a reversible interaction in which ideas and information can flow from either ends. A number of media and techniques have been recognized and used as channels of communication. Rogers (1962) broadly classified these channels as media channels and interpersonal channels. In these broad groups of channels, techniques such as demonstrations, personal visits, talks, radio, news papers, bulletins, posters, etc have been recognized. These are widely used in different situations in the dissemination of information in extension delivery activities. These techniques may rely on various skills such as reading, writing, listening, speaking, touching, seeing etc for their utilization. The channels of communication are therefore indispensable in the diffusion of ideas or innovations from the source to the ultimate users; without them dissemination of information about innovations cannot take place let alone be effective. Research has indicated that the different channels perform different functions in the adoption - diffusion process. Some channels enable the idea to be heard or read while others enable a practice to be seen. Each channel is suited to a particular stage in the adoption - diffusion process. It is in this regard that Wilkening et al (1962) have observed that a farmer may hear about a new idea through one channel; learn more about it through another and learn the specific details needed to put it into practice through still another. This observation then raises the issue of what channels are appropriate for a particular message in a particular situation? This

:ks to highlight the necessity of choosing a particular channel or channels, to appeal to as many ıses as possible and ultimately making communication effective.

In communication or dissemination of information of new ideas and or innovations, it is the ;ponsibility of the communicator to decide as to what channels to use, so as to reach as many tential users as potential. This implies that he has to decide whether to use channels which can make :ssages to be seen, to be touched or to be heard. Whatever choice he makes, it is suggested that he nsiders the following if his communication is to be effective.

a) What channels are available

b) Which channels are popular with most people

c) Which channels have the most impact

d) What channels are most adaptable to the kinds of purposes at hand.

3.4 **Receivers (Recipients)**

These are the members of a social system for whom the message is intended or who receive the ıessage. They are the target of all communications. The receiver or recipients responds or reacts to /hatever stimulus (message) he receives from the source. The flow of information between the source nd recipient is regarded as being a reversible interaction or otherwise circular. As such the receiver at ne point can become the source when he sends messages in the form of his reactions to the original ource. Since the recipient is the target of all communication it is suggested that he should always be :ept in mind when messages are being developed and when channels are selected for the dissemination)f information. The reason for this according to Berlo (1960) is that the receiver has certain skills, ıttitudes, knowledge levels and comes from a particular social system, all which influence his

communication behaviour and these again influence the way he receives and interprets messages. Thus the effectiveness of communication depends on the consideration given to the recipient, in the selection of messages and channels to use in relation to his skills, attitudes, knowledge level and social setting to which he belongs. For instance if the receiver's attitude toward the source is one of dislike, what he receives will be interpreted from the background of dislike and what is actually received will not be the same as what was transmitted. This definitely makes communication ineffective.

2.3.5 **Feedback:**

This refers to the response that is elicited as a result of communication from the receiver. In other words feedback relates to the reactions or response of the receiver to the message. Communicators hope that their communication will serve its purpose and thus produce the desired results. The latter are reflected in the feedback. This underscores the importance of the feedback in any communication activity.

An effective communication must be a two-way flow. It is the feedback from the receivers that gives the indication that this two-way flow has been established or not. It is only through the feedback mechanism that any difference between what one is trying to put across and what the receiver gets can be determined. In practical terms the feedback provides the only means by which the extension worker ascertains problems of the farmer as pertains to whatever information or idea he passes on to him (farmer). Information gained from the feedback by the extension worker enables him to make the necessary corrections or adjustments to the advantage of his clientele.

2.4 OUTCOMES OF ADOPTION OF INNOVATIONS

Agricultural extension activities are designed primarily to bring about desirable changes in the clientele. It is hoped that the introduction of innovations through such extension activities would help achieve this. Thus in trying to determine the effect of extension activities, it is equally important to look at the outcomes or results that are brought about by the innovations that are promoted in such activities.

Rogers (1962) in his diffusion studies states that outcomes or consequences are the changes that occur to an individual or to a social system as a result of the adoption or rejection of an innovation. Some of these changes may affect the whole system while some may accrue to the individual. Change agencies like extension services are interested in the consequences that innovations bring to their clientele and not only the mere adoption of the innovations. It is this consideration that prompted the need to investigate the outcomes of adoption of innovations in this study.

Rogers (1962) asserts that the outcomes or consequences that are due to the introduction of innovations are varied and take many forms. He broadly classifies them into three categories as

1. Desirable and undesirable outcomes
2. Direct and indirect outcomes
3. Anticipated and unanticipated outcomes.

2.4.1 Desirable and Undesirable outcomes

The desirable outcomes or consequences are the positive changes that an innovation brings to the individual or social system while the undesirable ones are the negative changes, it brings. These

outcomes can both affect the users or adopters as well as the non adopters of the innovation. With regards to extension work, the desirable outcomes or consequences may be viewed as increased yield, higher returns, better quality products, easier ways of performing specified operations. The undesirable ones may be seen in such outcomes as deterioration in soil conditions e.g soil compaction due to mechanical plough and increased soil acidity due to excessive use of certain chemical fertilizers .

2.4.2 **Direct and indirect outcomes**

Direct outcomes or consequences are those that are brought about as a result of the direct utilization or adoption of the innovation eg. better quality crops as a result of using improved seeds. The indirect outcomes may be viewed as the "by- product" of the adoption of the innovation. They may not actually be intended for a particular innovation. For instance the introduction of contraceptive methods for family planning might lead to increased sexual promiscuity among the youth which may have undesirable consequences in society.

2.4.3 **Anticipated and Unanticipated outcomes**

The anticipated outcomes are consequences that are due to the innovations and are intended for the members of the social system adopting the innovation. The unanticipated changes or outcomes like the indirect ones, are those consequences that are unintended for the target group but are brought about by the adoption of the innovation. For instance the introduction of pesticides into agriculture may lead to food poisoning or disturbances in the food chain in the ecosystem.

MacDonald (1976) asserts that the introduction of an innovation into the client system may provoke changes in the system into which it is introduced. With extension activities, what farmers know, feel, and do with the innovation introduced to them, reflect to a large extent, the effects of such activities (Williams and Williams, 1972). For this study therefore what the farmers have gained from, know about, feel and do with the innovations introduced into their social system by the extension agents would be considered as the outcomes,for that matter,the effects of the extension activities of the agents.

CHAPTER THREE
3.0 THE STUDY AREA AND METHODOLOGY FOR DATA COLLECTION AND ANALYSIS

3.1 STUDY AREA

The study was conducted in the shallot growing areas in the Keta district in the Volta Region of Ghana. The main shallot growing areas stretches from Keta Latitude 5°55'N and Longitude 0°59'E to Anyanui on Latitude 5°47'N and Longitude 0°44'E. This area is located along a narrow littoral strip of land lying between the Gulf of Guinea to the South and the Keta Lagoon to the North (See appendix 1, map of the study area).

For effective coverage for extension purposes, the area is divided into four (4) subdistricts by the Extension Service in the district. These four subdistricts are:

1. Keta Subdistrict
2. Anloga East Subdistrict
3. Anloga West Subdistrict
4. Dzita-Anyanui Subdistrict.

(See appendix 1, map of study area). The Keta subdistrict stretches from Keta through Tegbi to Woe with the Aklobordzi Road as its western boundary. In this subdistrict however, the main concentration of shallot farmers is in the Tegbi and Woe areas.

The Anloga East subdistrict stretches from the Aklobordzi Road through Avume to the Anloga Primary Health Centre (Clinic). The Anloga West subdistrict stretches from the Anloga clinic through Atiehefe, Whuti to Atorkor. The Dzita-Anyanui subdistrict stretches from Atorkor, through Dzita to Anyanui.

In all these areas, the cultivation of shallot is restricted to the narrow strips at the Lagoon side and in the depressions on the seaward side. (Refer to Appendix 1, map of the study area for location of shallot farms).

These depressions are natural depressions which were expanded by the farmers for their farming activities. It is estimated that a total of about 3,000 acres of land is under shallot cultivation in the study area. The major economic crop grown in the study area and for which the area is well known is shallot. In addition other vegetables notably pepper, tomato, and okro are also grown in a cropping system described by the Extension Service as "Relay Cropping". In the study area, the extension field staff or the frontline staff work with contact groups of 12-15 "follower" farmers and there is an average of eight such groups in each of the subdistricts.

3.2 POPULATION OF STUDY

The population studied are farmers in the study area whose major crop is shallot and the extension field staff of the Ministry of Food and Agriculture (MOFA) stationed in the area. The farmers include both men and women who cultivate shallot as their major crop. The shallot farmers grow their shallot on well laid out beds, each measuring about 2.1m x 14.4m on the average. The number of farm beds cultivated at a time depends to a large extent on the amount of seed bulbs which a farmer has at a particular time.

Some of the farmers are illiterates while others have received formal education to various levels. They use both hired and family labour in their farming activities depending on the scale of production and volume of work at hand at a particular time. The shallot farmers cultivate beds which they acquire either through direct inheritance from parents, lease, rent or mortgage or share cropping.

The extension field staff studied are the technical officers (Frontline staff) who are in charge of the subdistricts for extension activities, the District Agricultural Officer and the Senior Technical officer in charge of extension in the district. The frontline staff are all graduates from the Agricultural colleges of the Ministry of Food and Agriculture.

3.3 SAMPLING METHOD

Two groups of farmers were selected to include extension follower farmers who belong to the extension contact groups and those who do not belong to extension contact. Since a comprehensive list of all farmers in the study area could not be prepared, the non probability sampling method was used in selecting the extension follower farmers and the other farmers. For the farmers who are in the extension contact groups, each extension agent in charge of a subdistrict was requested to direct the interviewer to a member of a group. This farmer in turn directed the interviewer to other male or female farmers. In all three farmers were selected from each group. This procedure was repeated for all the subdistricts in selecting respondent farmers in the extension contact groups.

For the farmers who do not belong to the extension contact groups, they were also selected by the non-probability sampling procedure. This was done with the help of the extension agent who first identified a farmer who does not belong to any of the extension contact groups in the subdistrict. This farmer in turn directed the interviewer to another farmer in the same category. This other farmer also directed the interviewer to another farmer. Again this procedure was repeated for all the subdistricts to cover 24 farmers who do not belong to the contact groups in each subdistrict. In deciding on the sampling procedure to use in selecting the respondents for the data collection, the Extension Officer in

the study area was contacted to seek information on how the study area is organised for extension activities and to get some information about the population of the study.

3.4 SAMPLES:

From the above procedure a sample of 192 farmers was drawn for the study. This was made up of 96 extension follower farmers from 32 extension contact groups in the study area and another 96 other farmers who do not belong to the extension contact groups. The extension follower farmers were specially identified with the help of the frontline staff in each subdistrict.

For the extension contact groups, three respondents were selected from each of the eight groups in every subdistrict. For the sample of farmers who do not belong to any of the extension contact groups, 24 respondents farmers were selected from each of the four subdistricts.

Since the extension agents are not many in the district, all the four frontline staff in charge of the sub district and their two senior officers were interviewed in the study.

Table 1: SUB-DISTRICTS AND SAMPLE SIZES

SUB DISTRICTS	EXTENSION FOLLOWER FARMERS	OTHER FARMERS	EXTENSION AGENTS	SENIOR EXTENSION OFFICERS
KETA	24	24	1	-
ANLOGA EAST	24	24	1	2
ANLOGA WEST	24	24	1	-
DZITA-ANYANUI	24	24	1	-
TOTAL	96	96	4	2

The sub districts and the sample size selected are presented in Table 1 above

3.5 QUESTIONNAIRE CONSTRUCTION AND DATA COLLECTION

Separate structured questionnaires were used to collect data from the respondent farmers and all the extension field staff. The questionnaire contained both closed and opened - ended questions. The questionnaires were developed based on the objectives of the study. Several draft copies of the questionnaires were drawn up and reviewed and revised to ensure that they do not only seek answers to the research questions but that they are also valid and reliable. This was done by making the questionnaire available to the supervisor of the study, to other lecturers of Agricultural Extension Department, Legon , and colleagues to read through and offer their criticisms and suggestions. Two questionnaires were developed, one for Extension Agents (Appendix II) and the other for farmers (Appendix III).

3.5.1 Selection and Training of Field assistants

Because of the relatively large area to be covered in the data collection, three field assistants were selected to help as field assistants in interviewing the respondents for collecting data. In recruiting the field assistants, consideration was given to their educational background and knowledge of the local geography of the area. In this regard three undergraduates who come from the study area were selected.

In training them, the assistants were briefed on the objectives of the study in order to be clear in their minds the purpose of the study. They were taken through the questionnaire question by question. This was done to ensure that they all had a common understanding of the questions. The assistants

were also taken though note taking and recording of responses. They were briefed adequately on how to relate well with the respondents to have and sustain their cooperation during the interview sessions. As part of their training the assistants were made to partake in pretesting the questionnaire on some selected farmers.

3.5.2 **The Pretest:**

Sixteen trial interviews were done by way of pretesting the questionnaire in Kportorgbe in the Anloga West subdistrict. This was done to ensure that all issues relating to the clarity of the questions to the respondents could be resolved, and also to ensure that the field assistants understood the training given them regarding conducting field interviews with questionnaires. The pretest revealed that some farmers had problems in answering four of the items in the questionnaire. These questions were modified. The trial interviews also gave an indication of the suitable time of the day when it would be convenient to meet most farmers at home for the interviews. (Most farmer leave very early to farm and return around 10am and leave again around 2 pm for the farm).

3.5.3 **The Main Interviews:**

The main interviews to collect data were conducted between September and November 1995. In all, one hundred and ninety-two farmers and six extension field staff were interviewed during the main interview with separate questionnaires. The interviews for the respondent farmers did not start earlier than 10am and did not extend later than 3 pm each day since it is during this time of the day that most farmers were available at home for the interview. All the respondent farmers were interviewed at

their homes while the frontline staff and their two senior officers were interviewed at the District Extension Office. Other relevant secondary data on extension activities in the study area were collected from the staff during the interviews.

3.6 DATA ANALYSIS

The responses were qualitatively analysed with statistical analysis of the study being limited to percentage frequency distribution and cross tabulation in an attempt to present the results of the study in a simple non-technical manner. It is hoped that in this way the results could be simply understood.

Before the actual analysis was done, the information obtained from the respondents (both farmers and extension staff) was edited by reading through each questionnaire critically. A coding guideline was developed and used in coding the data. The data were computer analysed at the Institute of Social, Statistical and Economic Research (ISSER), Legon.

The data was analysed to bring out information on the innovations introduced, the method and nature of information delivery used in introducing the innovations and the outcomes and changes brought about by the introduction of the innovations.

On the innovations, the data provided was analysed for what the respondents, both shallot farmers and extension agents consider as innovations introduced into the shallot farming in the district. From this, comparisons were made between what the farmers consider as innovations and what the extension agents consider as innovations. The various sources from which the innovations were introduced to the farmers were determined from the responses and from this, those innovations introduced by the extension service and those that came from sources other than extension were determined.

Analysis was made to show sources of innovations on one hand and the method and nature of information delivery about the innovations on the other hand. The data was further analysed to show reasons put forward by the respondents for stopping usage of some of the innovations they have used before. Finally the benefits or outcomes derived by the farmers from the innovations and how they rated the innovations in relation to their farming was analysed.

On information delivery and Extension teaching methods, the data collected was analysed for the sources from which the farmers get information on farming matters and how they rated these sources of information. Also the methods used in teaching them about the innovations and how the shallot farmers rated these methods were determined from the information provided in the data. From the data collected from the extension agents, analysis was made to bring out the factors or conditions they consider when selecting extension teaching methods for their extension work and the reasons why they most often used a particular extension teaching method.

On the benefits and outcomes on the acceptance and use of innovations, the data was analysed to determine the changes occuring in the shallot industry and also changes occuring to the individual farmers were determined. From the demographic data collected, analysis was made to show how the various ownership right over farm beds influence the shallot farmers; decisions to adopt innovations.

3.7 LIMITATIONS OF THE STUDY

The inability to use a standard measure to determine the effects of extension activities is a limitation to this study. However according to Baxter, Slade, and Howell (1989) no such standard

measure existed by which impact or effects of extension can be measured successfully. According to Baxter et al. (1989).

> "It is not possible to determine what proportion of benefits are due to extension alone and what are due to additional purchased inputs and other factors. It is a combination of a number of factors with extension playing the role of catalyst that bring desired benefit".

Extension can be held responsible for the objectives it sets in its programmes - in terms of changes in knowledge, attitude and practices - but partially responsible for overall development of the area.

Questions had to be translated to the respondent farmers in the local language since most of them were illiterates and their responses had to be translated into English by the interviewers. These translations are bound to bring some distortions in the farmers understanding of the questions and in the responses they provide. Farmers who have very close and good relationship with extension agents may not be willing to express negative sentiments for the fear of being accused of ungratefulness; or due to a concern that their answers would not be kept confidential. Attempt was made to dispel doubts about the confidentiality of the responses.

The reliability of some of the respondents' answers may be open to questions because of the memory work involved especially for questions to which the respondents were to state the time or duration of use of the adopted innovations. To circumvent some of these problems respondents were encouraged to associate some of such responses to certain events which they could not readily forget.

CHAPTER FOUR

4.0 FINDINGS

The findings as presented in this chapter are divided into four (4) main sections namely:

1. Description of respondent farmers
2. Innovations introduced
3. Extension methods and information delivery about innovations
4. Outcomes or changes brought by the innovations

The first section gives a brief description of the respondent farmers with regards to their age and sex distribution, level of education, farm size (number of farm beds cultivated), ownership right over the farm beds cultivated and additional occupation.

The second section concerns what the respondent farmers and the extension agents in the study area consider as innovations introduced into the shallot farming in the Anloga area. The third section deals with the teaching methods used in introducing or teaching the innovations to the respondent farmers; and the methods by which the shallot farmers acquire or get information about the innovations and farm matters in the study area.

The fourth section is concerned with the outcomes or consequences brought by the use of the innovations in the shallot farming in the study area. In this section the benefits derived by the respondents farmers from the use of the innovations are reported. In addition, the personal changes that the respondents had are also reported.

4.1 DESCRIPTION OF RESPONDENT FARMERS

In this section the characteristics of the respondent farmers with regard to their age, sex, level of education, farm size and the types or kinds of ownership titles or tenurial rights they have over the farm beds they cultivated, are presented. This section also indicates the type of additional occupations which some of the respondent farmers engaged in, in the study area.

4.1.1 Age of respondents farmers

A total of one hundred and ninty-two (192) shallot farmers made up of 96 extension follower farmers and 96 other farmers were interviewed. A majority of the extension followers farmers were between the ages of 26 and 57 years. Thirteen of the extension followers farmers however gave their ages to be over 57 years. The ages for the majority (93.8%) of the other farmers were between 18 and 57. Table 2 below gives the age distribution of the farmers.

TABLE 2: AGE DISTRIBUTION OF FARMERS IN YEARS.

	RESPONDENTS			
	EXTENSION FOLLOWER FARMERS		OTHER FARMERS	
AGE RANGE (YEARS)	Frequency	%	Frequency	%
18-25	0	-	3	3.1
26-33	9	9.3	16	16.7
34-41	26	27.1	18	18.7
42-49	30	31.3	29	30.2
50-57	18	18.8	24	25.0
Over 57	13	13.5	6	6.3
Total	96	100	96	100.0

4.1.2 Level of Education of farmers

Table 3 below gives the level of education of the respondent farmers.

TABLE 3: LEVEL OF EDUCATION OF THE SHALLOT FARMERS

	RESPONDENTS			
Educational Level	EXTENSION FOLLOWER FARMERS		OTHER FARMERS	
	Frequency	%	Frequency	%
NIL	29	30.2	25	26.0
PRIMARY	13	13.5	18	18.8
MIDDLE/JSS	33	34.4	40	41.7
SECONDARY SCHOOL OR TECHNICAL SCHOOL	18	18.8	13	13.5
UNIVERSITY	3	3.1	-	-
Total	96	100	96	100.0

Majority of the extension follower farmers have had formal education ranging from primary to the University level while the majority of the other farmers have had education ranging from primary to secondary/technical. None of the other farmers has University education. However while twenty-nine (30.2%) of the extension follower farmers were illiterates, a (26.0%) of the other farmers were also illiterates.

4.1.3 Number of farm Beds cultivated

The distribution of the number of farm beds cultivated with shallot in a season is presented in Table 4 below.

TABLE 4: NUMBER OF BEDS CULTIVATED BY FARMERS

	RESPONDENTS			
	EXTENSION FOLLOWER FARMERS		OTHER FARMERS	
NO. OF BEDS CULTIVATED	Frequency	%	Frequency	%
Below 20 beds	5	5.2	12	12.5
20 - 30 beds	16	16.7	33	34.4
Above 50 bed	75	78.1	51	53.1
Total	96	100	96	100

Table 4 reveals that while about a third (34.4%) of the other farmers cultivated between 20-30 beds only 16.7% of the extension follower farmers cultivated between 20-30 beds. However Table 4 further shows that majority of the farmers (78.1% of the extension follower farmers and 53.1% of the other farmers) cultivated more than 50 beds per a season. They could thus be classified as large scale farmers.

4.1.4 Ownership Right over Beds Cultivated

The types of ownership rights or titles that extension follower farmers had over the beds they cultivated are presented in Table 5, that of the other farmers are presented in Table 6 below.

TABLE 5: LAND OWNERSHIP RIGHTS HELD BY THE EXTENSION FOLLOWER FARMERS

TYPES OF OWNERSHIP RIGHTS	FREQUENCY	%
Inheritance from parents	12	12.5
Inheritance and mortgage	7	7.3
Inheritance and renting	7	7.3
Inheritance, mortgage and lease	12	12.5
Inheritance, mortgage, lease and renting	10	10.4
Mortgage, renting, and lease	8	8.4
Inheritance, mortgage, renting, lease and sharecropping	7	7.3
Inheritance, mortgage and renting	6	6.4
Lease and sharecropping	3	3.1
Inheritance, mortgage and sharecropping	3	3.1
Lease and Renting	3	3.1
Mortgage and renting	2	2.1
Mortgage and lease	2	2.1
Mortgage only	2	2.1
Inheritance, renting, lease and sharecropping	4	4.2
Mortgage, renting and sharecropping	2	2.1
Mortgage, renting, lease and sharecropping	1	1.0
Mortgage, lease, and sharecropping	1	1.0
Renting alone	1	1.0
Mortgage and sharecropping	1	1.0
Renting and sharecropping	1	1.0
Inheritance, mortgage, renting and sharecropping	1	1.0
Total	96	100.0

Except for 12.5% of the extension follower farmers who owned beds by inheritance only, and 2.10% who owned beds by mortgage only, and 1.0% who owned beds by renting only as shown in

Table 5 above majority (84.4%) of the extension follower farmers had more than one ownership right over beds cultivated. For instance, while 12.5% of the extension follower farmers owned their beds by inheritance, mortgage and lease, 10.4% owned their beds by inheritance, mortgage, lease and renting. Also while 8.4% of the extension follower formers owned beds by mortgage, renting and lease, 7.3% of the extension follower farmers owned beds by inheritance, mortgage renting, lease and share cropping.

A shallot farmer who has sufficient seed stock, normally rents beds from another farmer or owner of beds who may not have seed stock at all or may not be cropping some of his beds in a particular season. On the other hand, in cases of financial hardships, farmers who have farm beds of their own, do mortgage some of their beds to other farmers. As such a farmer may cultivate some beds that are inherited from parents, some that are rented to him or mortgaged to him. All these beds he could cultivate in the same season by working on them in turns.

Also as shown in Table 6 below, majority of the other farmers (78.1%) had more than one ownership right over the beds they cultivated. For instance while 9.4% of the other farmers cultivated only inherited beds, 7.3% of them cultivated only rented beds. However while 17.7% of the other farmers cultivated inherited, mortgaged and rented beds, 10.4% of them cultivated inherited, mortgaged, rented and leased beds, 10.4% of them cultivated inherited, mortgaged, rented and lease beds.

TABLE 6: LAND OWNERSHIP RIGHT HELD BY OTHER FARMERS

TYPES OF OWNERSHIP RIGHTS	FREQUENCY	%
Inheritance from parents	9	9.4
Inheritance and mortgage	7	7.3
Renting	7	7.3
Inheritance and Renting	6	6.3
Renting and mortgage	6	6.3
Inheritance, mortgage and Renting	17	17.7
Inheritance ,mortgage, Renting and Lease	10	10.4
Inheritance, mortgage and Lease	8	8.3
Interitance, mortgage, renting, lease and sharecropping	5	5.2
Lease and Renting	4	4.2
Mortgage only	4	4.2
Mortgage and Lease	3	3.1
Mortgage, Renting and Lease	3	3.1
Renting, Lease and and sharecropping	2	2.1
Renting and sharecroping	1	1.0
Inheritance, mortgage and sharecropping	1	1.0
Mortgage, Renting and sharecropping sharecropping	2	2.1
Sharecroping only	1	1.0
Total	96	100.0

4.1.5 **Influence of Ownership rights on the use of Innovations by Farmers**

Farmers responses as to whether the type of ownership right limits their use of innovations is presented in Table 7 below

TABLE 7: OWNERSHIP RIGHTS AND THE USE OF INNOVATIONS BY SHALLOT FARMERS

LIMITATIONS ON USE OF INNOVATIONS ON BEDS (EXTENSION FOLLOWER FARMERS)	FREQUENCY	%
Ownership right does not limit use of innovations on beds	94	97.9
Ownership right limits use of innovations	2	2.1
Total	96	100.0
LIMITATIONS ON ON USE OF INNOVATIONS ON BEDS (OTHER FARMERS)	F	%
Ownership right does not limit use of innovations on beds	93	96.9
Ownership right limits use of innovations	3	3.1
Total	96	100.0

Almost all the farmers both extension follower farmers and other farmers said they freely used innovations for all the beds they cultivated irrespective of which ownership title or right they had over the beds. In other words ownership of beds either by inheritance, mortgage renting or sharecropping does not limit the use of innovations. However two (2.1%) extension follower farmers and three (3.1%) other farmers said ownership right limit their used of innovations. Specifically they mentioned rented and leased beds. These few farmers explained that for their rented or leased beds, they reduce the quantum of such items as chemical fertilizers and organic manure, more so when the owner of such beds intercrops their shallot with other crops.

4.1.6 Additional occupation of Farmers

Thrity-five (36.5%) of the extension follower farmers and thirty-four (35.4%) of the other farmers had additional occupation to their shallot farming. However 61 (63.5%) of the extension follower farmers and 62 (64.6%) of the other farmers said they did not have any additional occupation. The distribution of the additional occupation of the farmers are presented in Table 8 below.

TABLE 8: DISTRIBUTION OF THE ADDITIONAL OCCUPATION OF SHALLOT FARMERS

	RESPONDENTS			
	EXTENSION FOLLOWER FARMERS		OTHER FARMERS	
TYPES OF ADDITIONAL OCCUPATION	Frequency	%	Frequency	%
Artisan	21	60	27	79.4
Trading	6	17.1	4	11.8
Public Servant	3	8.6	3	8.8
Rearing Animals	5	14.3	-	-
Total	35	100.0	34	100.0

As shown in Table 8 above, majority (60%) of the extension follower farmers and 79.4% of the other farmers who had additional occupation were artisans. Ten of the farmers made up of six extension follower farmers and four other farmers said they did petty trading in addition to their shallot farming. Six farmers made up of three each of extension followers farmers and other farmers are public servants, while five extension follower farmers engaged in rearing of animals (small ruminants) as additional occupation to the shallot farming.

On whether the additional occupation contributed to the adoption and use of innovations introduced to them, thirty-four (97.1%) of the extension follower farmers and thirty-one (91.2%) of the other farmers who had additional occupation, mentioned that the additional occupation helped them in the use of the innovations. Only one extension follower farmer and three other farmers stated that the additional occupation did not in any way help them in the use of the innovations.

The contribution of the additional occupations of the farmers to the adoption and use of innovations are presented in Table 9 below.

TABLE 9: CONTRIBUTION OF ADDITIONAL OCCUPATION TO USE OF INNOVATIONS BY SHALLOT FARMERS

	RESPONDENTS			
	EXTENSION FOLLOWER FARMERS		OTHER FARMERS	
CONTRIBUTION OF ADDITIONAL OCCUPATION	Frequency	%	Frequency	%
Extra income to procure innovations	33	97.1	31	100
Reading for Information from textbooks	1	2.9	-	-
Total	34	100	31	100.0

As shown in Table 9 above, 97.1% of the extension follower farmers and all the other farmers who mentioned that their additional occupations contributed to the adoption of innovations, said the extra income earned from their additional occupations helped them in procurement and use of the innovations. One of the extension follower farmers mentioned that his additional occupation made it possible for him to read about about innovations from textbooks.

4.2 INNOVATIONS INTRODUCED

This section deals with the meaning or understanding of innovations as given by the respondent farmers and extension agents, the types of innovations introduced into shallot farming, and the aspects of the shallot farming into which the innovations were introduced. In this section the various sources from which the innovations were introduced to the farmers and the sources from which the farmers received information on or about innovations are also reported. The appropriateness of the introduced innovations is also presented in this section.

4.2.1 Meaning/Understanding of Innovations

On what the farmers and the extension agents consider or understand as innovations, 189 (98.4%) out of the 192 respondent farmers, made up of 93 extension follower farmers and 96 other farmers said they regarded those things they were not using formerly or before in their farming as innovations. Two extension follower farmers stated that innovations are those items or things which help them to increase yield. (See table 10 below).

Table 10: FARMERS' UNDERSTANDING OF WHAT IS AN INNOVATION

EXTENSION FOLLOWER FARMER'S UNDERSTANDING OF WHAT IS AN INNOVATION	F	%
Things farmers were not using formerly	93	96.9
Things that help to increase yield	2	2.1
Things that help to reduce diseases	1	1.0
Total	96	100.0
OTHER FARMERS' UNDERSTANDING OF WHAT IS AN INNOVATIONS'	F	%
Things farmers were not using formerly	96	100
Total	96	100.0

As indicated below in Table 11, three (50%) of the extension agents said that innovations are new methods and techniques used by farmers with advice from technical (agricultural) officers, while 33% of the agents stated that innovations are the practices that farmers were not using before, while one (16.7%) said that innovations are things that bring about increased production.

Table 11: EXTENSION AGENTS' UNDERSTANDING OF WHAT IS AN INNOVATION

UNDERSTANDING OF INNOVATION	Frequency	%
1. New methods and techniques used by the farmers with advice from Technical officers	3	50
2. Practices farmers were not using before	2	33.3
3. Things that bring about increased production	1	16.7
Total	6	100.0

4.2.2 **Types of Innovations Introduced**

Table 12 below shows the innovations which the farmers indicated as having been introduced into the shallot farming in the study area over the last 15 years.

TABLE 12 :TYPES OF INNOVATIONS INTRODUCED TO FARMERS

INNOVATIONS INTRODUCED TO EXTENSION FOLLOWER FARMERS	Frequency	%
Fertilizer, Insecticide and spraying machine	44	45.9
Fertilizer, Insecticide, spraying machine and water pumps	15	15.6
Fertilizer, Insecticide, spraying machine, poultry manure	5	5.2
Fertilizer and Insecticide	13	13.5
Others:	19	19.8
Total	96	100
INNOVATIONS INTRODUCED TO THE OTHER FARMERS		
INNOVATIONS	F	%
Fertilizer and Insecticide	12	12.5
Fertilizer, Insecticide and spraying machine	49	51.0
Fertilizer, Insecticide, spraying machine and water pumps	20	20.3
Fertilizer, insecticide and water pump	5	5.2
Fertilizer only	1	1.0
Others	9	9.4
Total	96	100.0

Innovations that have been introduced to both the extension follower farmers and the other farmers are insecticides, spraying machine, use of water pumps for upland cultivation of shallots and use of poultry manure. As shown in Table 12 above, 45.9% of the extension contact farmers were introduced to fertilizers, insecticides and spraying machine while 15.6% were introduced to fertilizers, insecticides, spraying machine and water pumps. While 13.5% of the extension follower farmers were introduced to Fertilizers and insecticides only. Also in addition 19.8% were introduced to other innovations such as seed bulb treatment with chemicals, Farmers' day celebration, fungicides and reduced stirring of soil and zoning of localities .

Only one of the other farmers received a single innovation i.e fertilizer, the rest were introduced to more than one innovation. Table 12 shows that 51% of the other farmers were introduced to fertilizers, insecticides and spraying machine, while 20.8% were introduced to fertilizers,

insecticides, spraying machine and water pumps. In addition nine (9.4%) of the other farmers were introduced to the innovations like fungicides, seed treatment onion cultivation and green manuring.

The innovations which the extension agents indicated they had introduced in the study area during the Volta Region Agricultural Development Project (VORADEP) era i.e. 1982-87 are presented in Table 13 below.

TABLE 13: INNOVATIONS INTRODUCED BY EXTENSION AGENTS TO SHALLOT FARMERS DURING VORADEP/1982-87)

INNOVATIONS	Frequency	%
Fertilizer, Insecticide, spraying machine and seed treatment	2	33.3
Use of spraying machine	1	16.6
Green manuring, composting, insecticides and spraying machine	2	33.3
Insecticides and Fertilizer	1	16.7
Total	6	100.0

As indicated in Table 13 above, the extension agents gave advice on use of fertilizers, Insecticides, spraying machine, seed treatment, green manuring, compositing as innovations which they introduced into the shallot farming during the VORADEP period. Two out of the six extension agents said they introduced fertilizers, insecticides, spraying machine and seed bulb treatment while one extension agent introduced only the use of spraying machine. Another two extension agents introduced green manuring, composting, insecticides and spraying machine and one extension agent each introduced insecticides and the use of fertilizers.

After the VORADEP era i.e after 1987, as shown in Table 14 below, two extension agents said they introduced only fungicides while one extension agent introduced line/row planting of shallot. While another two extension agents introduced the use of fertilizers, line planting of shallot and use of chemicals other than DDT, one agent also introduced the use of chemicals other than DDT, fungicides, herbicides, mechancial irrigation, quarantine clearance and spraying machine.

TABLE 14: INNOVATION INTRODUCED BY THE EXTENSION AGENTS AFTER VORADEP

INNOVATIONS	Frequency	%
Use of fungicides only	2	33.3
Line planting of shallot	1	16.7
Fertilizers, Line planting of shallot and use of chemicals other than discouraging use of DDT	2	33.3
Discouraging use of DDT, Fungicides, herbicides mechanical irrigation, Quarantine Clearance and spraying machine	1	16.7
Total	6	100.0

4.2.3 Advice Farmers Received from Extension

When the respondent farmers were asked to indicate whether they had any contact with the extension services in the study area, ninety (93.7%) of the extension follower farmers agreed that they had contact with extension while the remaining six (6.3%) said they did not. Seventy-six (79.2%) of the other farmers had not had any contact with extension while twenty of them (20.8%) stated that they had had some contact with extension services before. Thirty-six (40%) of the extension follower farmers who had contact with extension received advice from externsion on improving their shallot

arming. For the other farmers who had contact with extension, six (30%) agree that they received some advice from extension on improving the shallot farming.

The frequency distribution of the pieces of advice that the thirty-six extension follower farmers and the six other farmers received from the extension agents are presented in Table 15 below.

TABLE 15: KINDS OF ADVICE THE FARMERS RECEIVED FROM EXTENSION ON IMPROVING SHALLOT FARMING.

KINDS OF ADVICE RECEIVED (EXTENSION FOLLOWER FARMERS)	Frequency	%
Formation of groups	9	25.0
Maintaining contact with Extension	3	8.3
Adoption of good farming practices	21	58.3
Finding export potential for shallot	1	2.8
Diversification	2	5.6
Total	36	100.0
THE KINDS OF ADVICE RECEIVED (OTHER FARMERS)	Frequency	%
Formation of groups	1	16.7
Maintaining contact with Extension	1	16.7
Adoption of good farming practices	3	50
Diversification	1	16.6
Total	6	100.0

As shown in Table 15, majority (58.3%) of the extension extension follower farmers who received advice from the extension services on improving their shallot farming said that they were advised on the adoption of good farming practices. A quarter of these farmers said they were advised on the formation of farmers groups.

Out of the six other farmers who received advice from the extension agents on improving their shallot farming, half said they were advised on the adoption of good farming practices while one each said they were advised on group formation, maintaing regular contact with extension and how to diversify their shallot cultivation.

4.2.4 Aspect of Farming into which Innovations were Introduced

In Table 16 below, the frequency distribution of the extension agents response on the aspects of shallot farming into which they have introduced innovations is presented. Majority of the extension agents (83.3%) stated that the innovations they introduced were in areas of crop protection, soil management, storage of seed bulbs and mode of planting. Only one extension agent stated that he introduced innovation in the area of irrigation.

TABLE 16: ASPECTS OF SHALLOT FARMING INTO WHICH INNOVATIONS WERE INTRODUCED BY EXTENSION AGENTS

ASPECTS OF FARMING INTO WHICH INNOVATIONS WERE INTRODUCED	Frequency	%
Crop protection, soil management, and storage of seed bulbs	3	50.0
Crop protection, soil management and mode of planting	2	33.3
Irrigation	1	16.7
Total	6	100.0

The aspects of shallot farming in which the innovations have been introduced as indicated by the farmers themselves are presented in Table 17 below.

TABLE 17: THE ASPECTS OF SHALLOT FARMING INTO WHICH INNOVATIONS WERE INTRODUCED AS INDICATED BY FARMERS

THE ASPECTS OF SHALLOT FARMING (EXTENSION FOLLOWER FARMERS)	Frequency	%
Soil management and crop protection	70	73.0
Soil management, crop protection and irrigation	17	17.7
Soil management, crop and protection and landuse	3	3.1
Irrigation and crop protection	2	2.1
Soil managment only	1	1.0
Crop protection only	3	3.1
Total	96	100.0
ASPECT OF SHALLOT FARMING (OTHER FARMERS)	Frequency	%
Soil management and crop protection	67	69.8
Soil management crop protectijon and Irrigation	22	23.0
Soil management, crop protection Irrigation and Land Use	2	2.1
Soil management and Irrigation	1	1.0
Soil management only	2	2.1
Land use only	1	1.0
Irrigation and crop protection	1	1.0
Total	96	100.0

As shown in the Table 17 above both groups of farmers stated that innovations introduced to them were in the areas of soil management, crop protection, irrigation and land use.

Majority of the farmers made up of 73% extension follower farmers and 69.8% of the other farmers stated soil management and crop protection as the aspects of shallot farming in which innovations have been introduced. Soil management, crop protection and irrigation as aspects of shallot farming in which innovations have been introduced, were stated by 17.7% extension follower farmers and 23% other farmers.

The results thus show that aspects like mode of planting shallot, seed bulb storage which were indicated by the extension agents were not reported by the farmers. On the hand the farmers indicated land use which was not mentioned by the extension agents.

4.2.5 Sources of Innovations

The farmers were asked to indicate the various sources from which they were introduced to the innovations. Table 18 below gives the innovations and the source from which they were introduced to the farmers.

TABLE 18: INNOVATIONS AND THE SOURCES FROM WHICH THEY WERE INTRODUCED TO THE EXTENSION FOLLOWER FARMERS AS INDICATED BY THEM

INNOVATIONS AND SOURCES	Frequency	%
Fertilizer - farmer friends	26	29.2
Fertilizer - FASCOM/Sellers of farm Inputs	19	19.1
Fertilizer - Extension Agents	46	51.7
Insecticides - farmer friends	24	26.4
Insecticides - FASCOM/Sellers of farm Inputs	17	18.7
Insecticides - Extension Agents	50	54.9
Spraying Machine - farmer friends	38	46.9
Spraying Machine - FASCOM/Sellers of Inputs	13	16.1
Spraying Machine - Extension agents	30	37.0
Water pumps - farmer friends	12	66.7
Water pumps - extension agents	6	33.3
Onion Cultivation - farmer friends	2	66.7
Onion cultivation - Extension Agents	1	33.7

The innovations were introduced to the extension follower farmers from several sources. Table 18 above reveals that of the 89 extension follwer farmers who were introduced to fertilizers, 29.2% had it from farmer friends while 51.7% were introduced to it by extension agents. Seventeen (19.1%) of the extension follower farmers who were introduced to fertilizers had it from FASCOM or sellers of farm inputs.

Ninety-one (94.8%) of the extension follower farmers were introduced to insecticides. Of this figure 54.9% were introduced it by the extension agents while 26.4% introduced to it by farmers friends and 18.7% were introduced it from FASCOM or sellers of farm iputs.

Eighty-one extension follower farmers were introducded to spraying machine. Of this number, 46.9% had it from farmer friends while 37% had it from the extension agents. Only 16.1% were introduced to it by FASCOM or sellers of farm inputs. Out of the 18 extension follower farmers who were introduced to the use of water pumps, 12 (66.7%) had it from farmers friends with the remaining six (33.3%) introduced to it by the extension agents. Only one extension follower farmer each was introduced to insecticides and fertilizers through reading of extension publications.

TABLE 19: INNOVATION AND THE SOURCES FROM WHICH THEY WERE INTRODUCED TO THE OTHER FARMERS AS INDICATED BY THEM

INNOVATIONS AND SOURCES	Frequency	%
Fertilizer - farmer friends	47	49.5
Fertilizer - FASCOM/Sellers of Farm Inputs	29	30.5
Fertilizer - Extension Agents	19	20.0
Insecticides - farmer friends	41	42.4
Insecticides - Extension Agents	18	18.8
Insecticudes - FASCOM/Sellers of Farm Inputs	37	38.8
Spraying Machine - farmer friends	49	67.2
Spraying Machine - Extension Agentss	9	12.3
Spraying Machine - FASCOM/Sellers of Farm Inputs	15	20.5
Water pumps - farmer friends	26	83.9
Water pumps - Extension agents	2	6.5
Water pumps - FASCOM/Sellers of Farm Inputs	1	3.2
Water pumps - Self	1	3.2
Water pumps - NGOS (WVI)	1	3.2

Table 19 above shows that 95 (99.0%) of the other farmers were introduced to fertilizers from three main sources namely farmer friends, FASCOM/sellers of farm inputs and extension agents. Of this figure, 49.5% were introduced to it by farmer friends, 30.5% by FASCOM/sellers of inputs and 20% by the extension agents. All the 96 other farmers were also introduced to insecticides through the three main sources namely farmer friends, FASCOM/sellers of farm inputs and Extension agents. Of this figure, 42.4% were introduced to it by farmer friends, 38.8% by FASCOM/sellers of farm inputs and 18.8% from the extension agents.

Seventy-three (76%) of the other farmers were introduced to use of spraying machines. Of this figure, 67.2% were introduced to it by farmer friends 12.3% by extension agents and 20.5% from FASCOM sellers of farm inputs. Majority (83.9%) of the other farmers who were introduced to the use of water pumps, were introduced to it by farmer friends. While only two (6.5%) were introduced to it by Extension agents, one (3.2%) was introduced to it by World Vision International (WVI) an NGO.

The sources from which the farmers received information on farming matters are also presented in Table 20 below.

TABLE 20: SOURCE OF INFORMATION ON FARMING MATTERS TO THE SHALLOT FARMERS

THE SOURCES OF INFORMATION (EXTENSION FOLLOWER FARMERS)	Frequency	%
Farmer friends	24	25.0
Other farmers and Extension Agents	27	28.1
Other farmers, FASCOM and Extension Agents	29	30.2
Other farmers and FASCOM	10	10.4
Extension agents only	2	2.1
Other farmers and Radio	2	2.1
Books/Publications	2	2.1
Total	96	100.0
SOURCES OF INFORMATION ON FARMING MATTERS TO THE OTHER FARMERS		
THE SOURCES OF INFORMATION	Frequency	%
Farmer friends	43	44.8
Farmer friends and sellers	33	34.4
Farmer friends and Extension agents	16	16.7
Books and Publications	3	3.1
Farmer friends and Publications	1	1.0
Total	96	100.0

Like the sources of innovations, the farmers stated that they recieved information on farming matters from three main sources, namely, farmer friends, extension agents, and FASCOM/sellers of farm inputs. As shown in Table 20 above, a quarter of the extension follwer farmers received information on farming generally from farmer friends only whilst 28.1% received information from farmer friends and extension agents. And while only two of the extension follower farmers received information from the extension agents only, 30.2% received information from farmer friends, FASCOM and extension agents. Two extension follower farmers each received information on farming from the radio and publications. Table 20 also shows that while most of the other farmers (44.8%) received information on farming from farmer friends only, about a third (34.4%) received information on farming from their farmer friends and FASCOM/sellers of farm inputs. Only 16.7% of the other farmers received information from farmer friends and the extension agents. Four (4.1%) of the other farmers obtained information on farming from publications.

4.2.6 **Appropriateness of Innovations**

Table 21 below gives the farmers' perception of the apppropriateness or otherwise of the main innovations introduced to them.

TABLE 21: RATING OF INNOVATIONS BY THE SHALLOT FARMERS

(EXTENSION FOLLOWER FARMERS)	APPROPRIATE		INAPPROPRIATE	
INNOVATIONS	F	%	F	%
Fertilizer	89	100.0		
Insecticides	90	98.9	1	1.1
Spraying machine	79	97.5	2	2.5
Water Pump	18	100		
(OTHER FARMERS)	APPROPRIATE		INAPPROPRIATE	
INNOVATIONS	F	%	F	%
Fertilizer	93	97.9	2	2.1
Insecticide	96	100		
Spraying machine	71	97.3	2	2.7
Water pump	28	93.3	2	6.7

Table 21 shows that all the extension follower farmers to whom fertilizers were introduced, rated them as appropriate. Only one out of the ninety-one extension follower farmers to whom insecticides have been introduced rated it as inappropriate, while only two out of the 81 extension follower farmers rated spraying machines as inappropriate. The use of water pumps for the upland cultivation of shallot is appropriate to all the extension follower farmers to whom it was introduced.

With the other farmers, the results show that, fertilizer was appropriate to 97.9% of the farmers to whom it was introduced. All the other farmers found insecticides appropriate while 97.3% of the other farmers rated spraying machine appropirate with only 2.7% of the other farmers rating it inappropriate. While 93.3% of the other farmers to whom water pumps was introduced rated it as appropriate,only two of the farmers (6.7%) rated water pumps as inappropriate.

The frequency distribution of the adopted innovations, discontinued by the extension follower farmers and the other farmers and the reasons for their stoppage are presented in Table 22 below.

TABLE 22: ADOPTED INNOVATIONS DISCONTINUED BY THE FARMERS

INNOVATIONS STOPPED AND REASONS FOR STOPPAGE (EXTENSION FOLLOWER FARMERS)	Frequency	%
Spraying machine - Difficulty in maintenance and use	2	2.1
Fungicide - No longer needed	1	1.0
	93	96.9
Total	96	100.0
INNOVATIONS STOPPED AND REASONS FOR STOPPAGE (OTHER FARMERS)		
INNOVATIJONS - REASONS FOR STOPPAGE	F	%
Insecticides - Non availability	3	3.1
Water pump - High cost of maintenance	2	2.1
Spraying machine - Difficulty in maintrenance	2	2.1
Poultry Manure - Damage to crops	1	1.0
Fertilizers - Deterioration of Seed bulbs	1	1.0
Fungicide - No longer needed	1	1.0
No stoppage -	86	89.7
Total	96	100.0

The results show that for all the innovations that the extension follower farmers have used before, it is only spraying machine and fungicide that some of them have discontinued using. Few of the other farmers have also discontinued using insecticides, water pump, spraying machine etc.

The results further show that the two extension follower farmers who stopped using spraying machines, gave difficulty in maintenance and use as the reasons for discontinued of use. The only one extension follower farmer who discontinued using fungicides, said he no longer needed it. (The situation that warranted its use, no longer existed on the farm).

With the other farmers, the three farmers who discontinued using insecticides, gave non availability of the chemicals as the reason for their stoppage while high maintenance cost was the reason given by the two farmers who discontinued using water pumps. Two other farmers discontinued using spraying machine and gave difficulty in maintenance as the reason for their stoppage. The use of chemical fertilizers was discontinued by one other farmer because it causes the deterioration of seed bulbs.

In Table 23 below is presented the extension agents response on whether all the farmer they worked with adopted innovations introduced to them or not.

Table 23: FARMERS' ADOPTION OF INNOVATIONS AS INDICATED BY THE EXTENSION AGENTS

All farmers worked with adopted innovations	Frequency	%
Yes	0	
No	6	100
Total	6	100

The results show that all the extension agents stated that not all farmers they worked with adopted or accepted the innovations they (extension agents) introduced to them. The frequency distribution of the reasons given by the extension agents as to why all the farmers they worked with, did not adopt the innovations introduced to them are presented in Table 24 below.

TABLE 24: REASONS FOR NON ACCEPPTANCE OF INNOVATIONS BY THE SHALLOT FARMERS AS INDICATED BY EXTENSION AGENTS

REASONS FOR NON ACCEPRTANCE OF INNOVATIONS	Frequency	%
Lack of money	2	33.3
Conservatism (Unwillingness of farmers to change)	3	50.0
Access to other sources for Inputs	1	16.7
Total	6	100.0

Half of the extension agents (50%) gave what they termed as conservatism (unwillingness of farmers to adopt) as one of the reason why some of the farmers failed to adopt the innovations. According to two (33.3%) of the extension agents, lack of money on the part of the farmers was another reason why some farmers did not adopt innovations introduced to them. One extension agent (16.7%) said that the farmers had other `Unofficial' sources for farm inputs and this prevented them from approaching extension agents to discuss problems relating to innovations.

When the extension agents were asked to indicate whether all the farmers they worked with, continued using innovations introduced to them or not, five (83.3%) of them agreed that all farmers they worked with continued using the innovations. Only one agent (16.7%) disagreed. The reason

given by the five extension agents why farmers continued using the innovations introduced to them, are presented in Table 25 below.

TABLE 25: REASONS FOR CONTINUOUS USE OF INNOVATIONS AS GIVEN BY THE EXTENSION AGENTS

REASONS FOR CONTINUOUS USE	Frequency	%
Profitability of Innovations/good yields	3	60.0
Saving in cost	1	20.0
Good yield and saving in costs	1	20.0
Total	5	100.0

As shown in the Table 25 above, majority (60%) of the extension agents who agreed that all the farmers they worked with continued using the innovations, stated that the farmers continued using the innovations because of the profitability/good yields which the farmers derived from the innovations. One agent gave saving in cost of production to the farmers as one of the reasons why the farmers continued using the innovations. Another agent gave saving in costs and good yields as reasons why some farmers continued using the innovations. On the other hand, the only extension agent who disagreed that not all farmers who adopted innovations continued using them said that lack of money prevented the farmers from continued usage of the innovations.

To further assess the appropriateness of the innovations, the farmers were asked to indicate innovations that they are still using which gave them much benefits. The frequency distribution of the innovations that were of benefit to the extension follower farmers is presented in Table 26 below.

TABLE 26: INNOVATIONS THAT GIVE BENEFIT TO THE EXTENSION FOLLOWER FARMERS

INNOVATIONS THAT GIVE BENEFIT	Frequency	%
Fertilizers only	3	3.1
Fertilizer and Insecticides	16	16.7
Fertilizer, Insecticides, and spraying machine	64	66.8
Fertilizer, Insecticide, spraying machine and poultry manure	4	4.2
Insecticide and spraying machine	3	3.1
Fertilizer, Insecticide, and Poultry manure	2	2.1
Crop rotation	1	1.0
Reduced Stirring	1	1.0
Zoning localities for marketing	1	1.0
Fertilizers, spraying machine and water pump	1	1.0
Total	96	100.0

As shown in Table 26 above, majority of the extension follower farmers 64 (66.8%) gave fertilizers, insecticides, and spraying machine as innovations that gave them much benefit, while 16.7% gave fertilizers and insecticides as innovations that gave them much benefit, three (3.1%) of the extension follower farmers gave fertilizers only as the innovations that gave them benefit. Other innovations like, reduced stirring of the soil, zoning localities, crop rotation and the use of water pumps also gave benefit to the extension follower farmers who still used them.

In table 27 below, the innovations of that gave much benefit to the other farmers is presented.

TABLE 27: INNOVATIONS THAT GIVE BENEFITS TO THE OTHER FARMERS

INNOVATIONS THAT GIVE BENEFIT	F	%
Fertilizers only	4	4.2
Fertilizer and Insecticides	16	16.8
Fertilizer and spraying machine	5	5.2
Fertilizer, Insecticide and spraying machine	67	69.8
Water pumps only	1	1.0
Fertilizer, Insecticide, Green manure, and spraying machine	1	1.0
Fertilizer, Insecticide, spraying machine and water pump	1	1.0
Fertilizer, Insecticide, and water pump	1	1.0
Total	96	100.0

As indicated in Table 27, majority of the other farmers (69.8%), mentioned fertilizers, inseciticides and spraying machine as innovations that gave them much benefit. While 16.8% of them mentioned fertilizers and insecticides as innovations that gave them much benefit, 5.2% mentioned fertilizer and spraying machine. Only four of them mentioned fertilizers as the only innovation that gave them much benefit. Other innovations that are of much benefit to the other farmers are the use of water pumps, green manuring, etc.

4.3 EXTENSION METHODS AND INFORMATION DELIVERY ABOUT THE INNOVATIONS

This section deals with the methods by which the innovations were introduced to the farmers from the sources indicated in section 4.2.5. The method or means by which information about the

innovations were delivered to the farmers, and the farmers ratings of the methods are also dealt with in this section.

4.3.1 Extension Methods Used in Introducing the Innovations

The methods by which the extension follower farmers learnt or were introduced to the innovations are presented in Table 28 below.

TABLE 28: THE MEANS/METHODS BY WHICH THE EXTENSION FOLLOWER FARMERS WERE INTRODUCED TO THE INNOVATIONS AS INDICATED BY THEM

THE MEANS/METHODS	Frequency	%
Lecture by farmer friends	9	9.4
Demonstration by farmer friends	27	28.0
Lecture by extension agents	9	9.4
Demonstration by Extension agents	16	16.7
Lecture by FASCOM/Sellers of Inputs	10	10.4
Lecture and Demonstration by farmer friends	4	4.2
Demonstration by farmer friends and Extension agents	5	5.2
Lecture by extension Agents and demonstration by farmer friends	8	8.3
Lecture by FASCOM and Denmonstration by farmer friends	4	4.2
Lecture and Demonstration by Extension	4	4.2
Total	96	100.0

The results as shown in Table 28 above indicates that while 28.0% of the extension follower farmers learnt or were introduced to the use of the innovations through the demonstration (watching/observation) by farmer friends, 16.7% of them learnt the use of the innovations through demonstrations by extension agents. The same number (9.4%) of the extension follower farmers also

learnt the use of the innovations through lecture by extension agents and farmer friends. Also 10.4% of them were introduced to innovations through lecture (Verbal explanation) by FASCOM/sellers of farm inputs in the area.

In Table 29 below is presented the methods/means by which the other farmers were introduced to or learnt the use of innovations.

TABLE 29: MEANS/METHODS BY WHICH THE OTHER FARMERS WERE INTRODUCED TO THE INNOVATIONS AS INDICATED BY THEM

THE MEANS/METHODS	Frequency	%
Lecture by farmer friends	15	15.6
Demonstration by farmer friends	33	34.3
Lecture and Demonstration by farmer friends	7	7.3
Demonstration of Extension agents	8	8.3
Lecture by Extension agents	6	6.3
Demonstration by farmer friends and lecture by extension agents	3	3.1
Lecture by FASCOM/sellers of inputs	12	12.5
Lecture by FASCOM and farmer friends	6	6.3
Demonstration by farmer friends and lecture by FASCOM/ sellers of inputs	6	6.3
Total	96	100.0

While 34.3% of the other farmers were introduced to innovations through demonstrations by farmer friends only 8.3% were introduced to it through demonstration by extension agents. Also 15.6% of them learnt how to use the innovations through lecture by farmer friends while only 6.3% were introduced to innovations by lecture given the by Extension agents. However 12.5% of the other farmers were introduced to innovations through lecture by FASCOM/sellers of farm inputs.

In Table 30 below is presented the frequency distribution of the different extension teaching methods used by the extension agents in introducing or teaching about innovations in the study area as indicated

by the extension agents themselves.

TABLE 30: EXTENSION METHODS USED BY THE EXTENSION AGENTS IN THE INTRODUCTION OF INNOVATIONS TO THE SHALLOT FARMERS

EXTENSION METHOD	Frequency	%
Demonstration, Lecture, and Group discussion	1	16.7
Group discussions and Visits and Demonstration	2	33.3
Rallies, Group discussions, visits, and demonstrations	2	33.3
Demonstrations only	1	16.7
Total	6	100.0

As shown in Table 30, each of the six extension agents used demonstration in teaching the farmers. However majority of the extension agents (66.6%) indicated that they used combination of group discussions, visits and demonstrations.

The extension methods most often used by the extension agents as indicated by the agents themselves are presented in Table 31 below.

TABLE 31: EXTENSION METHODS MOST OFTEN USED BY THE EXTENSION AGENTS IN WORKING WITH FARMERS

MOST OFTENLY USED EXTENSION METHOD	Frequency	%
Lecture	1	16.7
Group discussion and visits	3	50.0
Demonstrations	1	16.6
Group discussions	1	16.7
Total	6	100.0

As indicated in Table 31, above, 50% of the extension agents gave group discussions and visits as the methods they most often used to teach the farmers. The rest indicated one teaching method each which is most often used.

The extension follower farmers' rating of the methods or means by which they were introuced to the innovations or learnt them is presented in Table 32 below.

TABLE 32: PERCEPTION OF EXTENSION FOLLOWER FARMERS ON APPROPRIATNESS OF EXTENSION METHODS USED IN THE INTRODUCTION OF INNOVATIONS

EXTENSION METHODS	APPRO-PRIATE FREQUENCY	%	INAPPRO-PRIATE FREQUENCY	%
Lecture by farmer friends	6	6.3	3	3.1
Demonstration by farmer friends	27	28.0	-	
Lecture by extension agents	6	6.3	3	3.1
Demonstration by Extension agents	12	12.5	4	4.2
Lecture by FASCOM/Sellers of farm Inputs	4	4.2	6	6.3
Lecture and Demonstration by farmer friends	4	4.2	-	
Demonstration by farmers friends and Extension agents	4	4.2	1	1.0
Lecture by Extension agents and demonstration by farmer friend	7	4.2	1	1.0
Lecture by FASCOM ands demonstration by farmer friends	4	4.2	-	
Lecture and Demonstration by Extension agents	4	4.2	-	
(Inappropriate)	18	18.7		
Total	96	100.0	18.7	18.7

Table 32 shows that while six (6.3%) of the extension follower farmers felt lecture (verbal explanation) by farmer friends was appropriate three (3.1%) felt it was inappropriate. However 27 (28.0%) of the extension follower farmers felt demonstration by their farmer friends was appropriate. Also while 12 (12.5%) of the extension follower farmers felt demonstrations by extension agent was appropriate, 4.2% thought it was inappropriate. Likewise while 6.3% of the extension follower farmers felt lecture

by the extension agents was appropriate, 3.1% rated it as inappropriate. Lecture by extension agents and demonstration by farmers friends were rated appropriate by 7.3% extension follower farmers as against 1.0% who rated it inappropriate. On the whole while 81.7% of the extension follower farmers considered the various method as appropriate to them, only 18.8% considered them as inappropriate.

In Table 33 the other farmers' rating of the methods by which they were introduced to the innovations is presented.

TABLE 33: PERCEPTION OF THE OTHER FARMERS ON APPROPRIATENESS OF EXTENSION METHODS USED IN THE INTRODUCTION OF INNOVATIONS

EXTENSION METHODS	APPRO-PRIATE F	%	INAPPRO -PRIATE F	%
Lecture by farmer friends	12	12.5	3	3.1
Demonstration by farmer friends	29	30.2	4	4.2
Lecture and demonstration by farmer friends	7	7.2	-	2.1
Demonstration by extension agents	6	6.3	2	
Lecture by extension agents	6	6.3	-	
Demonstration by farmer friends and lecture by extension agents	3	3.1	-	
Lecture by FASCOM/Sellers	3	3.1	9	9.4
Lecture by FASCOM/Sellers and farmer friends	3	3.1	3	3.1
Demonstration by farmer friends and lecture by FASCOM	6	6.3	-	
(Inappropriate)	21	21.9	-	
Total	96	100.0	21	21.9

While 30.2% of them rated demonstrations by farmer friends appropriate, 4.2% rated it inappropriate. Lecture by farmers friends was rated appropriate by 12.5% as against 3.1% who rated it inappropriate. However while only 3.1% of the other farmers rated Lecture (verbal explanation) by FASCOM/sellers of farm input as appropriate as much as 9.4% rated that method inapropriate. Lecture (verbal explanation) and demonstration by farmers friends and lecture (verbal explanation) by FASCOM/sellers

farm inputs and demonstration by farmer friends were rated appropirate by all the other farmers who were introduced to innovations by these methods.

4.3.2 Methods/Means of Information acqusition by Farmers

The farmers were asked to indicate how they got or acquired information about the innovations from the sources of innovations earlier indicated. The methods or means by which the farmers got information from the sources as indicated by the farmers themselves include:

1. Discussion/Conversation with farmer friends
2. Through visits of the Extension agents
3. Farmers' visit to the Extension agents
4. Through purchasing of items from FASCOM and
5. At Farmers Meetings

The frequency distribution of the means by which the extension follower farmers got information about innovations is presented in Table 34 below.

TABLE 34: METHODS/MEANS OF INFORMATION ACQUISITION BY THE EXTENSION FOLLOWER FARMERS

METHODS/MEANS OF INFORMATION ACQUISITION	Frequency	%
Discussion with farmer friends	22	22.9
Extension Agents visit to the farmers	16	16.7
Discussion with farmer friends and Extension agents visit	19	19.7
Farmers' visit to the Extension agents	11	11.5
Discussion with farmer friends and purchase of items from FASCOM/Sellers of farm Inputs	18	18.7
At Farmers' meetings	4	4.2
Extension agents' visit and purchase of items from FASCOM/ Sellers of Inputs	6	6.3
Total	96	100.0

As indicated in Table 34 above, while 22.9% of the extension follower farmers had information about innovations through discussion or conversation with farmer friends, 16.7% relied on the visits of the extension agents to them for their information. Another 19.7% of the extension follower farmers got their information about innovations through discussions with farmer friends and visits of the extension agents. Few extension follower farmers (11.5%) visit the extension agents for information about the innovations. While 18.7% of the extension follower farmers had their information through purchasing of items from FASCOM/sellers of farm inputs and discussion with farmer friends, only 4.2% had their information about innovations at farmers' meetings. Six (6.3%) of the extension follower farmers got information about innovations through the extension agents' visits and purchase of items from FASCOM/sellers of farm inputs.

In Table 35, below the frequency distribution of the methods/means by which the other farmers got their information, is presented.

TABLE 35: THE MEANS/METHODS OF INFORMATION ACQUISITION BY THE OTHER FARMERS

METHODS/MEANS OF INFORMATION ACQUISITION	Frequency	%
Discussion with farmer friends	37	38.5
Extension Agents visit to the farmers	8	8.3
Discussion with farmer friends and visit of agent	7	7.3
Discussion with farmer friends and purchase of items from FASCOM/Sellers of Inputs	19	19.8
Purchase of items from FASCOM/Sellers of Inputs	16	16.7
At Farmers' meetings	7	7.3
Reading instructions/publications	2	2.1
Total	96	100.0

Thirty eight and half percent of the other famers got their information through discussion with farmer friends and only 8.3% had information through visits of extension agents. A good number (19.8%) of the them got their information about innovations through discussion/conversation with farmer friends and through purchase of items from FASCOM/sellers of farm inputs. Only 7.3% of the them had their information at Farmers's meetings.

4.3.3 Nature of Information Delivery about innovations from the sources

The nature of availability of information delivery on innovations from the sources as indicated by the extension follower farmers is presented in Table 36 below.

TABLE 36: NATURE OF INFORMATION FLOW ABOUT INNOVATIONS AS INDICATED BY THE EXTENSION FOLLOWER FARMERS

NATURE OF INFORMATION FLOW	Frequency	%
Readily available from farmer friends	25	26.0
Readily available from Extension agents	24	25.0
Readily available from Extension agents and FASCOM/Sellers of Farm Inputs	1	1.0
Readily available from Extension agents and farmer friends	8	8.4
Readily available from farmer friends and FASCOM	8	8.4
Not readily available from Extension agents	12	12.5
Not readily available from farmer friends	7	7.3
Not Readily available from FASCOM	3	3.1
Not Readily available from Extension agents and FASCOM	3	3.1
Not readily available from farmer friends, FASCOM and Publications	3	3.1
Not readily available from farmer friends and Extension agents	2	2.1
Total	96	100.0

As shown in Table 36 above, 26% of the extension follower farmers said information about innovations was made readily available to them from farmer friends while 25% said information about innovations was readily available to them from the extension agents.

Also the same number (8.4%) of the extension follower farmers indicated that information about the innovations was made readily available to them from extension agents and farmers friends on one hand and farmer friends and FASCOM/sellers of farm inputs on the other. While 12.5% of the extension follower farmers said information about innovations was not readily available to them from extension agents, 7.3% said it was not readily available from farmer friends . Also 3.1% of the extension follower farmers indicated that information about innovations was not readily available to them from farmer friends, FASCOM and publications.

The nature of information flow about innovations as indicated by the other farmers is presented in Table 37 below.

TABLE 37: NATURE OF INFORMATION FLOW ABOUT INNOVATIONS AS INDICATED BY THE OTHER FARMERS

NATURE OF INFORMATION FLOW	Frequency	%
Readily available from farmer friends	39	40.6
Readily available from Extension agents	3	3.1
Readily available from Extension agents and FASCOM/Sellers of Farm Inputs	1	1.0
Readily available from Extension agents and farmer friends	4	4.2
Readily available from farmer friends and FASCOM	2	2.1
Not readily available from Extension agents	12	12.5
Not Readily available from FASCOM	15	15.7
Not readily available from farmer friends	7	7.3
Not Readily available from farmer friends and extention agents	5	5.2
Not readily available from farmers friends and FASCOM/Sellers of Farm Inputs	3	3.1
Readily available from FASCOM	5	5.2
Total	96	100

As shown in Table 37 above, while 40.6% of the other farmers indicated that they readily received information about innovations from farmer friends only 3.1% said they readily received information about innovations from extension agents alone. While only one farmer said he received information readily from extension agents and FASCOM/Sellers of farm inputs, four (4.2%) said they received information readily from extension agents and farmer friends combined. On the other hand, while 7.3% of the other farmers did not readily receive information from their farmer friends, 12.5% did not readily receive information from extension agents, and 15.7% did not readily receive information from FASCOM/sellers of farm inputs.

4.3.4 Importance of Information Sources to the farmers

Table 38 presents the assessment of the sources from which the extension follow farmers received information on farming matters generally.

TABLE: 38 EXTENSION FOLLOWER FARMERS' RANKING OF THE INFORMATION SOURCES

	SOURCES OF INFORMATION							
	FARMER FRIENDS		FASCOM/Sellers of inputs		Extension Agents		Others: Books/Publications	
RANKING	frequency	%	frequency	%	frequency	%	frequency	%
IMPORTANT	84	91.3	22	56.4	52	89.6	2	100
NOT IMPORTANT	8	8.7	17	43.6	6	10.4	-	-
TOTAL	92	100	39	100	58	100	2	100.0

As shown in Table 38, above, majority of the extension follower farmers 84 (91.33%) who received information on farming matters from farmer friends indicated that source as important. Eight (18.7%) of them however said their farmer friends were not an important source of information on farming to them. About the extension agents 52 (89.6%) of the extension follower farmers who gave them as a source of information on farming matters indicated that they were an important source of information with only 10.4% of them saying they were not an important source of information.

With regard to FASCOM/sellers of farm inputs, 22 (56.4%) of the extension follower farmers who used them as a source of information on farming, said they were an important source to them while 43.6% of them said they were not important to them as a source of information.

The other farmers' ranking of sources of information on farming matters is presented in Table 39 below.

TABLE: 39 OTHER FARMERS' RANKING OF INFORMATION SOURCES

	SOURCES OF INFORMATION							
	FARMER FRIENDS		FASCOM/Sellers of inputs		Extension Agents		Others: Books/Publications	
RANKING	frequency	%	frequency	%	frequency	%	frequency	%
IMPORTANT	89	95.7	27	81..8	10	62.5	4	100
NOT IMPORTANT	4	4.3	6	18.2	6	37.5	-	-
TOTAL	93	100.0	33	100.0	16	100.0	4	100

In Table 39 above 89 (95.7%) of the other farmers who received information on farming matters from their farmer friends ranked it as important with only 4 (4.3%) saying that their friends were not an important source to them.

Twenty-seven (81.8%) of the other farmers who gave FASCOM/sellers of farm inputs as a source of information, said the source is important to them, while six 18.2%) said FASCOM/sellers of farm inputs were not important. Only 10 (62.5%) of the other farmers who gave extension agents as a source of information on farming matters said the extension agents were an important source of information to them while as much as 37.5% said the extension agents were not important to them as a source of information on farming to them.

4.4 OUTCOMES AND CHANGES BROUGHT BY THE INNOVATIONS

In this section, the outcomes that the farmers had as a result of the use of the innovations introduced to them, are presented. Also individual personal changes that the farmers have experienced and the changes occuring in the shallot farming generally in the study area as a result of the use of the innovations by the farmers are also indicated in this section. Finally, the contributions of extension activities to the improvement in the shallot farming in the study area and some problems that limit agricultural extension work in the study area are also presented.

4.4.1 Changes occurring in Shallot Farming in the Study Area

The farmers and the extension agent indicated a number of changes in shallot farming as a result of the use of the innovations. Table 40 below gives those changes that the extension follower farmers have indicated.

TABLE 40: THE CHANGES OCCURING IN THE SHALLOT FARMING AS INDICATED BY THE EXTENSION FOLLOWER FARMERS

CHANGES	Frequency	%
Increasing yield/output	41	42.7
Cultivation of more beds/expansion	14	14.6
Effective pest control	18	18.8
Saving in Time and Labour	8	8.3
Deterioration in Seed bulbs after use of chemical	9	9.4
fertilizers	1	1.0
Over dependence on chemical fertilizers	5	5.2
No change		
Total	96	100.0

As indicated in Table 40, majority of the extension follower farmers (76%) gave increasing yield, cultivation of more farm beds/expansion, and effective pest control as the main changes that have occurred in shallot farming in the study area. While only one extension follower farmer mentioned that there was over dependence on the use of chemical fertilizers, another 9.4% said there was quick deterioration (spoilage) of their seed bulbs. That is seed bulbs no longer stone for longer periods. They tend to spoil during storage. This according to the farmers could be attributed to the effect of the chemical fertilizers they use which make the bulbs to grow bigger. Also while 5.2% of the extension follower farmers have indicated that there was no change, 8.3% said there was saving in time and labour on certain farming operations, like use of spraying machines.

In Table 41 below, the frequency distribution of the changes occurring in shallot farming as indicated by the other farmers, is presented.

TABLE 41: THE CHANGES OCCURING IN THE SHALLOT FARMING AS INDICATED BY OTHER FARMERS

THE CHANGES	Frquency	%
Increasing yield/output	43	44.8
Cultivation of more beds/expansion	16	16.7
Effective pest control	13	13.5
Deterioration on seed bulbs	4	4.2
Saving in Time and Labour	15	15.6
Overdependence on chemical fertilizers	2	2.1
No change	3	3.1
Total	96	100.0

Table 41 above shows that majority (75%) of the other farmers also indicated increasing yield/output, cultivation of more farm beds and effective pest control as the main changes that have occurred in shallot farming. While three (3.1%) other farmers indicated that there was no change, two (21.1%) mentioned over dependence on the use of chemical fertilizers as a change in shallot farming in the study area. However, 15.6% of the other farmers said the use of the innovations brought saving in time and labour in farming activities generally in the study area.

In Table 42 below changes that occurred in shallot farming in the study area which the extension agents indicated, are presented.

TABLE 42: CHANGES OCCURING IN SHALLOT FARMING AS INDICATED BY EXTENSION AGENTS

THE CHANGES	Frequency	%
Effective Pest Control	2	33.3
Increased production and Willingness to use other innovations	2	33.3
Longer storage of seed bulbs	1	16.7
Reduced Wastage of chemicals	1	16.7
Total	6	100.0

As shown in Table 42 above, a third of the extension agents (33.3%) gave increased yield as changes occuring in shallot farming as a result of the introduction and use of innovations such as fertilizers. Another third also gave effective pest control as a change brought by the introduction and use of innovations like insecticides. Only one extension agent each mentioned longer storage of seed bulbs and reduced wastage of chemicals (insecticides) from the use of spraying machines as changes they have observed.

4.4.2 **Personal Changes to Respondent farmers**

Personal changes that the use of the innovations have brought to the extension follower farmers as indicated by the farmers themselves are presented in Table 43 below.

TABLE 43: PERSONAL CHANGES INDICATED BY THE EXTENSION FOLLOWER FARMERS

CHANGES EXPERIENCED	Frequency	%
More Income from Increased ouput	33	34.4
Ability to meet social family obligations	24	25.0
Acquisition of Personal property	31	32.3
No change	6	6.3
Winning awards	2	2.0
Total	96	100.0

About one third (34.4%) of the extension follower farmers gave more income from increased yield as a change they had personally from the use of the innovations. Ability to meet social and family obligations was given by 25% of the extension follower farmers as change to them personally from the

use of the innovations. Another 32.3% extension follower farmers said they were able to acquire some personal property as a result of the use of innovations. While 6.3% of the extension follower farmers said they had no change from the use of the innovations, two of the farmers said they were able to win Farmers' awards as a result of the use of innovations in their farming.

The personal changes experienced by the other farmers are presented in Table 44 below. As indicated in Table 44 below whilst 26.1% of the other farmers gave more income from increased output, 40.6% gave the ability to meet social and family obligations as personal changes they had from the use of innovations. Acquisition of personal property was given by 19.8% of the other farmers as a change they had from the use of the innovations. Whilst 10.4% of the other farmers said they had no personal change from the use of innovations, 3.1% said they rather had decreasing output.

TABLE 44: PERSONAL CHANGES INDICATED BY THE OTHER FARMERS

CHANGES EXPERIENCED	Frequency	%
More Income from Increased ouput	25	26.1
Ability to meet social family obligations	39	40.6
Acquisition of Personal property	19	19.8
Decreasing output	3	3.1
No change	10	10.4
Total	96	100.0

4.4.3 Changes attributed to Extension activities

The respondent farmers were asked to indicate those changes occurring in the shallot farming in the study area that could be attributed to extension activities. The frequency distribution of the

changes, the extension follower farmers attributed to extension activities is presented in Table 45 below.

TABLE 45: THE CHANGES THE EXTENSION FOLLOWER FARMERS ATTRIBUTED TO EXTENSION ACTIVITIES

CHANGES ATTRIBUTED TO EXTENSION	F	%
Increasing yield/Output	30	33.0
Effective pest control	14	15.4
Saving in Time and Labour	5	5.5
Cultivation of more beds/expansion	9	9.9
Over dependence on chemical fertilizers	1	1.1
Longer storage of seed bulbs	1	1.1
None of the changes	31	34.0
Total	91	100.0

The distribution shows that of the 91 extension follower farmers who indicated that some changes have occurred in shallot farming in the study area, 60 (65.9%) attributed the changes to extension activities while 31 (34.0%) of them did not attribute any of the changes to extension activities. Table 45 further shows that while 33% of extension follower farmers attributed increasing yield to extension activities, 15.4% attributed effective pest control to extension activities. Also saving in time and labour according to 5.5% of the extension follower farmers could be attributed to extension activities. Cultivation of more shallot beds/expansion in farming activities in the area, was attributed to extension activities by only 9.9% extension follwer farmers.

On the part of the other farmers, of the 93 (96.9%) who indicated that changes have occurred in shallot farming, twenty (21.5%) of them attributed the changes occurring in shallot farming to extension activities while 73 (78.5%) attributed none of the changes to extension activities. The frequency distribution of the changes which the other farmers attributed to extension activities is presented in Table 46 below.

TABLE 46: THE CHANGES THE OTHER FARMERS ATTRIBUTED TO EXTENSION ACTIVITIES

CHANGES ATTRIBUTED TO EXTENSION ACTIVITIES	Frequency	%
Increasing yield/Output	11	11.8
Effective pest control	4	4.3
Saving in Time and Labour	3	3.2
Cultivation of more beds/expansion	2	2.2
None of the changes	73	78.5
Total	93	100.0

As indicated in Table 46 above, 11.8% of the other farmers attributed increasing yield to extension activities while only 4.3% of them attributed effective pest control to extension activities in the area. Saving in time and labour, was attributed to extension activities by only 3.2% of other farmers while 2.2% of the other farmers attributed the cultivation of more farm beds to extension activities.

4.4.4 Contributions of Extension Activities to Improvement in Shallot Farming in the Study Area

In table 47 below is presented the frequency distribution of the farmers' responses as to whether extension activities contributed to improvement in shallot farming or not in the study area.

TABLE 47: CONTRIBUTION OF EXTENSION ACTIVITIES TO IMPROVEMENT IN SHALLOT FARMING AS INDICATED BY THE SHALLOT FARMERS

CONTRIBUTIONS TO IMPROVEMENT(EXTENSION FOLLOWER FARMERS)	F	%
YES	67	69.8
NO	29	30.2
TOTAL	96	100.0
CONTRIBUTION OF EXTENSION ACTIVITIES TO IMPROVEMENT IN SHALLOT FARMING (OTHER FARMERS)		
CONTRIBUTION TO IMPROVEMENT	F	%
YES	26	27.1
N0	70	72.9
TOTAL	96	100.0

As shown in table 47 above 69.8% of the extension follower farmers agreed that extension activities have contributed to improvement in shallot farming while 30.2% disagreed. On the other hand, while 27.1% of the other farmers agreed that extension activities have contributed to improvement in shallot farming as much as 72.9% said activities of the extension agents have not contributed to any improvement in shallot farming.

Table 48 below gives the frequency distribution of the reasons given by those extension follower farmers who agreed that extension activities have contributed to improvement in shallot farming.

TABLE 48: REASONS GIVEN BY EXTENSION FOLLOWER FARMERS WHY EXTENSION ACTIVITES CONTRIBUTED TO IMPROVEMENT IN SHALLOT FARMING

REASON WHY EXTENSION ACTIVITIES CONTRIBUTED TO IMPROVEMENT	Frequency	%
They introduced innovations	5	7.4
They taught correct use of fertilizers and Insecticides	33	49.3
Activities brought expansion in farming	29	43.3
Total	67	100.0

As indicated in Table 48, only 7.4% of the extension follower farmers who agreed that extension activities contributed to improvement in shallot farming, said it was because of the innovations that the extension agents had introduced. Another 49.3% extension follower farmers said extension activities contributed to improvement in shallot farming because the agents taught correct use of fertilizers and

other agrochemicals. According to another 43.3% extension follower farmers who agreed, the activities of the extension agents resulted in expansion in shallot farming generally in the study area.

The frequency distribution of the reason given by the twenty six other farmers why extension activities have contributed to improvement in shallot farming is presented in Table 49 below.

TABLE 49: REASONS GIVEN BY THE OTHER FARMERS WHY EXTENSION ACTIVITIES HAVE CONTRIBUTED TO IMPROVEMENT IN SHALLOT FARMING

REASON WHY EXTENSION ACTIVITIES HAVE CONTRIBUTED TO IMPROVEMENT	Frequency	%
They introduced innovations	9	34.6
Taught correct use of fertilizers and pesticides	14	53.9
Activities brought expansion in farming	3	11.5
Total	26	100.0

As shown in Table 49 above, 53.9% of the other farmers who agreed that extension activities have contributed to improvement, said the extension agents taught the correct use of fertilizes and insecticides while 34.6% said the extension agents introduced innovations. On the other hand only three (11.5%) of the other farmers who agreed, said that the activities of the agents brought expansion in farming activities in the study area.

The farmers who disagreed that extension activities contributed to any improvement in shallot farming also gave reasons for their disagreement. And in Table 50 below those reasons given by the extension follower farmers who disagreed, are presented.

TABLE 50: REASONS WHY EXTENSION ACTIVITIES HAVE NOT CONTRIBUTED TO IMPROVEMENT IN SHALLOT FARMING AS INDICATED BY EXTENSION FOLLOWER FARMERS

REASONS FOR NON CONTRIBUTION	Frequency	%
They did not visit farmers	11	38.0
Did not teach farmers anything	13	44.8
Did not help farmers with loans/advice	5	17.2
Total	29	100.0

As indicated in Table 50 above 44.8% of those extension follower farmers who disagreed, said that the extension agents did not teach them anything, while 38.0% of those who disagreed said the agents did not visit farmers. Five (17.2%) of the extension follower farmers who disagreed said that the extension agents did not help farmers with loans.

In Table 51 below is presented the frequency distribution of the reasons given by those other farmers who disagreed that extension activities have contributed to improvement in shallot farming

TABLE 51: REASONS WHY EXTENSION ACTIVITIES HAVE NOT CONTRIBUTED TO IMPROVEMENT IN SHALLOT FARMING AS INDICATED BY OTHER FARMERS

REASONS FOR NON CONTRIBUTION	Frequency	%
They did not visit farmers	50	71.4
Did not teach farmers anything	13	18.6
Did not help farmers with loans/advice	6	8.6
Improvement depends on weather	1	1.4
Total	70	100.0

As shown in Table 51 above, 71.4% of those other farmers who disagreed that extension activities contributed to improvement in shallot farming said the extension agents did not visit farmers, while 18.6% of them said that the extension agents did not teach farmers anything. Six (8.6%) of those other farmers who disagreed, said that the extension agents did not help farmers with loans.

4.4.5 Problems Limiting Extension Work in the Study Area

The extension agents were asked to indicate the problems that militate against their extension work in the study area. The frequency distribution of the problems as given by the extension agents are presented in Table 52 below.

TABLE 52: PROBLEMS LIMITING EXTENSION WORK AS INDICATED BY EXTENSION AGENTS

PROBLEMS LIMITING EXTENSION WORK	Frequency	%
Unavailability of materials for demonstration	1	16.7
Scattered nature of individual farm holdings	1	16.7
Access to other sources of Farm Inputs and Conservatism of farmers	1	16.7
Lack of production recommendations	2	33.2
Understaffing	1	16.7
Total	6	100.0

As indicate in Table 52 above, a third of the extension agents gave lack of recommendation on production practices as one of the problems that hamper their work in the study area. One extension agent each gave,

1. Lack of materials for demonstrations
2. Difficulty in contacting farmers due to the scattered nature of individual farm holdings of farmers.
3. Farmers' access to other sources of inputs and high farmer-agent ratio (Understaffing) as the other problems that militate against their work in the study area.

CHAPTER FIVE

5.0 DISCUSSION OF RESULTS

The findings of this study are discussed under the following headings:

1. Description of the respondent farmers
2. Innovations introduced
3. Extension methods and information delivery about innovations and
4. Outcomes or changes brought by the innovations.

5.1 DESCRIPTION OF RESPONDENT FARMERS

5.1.1 Age of respondents

In all one hundred and ninety-two (192) shallot farmers were interviewed. This was made up of ninety-six (96) follower farmers and ninety-six (96) other farmers. The extension follower farmers were those shallot farmers who belonged to the farmer's groups in the study area with which the extension agents were supposed to work with while the other farmers were those farmers who did not belong to any of the extension groups. The extension follower farmers were made up of 87 men and nine (9) women; while the other farmers were made up of eighty-six (86) men and ten (10) women.

The ages of the extension follower farmers ranged between 26 and 57 years. The ages of the other farmers ranged between 18 and 57 years. The age ranges as revealed by the results show that the sample chosen for the study include good number of both middle aged and elderly farmers. The

literature surveyed suggests that age as a factor in the adoption behaviour of farmers is debatable (Lionberger 1960; and (Rogers 1962).

5.1.2 Level of Education of Respondents

Except for twenty-nine extension follower farmers and twenty-five other farmers, the rest of the respondents have had some formal education. This presupposes that most of the respondents are literate and therefore should be well disposed to the adoption of innovations, as the level of education has been found to influence the rate of adoption (Lionberger, 1960). According to Feaster (1968), `rates of change' in this case adoption of new ideas, differ among individuals because of the in herent or acquired differencies like age and educational levels of the indivuduals. That is people with higher educational levels are more likely to adopt new ideas which will bring change in them.

5.1.3 Number of Farm Beds Cultivated

The results show that over 60% of sampled farmers cultivated more than 50 beds per season. This finding suggests that most of the respondent farmers operate on fairly large scale and as such would not be reluctant to adopt innovations or shy away from them. As noted by Bose, (1961), in addition to education, contact with extension is another important factor that influences the adoption of farm practices. That is farmers with larger farms tend to adopt new farm practices more readily than farmers with small sizes.

5.1.4 Ownership Right over the Bed Cultivated/influence

The results show that the sampled farmers cultivated farm beds which they owned both through inheritance from parents, by mortgage, by renting from other farmers, and in few cases by share cropping. A finding in the study as regards the ownership of farm beds is that almost all the farmers stated that they freely used whatever innovation they wanted to use on the farm beds irrespective of ownership title or right they had over the beds. In other words the ownership right did not influence them in any way in the adoption of innovations. This therefore implies that ownership right or title over the beds (land tenure) is not a barrier to the adoption and use of innovations in the study area. This may be so, because the main crop which is shallot is not a permanent crop or a tree crop. The maturity period of the crop is also so short i.e. eight weeks, that ownership or tenure of the land (farm beds) could change quite easily and frequently.

In the shallot farming in Anloga, farmers cultivating beds on mortgage, sharecropping, and on lease or rental basis are not regarded strictly as tenants working for a `land lord'. He operates such farm beds on owner-operator basis as long as the mortgage, sharecropping or lease agreement lasts. As such he exercises full control over the beds during the farming season just like an actual owner would do. Thus this findings agrees with the observation of Lionberger (1960) that owner operators have more complete control over their operations and thus could make decisions to adopt and use new practices.

5.1.5 Additional Occupation

Except for thirty-five extension follower farmers and thirty-four other farmers the rest of the respondent farmers stated that they did not do any other income earning work in addition to the shallot farming. This suggests that most of the respondents farmers are full time farmers. Those few respondent farmers who had some additional occupation stated that the additional occupation gave them extra income which nevertheless helped them in the acquisition and use of the innovations. Jones, (1963) indicated that the income of the adopter in addition his farm size, age and educational level should be considered as the factors that influence the adoption of farming innovations. Thus farmers with other sources income would be in a better position to adopt innovations.

5.2. INNOVATIONS

5.2.1 Meaning of Innovations

The results clearly show that the farmers and the extension agents have the same or common understanding or meaning of innovations. That is innovations are new methods, techniques and materials which farmers were not using before in their farming activities. This is in agreement with the general definition of innovation in the literature that farm innovations are new or novel ideas, methods, practices, or techniques perceived by the individual as new and which provide means of achieving sustained increases in farm productivity. And that these new ideas, and practices are regarded as innovations in so far as they are modified in form or have new functions or are of wider or more restricted applicability compared with their forerunners (Adams, 1982, Presser, 1969 and Rogers, 1962).

5.2.2 Types of Innovations Introduced

The use of chemical fertilizers, insecticides, use of Knapsack sprayers and the use of water pumps for upland cultivation of shallots are innovations mentioned by majority of the respondent farmers as innovations introduced to them. Because of the intensive cultivation characteristic of shallot farming in the Anloga area, the farmers often run into soil fertility, pest and `land' scarcity problems. As such the shallot farmers would naturally be more inclined to adopt innovations that are directed at solving such problems.

The results however show that innovations such as fungicides, onion cultivation, seed bulb treatment, zoning of localities for marketing, use of poultry manure and reduced stirring of the soil were mentioned by relatively few respondents. This seems to suggest that most of the respondents are not familiar with these innovations or that they are not well exposed to them as yet. The results reveal that there doesn't seem to be much difference between innovations introduced to extension follower famers and those introduced to the other farmers. Since both the extension follower farmers and other farmers have been introduced to the same type of innovations, it follows therefore that whatever change or benefit that might come with such innovations would be enjoyed by all of them if they adopt and use them.

The extension agents on their part listed innovations which they introduced to the shallot farmers during and after VORADEP. During the VORADEP period the innovations that the extension agents introduced were:

1. Use of chemical fertilizers
2. Use of farm chemicals, i.e. Insecticides
3. Green manuring

4. Composting
5. Use of knapsack spraying machine
6. Seed bulb treatment
7. Water and soil conservation

After the VORADEP period, the innovations that the extension agents introduced were

1. Use of fungicides
2. Line/row planting
3. Use of chemicals (insecticides) other than DDT
4. Use of herbicides
5. Electrodyne sprayers
6. Use of quarantine clearance
7. Mechanical irrigation.

The main extension recommendation under the VORADEP as given by the National Agricultural Extension Project (NAEP, 1992), were use of improved varieties of seeds, (cereals) line/row planting, proper plant population, use of fertilizers and pesticides, chemical weed control, improved harvesting and storage and proper preservation and processing of food. However as revealed in this study among the extension recommendations of the project period it is only the use of fertilizers and pesticides that the respondent farmers have stated as having been introduced to them albeit from other sources and from Extension. During the project period, extension activities in the region were to be focused mainly on cereals and legumes (maize, sorghum, millet, groundnut and cowpeas). Since the extension recommendations were all limited to cereals and legumes, other non traditional food crops including vegetables like shallots were not covered sufficiently by the extension activities. Some of the

extension recommendations of the project period were however listed by the agents as having been introduced by them in the study area only after the project. However some of these recommendations (innovations) like line planting, use of herbicides, mulching, and composting were not listed by the respondent farmers as having been introduced to them. This may imply that such innovations were not adopted by the respondent farmers. Farmers are rational as such would not embrace any new agricultural technique unless such a technique truly serves their immediate or peculiars needs such as increased yields. That might account for the reason why the shallot farmers did not adopt the use of herbicides, composting, and line planting, which the extension staff introduced to them.

The results show that some of the extension agents introduced more innovations in their subdistricts than other extension agents. And that the agents seem to be promoting different innovations at the same time. For instance during the VORADEP period two of the six agents introduced the use of chemical fertilizers, agrochemicals, spraying machine and seed bulb treatment to farmers in their subdistricts. Another two however introduced green manuring, conposting, agrochemicals, and spraying machine while one agent introduced spraying machine only.

Also, after the VORADEP period, while two of the agents introduced fungicides only, another two agents introduced fertilizers, line planting of shallot and advised farmers on the use of chemicals eg. insecticides. One agent however introduced only line planting of shallot while another agent alone introduced fungicides, herbicides, mechanical irrigation, quarantine clearance and spraying machine. This seems to suggest that there is no coordinated programme or plan of activities for the agents to follow among the shallot farmers at the district level. This situation might result in some areas in the study area, lagging behind in adopting certain innovations.

5.2.3 Aspects of shallot farming into which innovations have been introduced

The main innovations introduced into the shallot farming in Anloga over the last fifteen years as given by the respondents could be categorized as

1. Chemical fertilizers
2. Agrochemicals (Pesticides and Fungicides)
3. Simple machines such as Knapsack sprayers and water pumps for upland cultivation of shallot.

The aspects of shallot farming into which they were introduced are thus obvious i.e. soil management, pest control, irrigation and land use. This clearly shows that other aspects of shallot farming such as cultural practices, new varieties, marketing were not adequately covered or catered for by the innovations introduced. Though the extension agents stated that they have introduced innovations such as green manuring, quarantine clearance, composting, mulching, seed bulb treatment, and line planting; the respondent farmers did not mention such innovations. The implication is that the farmers are not well exposed to such innovations and as such are not using new 'external inputs' by way of innovations or new technology which would help improve these aspects of the shallot farming like cultural practices and mode of planting. Thus the farmers still rely on their own ingenuity and skill to solve problems associated with these aspects such as mode of planting, introduction of new seed stock etc. No doubt the farmers still stick to the haphazard way of planting shallot and do not get quarantine clearance to easily introduce `new' seed bulbs from Agou in the Republic of Togo but still rely on traders from Agou who sell such `new` seed stocks to them at exorbitant prices.

5.2.4. Advice Farmers received from Extension

As would be expected, majority of the extension follower farmers indicated that they have had contact with extension and the majority of the other respondent farmer stated they did not have any contact with extension. A closer look at this results however reveals that on the whole a little over half (57.3%) of all the sampled farmers indicated that they have had contact with extension. This gives an indication that extension contact is quite fairly good. However when the farmers were further asked to indicate whether they received any advice on improving their shallot farming from the extension agents, a total of 150 (78.1%) of the sampled farmers (both extension follower and the other farmers) stated that they did not receive any advice on improving their shallot farming from the extension agents The high percentage of the respondent farmers who stated that they did not receive any advice from extension on improving their shallot farming, suggests that the content of the extension programmes of the agents in the study area may also be new to the farmers. This may however stem from the observation that the extension agents did not have the requisite or relevant extension recommendations on shallot farming to introduce to the farmers . This finding thus seems to support the observation of Feaster (1968) that though innovations in the agricultural sector are fundamental to agricultural and economic development, the inability to accept and use them, may be attributable to one or more of the following:

1. technically superior farm practices for LOCAL CONDITIONS (emphasis mine) do not exist
2. Where superior practices exist, they are not being communicated to the individual farmers

The results show that the few respondents who received some kind of advice from the extension agents, were not advised on recommendations specific to shallot cultivation but on the general use of fertilizers and farm chemicals and group formation. This may be due to the fact that the agents have production recommendations only on these items (fertilizers and farm chemicals). Though not specific to shallot, they conveniently extended them to the farmers. This also supports the assertion of Berlo (1960) that the knowledge a source has about the subject matter, affects the messages transmitted. For one could not communicate what one did not know and one could not communicate material that one did not understand. This may even account for the reason why the other aspects of shallot cultivation earlier mentioned were not adequately covered by the extension agents in their work. Bortei Doku (1985) also highlighted this problem of 'what to extend' by the extension agents and opined that so long as this problem persists, extension work generally in Ghana would not move forward and farmers' productivity would suffer.

5.2.5 **Sources of Innovations and Information on farm matters**

The main sources from which innovations diffused or are extended to the respondent farmers as revealed by this study are farmer friends and relatives, Extension agents, sellers of farm inputs including FASCOM, Non-governmental organizations including World Vision International (WVI) and from books or publications. Except for insecticides, more of the other farmers were introduced to the other three main innovations fertilizers, spraying machines and the use of water pumps by their farmer friends than by extension agents. This does not rule out the possibility of these farmers being introduced to these innovations by farmer friends who have been introduced to them by extension and there by demonstrating the 'trickle down' effect of extension. But this finding also

seems to suggest that the first and an important line of farmers' contact with most of the innovations is their farmer friends. Non-governmental organizations (NGOs) were not so much involved in agricultural extension activities in the study area as only one respondent stated that he learnt about the use of water pumps for irrigation from the WVI. Also mass media source including publications were not so much involved or used in the diffusion of innovations in the study area though about 70% of the respondent have had some formal education. This may be due to the dearth of published materials on the cultivation of shallot through which improved practices or technologies on shallot cultivation could be transmitted to the farmers.

The same trend shown in the data on sources of innovations to the farmers is again shown by the data on the sources of information on farm matters to the respondent farmers. The results again show that most of the respondents did not get information on farm matters from books and radio (mass media sources). On the other hand the study clearly shows that farmer friends and relatives were very prominent in the dissemination of information among the respondent farmers, as the majority of both extension follower farmers and other farmers gave farmer friends as one of the sources from which they received information on farm matters. The study also shows that most (67.7%) of the extension follower farmers received information on farming matters as would be expected from extension sources but in addition to other sources like farmer friends and sellers of farm inputs. However more of the other farmers received information on farm matters from sellers of farm inputs. This seems to suggest that the extension agents are not directly reaching out to many other farmers as would be expected. Since extension coverage seems to be concentrated more on the extension follower farmers, the other farmers who did not belong to the extension contact groups tended to turn to other sources including sellers of farm inputs for more information on their farming. This finding in respect to the sellers of

farm input is in contrast to the observation of Wilkening (1956) that sellers of farm inputs play less important roles in the early stages of adoption i.e. in first informing target groups about changes than in decision making and putting changes into actual operation.

The study thus clearly shows that there is good and effective interpersonal communication among the respondent farmers as regards the diffusion of innovations and information on farm matters. This finding that farmer friends serve as a source of information on farm matters to most of the respondent farmers in the study area, supports the finding of Wilkening et al. (1962) that farmers friends are an important source of information particularly at the point when individuals decide whether to adopt a new practice or not and that farmer's neighbours are the store of knowledge about new methods as well as the traditional methods of farming. On the other hand, farmers who do not have access to Ministry of Agriculture officials or farmers organizations but have aspirations for improvement, naturally identify themselves with other farmers who seem to be doing better than them.

Two other factors worth noting which may be responsible for the good interpersonal communication or flow of information among the shallot farmers are the nearness of the shallot farmbeds to each other and the observance of the `close of season' regulation by shallot farmers farming in a particular location in the study area. The nearness of the farm beds to each other, makes it possible for the farmers who have farms in one location, to be in very close contact or touch with one another. The shallot farm beds could be as near as 60cm from each other). Thus a farmer cannot just avoid seeing or hearing what his neighbours do or discuss on the farm when they are all there. This situation is further facilitated by the observance of the `close of season' regulation (a bye law imposed by the chief farmer which restricts the start and close of the planting seasons for different locations to specific periods in the year). The close of season regulation as practiced by the shallot farmers in the

Anloga area is culturally aimed at limiting or controlling the incidence of thripps, a serious insect pest of shallot in the area (Kemevor, 1994).

This arrangement also makes it possible for the farmers to take advantage of periods when environmental conditions are most suitable for the production of the crop in the different localities. For instance, most shallot crops that are sown early in the season most invariably yield better than the shallot crops sown late in the season as there is always a build up of the pest, thripps.

With this arrangement, the shallot farmers in the Anloga area are together in the farm at certain times to perform certain operations, though individually. By these arrangements the shallot farmers are more or less forced by circumstances to be together on the farm and thus see what a neighbour does on the farm and as such could easily and readily discuss issues with one another and even to learn certain practices from each other.

5.2.6 **Appropriateness of Innovations**

Though new technologies or improved practices abound for farmers to use, such technologies or improved practices must yield solutions to peculiar problems or better still be appropriate. To determine the appropriateness or otherwise of the innovations introduced to the respondent shallot farmers, a number of criteria were used in this study.

These are:

1. Comparing innovations used before with those still being used by the respondent farmers.
2. Respondents ratings of the innovations
3. Reasons for stopping usage of innovations by farmers.

By comparing the innovations which the respondents have used before with those that they are still using, it is clear that very few respondents both extension follower farmers and other farmers have stopped using some of the innovations.

However the study shows that more other farmers stopped using innovations as compared to extension follower farmers i.e. three extension follower farmers to ten other farmers stopped using wanng innovations. From the reasons given by the farmers who stopped using some of the innovations it is evident that high cost (difficulty) in maintenance of spraying machines and water pumps, damage to crops by poultry manure, non availability of insecticides and deterioration of seed bulbs due to fertilizers, were the reasons given for stopping such innovations. However reasons such as non availability and high cost (difficulty) in maintenance and use of innovations which were given by farmers who stopped using the innovations, might not necessarily be due to the inappropriateness of such innovations but might be due to institutional and structural constraints that hamper the acceptance and continued use of innovations (Feaster ,1968).

According to all the extension agents interviewed, not all farmers with whom they worked, adopted the innovations which they (extension agents) introduced to them. This finding is in agreement with the observation of Van de den Ban (1957) that when improved practices are developed by research stations or farmer innovators, such innovations are not immediately adopted by all farmers. The inability of all farmers to adopt innovations introduced to them according to the extension agents in the study was not due to the inappropriateness of such innovations but to what could be regarded as individual personal characteristics of the farmers. For the majority of the extension agents gave conservatism of the farmers and lack of money on the part of farmers as the reasons militating against the adoption of the innovations by all the farmers. This finding thus agrees with that of Hoffer and

Strangland (1958) that a farmer who tended to be conservative and who valued security highly would postpone the adoption of a practice or possibly never adopt it. Also, according to Doyle (1974), the conservative farmer is known to be reluctant to adopt a new facility until its characteristics have been freely determined.

The extension agents also stated that the farmers who adopted and continued using the innovations introduced to them, did so because they realised the profitability and savings in costs and other benefits in the use of the innovations. This is in agreement with the observation of Fliegel and Kivlin (1962) that innovations which permit saving in working time and costs tended to be adopted rapidly.

The majority of the respondent farmers gave chemical fertilizers, pesticides, knapsack sprayers, the use of water pumps for upland cultivation of shallot, and poultry manure as the innovation that gave them much benefit. The other respondents who gave zoning of localities for marketing, reduced stirring of the soil, onion cultivation and the use of fungicides as innovations, also stated that these also gave them much benefits. This finding gives the indication that the innovations are appropriate to the respondent farmers. This findings support the observation of Jones and Rolls (1982) that though the means of increasing agricultural production needs the availability of the technology necessary to produce and market the output, the acceptance of such innovations requires that the intended beneficiaries become convinced of their feasibility and advantage; and accept and use them in ways which are beneficial to them. Also, profitability, utility of leisure, value of additional earnings are factors that, according to Doyle (1974) influence the uptake of proposed innovations.

Finally the respondent farmers' rating of the innovations introduced to them show that some of the innovations introduced to them were appropriate while some were not appropriate to some

farmers because the results show that majority of the respondents, both extension follower and other farmers stated that all the innovations they were using were appropriate. Relatively very few respondent farmers of up to only 2.1% of extension follower and other farmers rated innovations like fertilizers, spraying machine and insecticides as being inappropriate.

5.3 EXTENSION METHODS AND INFORMATION DELIVERY

5.3.1 Extension Methods

For farmers to learn how to use innovations, the relevant learning experiences must be provided to them. Such learning experiences must however be selected so as to appeal to as many of the physical senses of the potential learners as possible. The findings clearly show that majority of both the extension follower and other farmers farmers learnt how to use the innovations through lecture (verbal explanation) by farmer friends and demonstration (watching or observing the examples) by friends. The findings further revealed that more extension follower farmers (38.5%) learnt how to use the innovations through lecture and demonstration by farmer friends than through lecture and demonstration by extension agents. This situation may be brought about by the close contact between the farmers while they work on their farm beds as reported earlier.

An interesting situation revealed by the findings however is that while all the extension agents stated that they used demonstrations to teach their farmers, only about a quarter of the extension follower farmers and only about 10% of the other farmers gave demonstrations of the extension agent as one of the methods by which they learnt the use of the innovations. Furthermore, while most of the extension agents gave visits and farmers' meetings as their most frequently used methods in reaching

out to the farmers, only one extension agent gave demonstrations as one of his most frequently used method in reaching the farmers. This seems to suggest strongly that the sampled farmers neither learnt much from the extension agents' demonstrations nor actually partook in them. Rather the agents mainly visited the farmers. This situation would not augur well for organised extension in the study area. For extension is generally regarded as an educational process which involves teaching activities. These teaching activities, according to Mosher (1966) must blend farm and home visits, demonstrations, tours, meetings, exhibitions, lectures, rallies, discussions etc, which are the real contact points between the learner farmers and all those who are involved in extension work; and that the success of all extension activities depend to large extent on the quality and effectiveness of such teaching activities.

The findings on the extension methods further show that most of the sampled farmers rated lecture by farmers friends and relatives and demonstration by farmer friends as appropriate to them than they did for lecture by extension agents and demonstrations by the extension agents. This seems to suggest a higher preference for the farmer friends' lecture and `demonstrations' among the sampled farmers. From the back drop that the shallot farmers in the Anloga area are in close contact with the farmer friends and relatives, who possess the traditional knowledge of shallot cultivation more than the extension agents, the tendency would be for the farmers to learn from and teach other farmers readily. This finding therefore gives support to the observation of Wilkening (1956) that learning the techniques of putting new practices into operation is a task oriented function which must be performed by those sources having the technical know how and interact effectively in a two-way communication and use personal demonstrations with actual materials and equipment.

5.3.2 Information delivery/acquisition

The results show that majority of the sampled farmers (both extension follower and the other farmers), through discussions and conversations with the farmer friends got information about the innovations in the study area. Also the extension agents visited most of the extension follower farmers to inform them about innovations with only very few of the sampled farmers visiting the agents for information. This finding again shows that interpersonal communication among the farmers themselves is quite high and good in the study area. This also gives the indication that the sampled farmers are equally ready to learn from and share ideas with one another. This is a healthy sign for the extension agents to capitalize on to encourage group activities which is the basis of the Training and Visit (T&V) extension programme they are supposed to be practicing. However group work or method as means of reaching out to more farmers at a time by the extension agents was not vigorously pursued in the study area. Either most respondent farmers did not attend the group meetings or that the groups were not properly organised and oriented for extension purposes.

The results also show that a good number of the respondent farmers got information about the innovations through the purchase of items (farm inputs) from those who sell farm inputs. Though pieces of information on farm innovations from commercial sources according to Albrecht et al (1989), may be more oriented to the promotion of a particular products and may be more of advertisement than of extension, they are all the same useful in making target farmers at least aware of such inputs and putting them into practice. Thus it is obvious that the sellers of farm inputs in the study area were important in informing the farmers about the new farming inputs. This finding supports the observation of Wilkening (1956) that though the influence of commercial source in technological change in

agriculture is limited to those innovations which require the use of materials or equipment, they also perform major role in providing helpful information in the action stage.

The results also clearly show that most of the respondent farmers did not use mass communication means to acquire information about the innovations in the study area. This seems to suggest that information on farming matters in the study area is not usually transmitted via mass communication means or that the farmers themselves have not as yet developed the culture of listening to or using mass communication means to get information on farming matters. As such any information on improved practices which would be passed via mass media sources could be lost to most of the farmers or it could not reach them. The findings reveal that while majority of the sampled farmers, both extension follower and other farmers, said information about the innovations was readily made available to them from farmer friends, only about 25% of the extension follower farmers said that information about innovations was readily available to them from the extension agents. The implication here is that information about innovations was not generally readily available to most of the farmers from the extension sources. This may be due to the low extension agent - farmer ratio. For instance there are only four frontline extension agents in addition to the two senior extension officers who work with about 5,000 farm families in the district.

No doubt majority of the respondent farmers rated farmer friends as being more important than extension agents and sellers of farm inputs, as sources of information on farm matters. This goes to support earlier findings in this study that there is good interpersonal communication among the respondent farmers, a situation which would be conducive for effective diffusion and dissemination of ideas among the farmers.

The findings also show that information about innovations was not readily made available to most farmers from sellers of agricultural inputs. Since information did not readily flow from the extension agents to most of the farmers, there would be a communication gap between extension agents and the farmers they are supposed to work with. This would not augur well for extension work in the study area. For one of the primary functions of extension agents is to serve as a reliable source of information for farmers. And it is through the extension agents that the extension service transmits agricultural technology and information to farmers (Akinbode, 1970). It is in this regard that extension workers are viewed globally as the `bridge' between farmers and research institutions which generate the technologies to be transmitted to the farmers. The basic objective of extension teaching would therefore not be accomplished or realised, if this `bridge' would be defective or non functional i.e. if vital information on improved farm practices could not readily and continuously flow via this `bridge' to farmers as revealed in this study.

5.4 CHANGES AND OUTCOMES BROUGHT BY THE INNOVATIONS

5.4.1 Changes Indicated by the Farmers and Extension Agents

The farmers have indicated the following changes as having been brought into the shallot farming in the Anloga area as a result of the use of the innovations;

1. Increasing yield or output
2. Expansion or increase in the number of farm needs cultivated
3. Effective control of insect pests
4. Saving in time and labour

5. Deterioration in seed bulbs

6 Increasing dependence on chemical fertilizers

The extension agents also have observed that the innovations brought changes into the shallot farming in the study area. According to them, these changes are:

1. Increased production (Output)

2. Effective pest control

3. Readiness/willingness to use other innovations

4. Longer storage life of seed bulbs

5. Reduced wastage of chemicals

The findings thus show that both the respondent farmers and the extension agents have made similar observations regarding productivity, pest control and storage of seed bulbs. The overall changes as observed by the respondent farmers and the extension agents could be grouped under the desirable and undesirable changes or consequences categories. The desirable changes are:

1. Increasing yield or output

2. Increase in number of beds cultivated

3. Effective control of pests

4. Savings in time and labour

6. Longer storage life of seed bulbs

The changes which could be classified as undesirable or negative changes are

1. Deterioration in soil condition

2. Spoilage/deterioration of seed bulbs in storage

3. Increasing dependence on chemical fertilizers.

(The farmers stated that formerly they were using a lot more organic manures like cowdung, bat dropping and even dried fish (anchovies) but now they use large amounts of expensive artificial fertilizers in their farming). This findings generally confirm the assertion of MacDonald (1976) that the introduction of an innovation tends to provoke changes in the social unit into which it is introduced and that these changes may be felt in other sectors of the unit's social life.

5.4.2 **Personal Changes**

The results further show that the individual respondent farmers have also experienced a number of changes as a result of the use of the innovations. Prominent among these are:

1. Increased income from increased output
2. Ability to meet social and family obligations
3. Acquisition of some personal properties
4. Ability to pay children's school fees regularly

The personal changes enjoyed by the respondent farmers as a result of the use of the innovations also give the indication that the innovations have brought some degree of improvement in the standard of living of the respondent farmers. This is in agreement with the findings of Hilton (1961) that a change in technology that is adoption of an innovation, results in changes in economic conditions, social organizations or human attitudes and these may serve to provoke a chain reaction throughout a whole socio economic structure. Thus the increased income, the farmers derived from increased output has made it possible for them to play other socio-economic roles and to satisfy certain personal needs like acquisition of personal properties and providing the basic needs of the family. This further supports the observation of Nuhu (1976) that the adoption of an innovation is one of the

fundamental ways by which people are able to improve their social and economic conditions. That is, the better or improved returns that people derive as a result of the adoption of certain innovations, enable them to adapt to certain socio economic changes that take place around them.

According to the extension agents, they have observed that most of the farmers they worked with were ready or willing to adopt and use other innovations introduced to them. This suggests an attitudinal change on the part of the farmers to whom innovations have been introduced. This findings is in agreement with the observation of Williams (1968) that extension education for practicing and functional farmers should effect changes not only in the skills and knowledge base but also in the attitudes of the learners (farmers).

5.4.3 **Changes Attributable to Extension Activities**

Though the farmers and the extension agents have indicated that the innovations introduced, brought changes in the shallot farming in the study area, and even personal changes to the farmers, majority of the farmers would not attribute these changes to extension activities. The results show that 79.2% of the other farmers and 37.5% of the extension follower farmers all representing 58.3% of the sampled farmers would not attribute the changes to extension activities. This finding is significant if viewed from the background that the farmers have earlier indicated that the innovations were not introduced to them only by the extension agents directly but also by farmer friends from whom the majority of the respondents stated they were introduced to the innovations. Even sellers of farm inputs were also given as one of the sources from which innovations were introduced to the respondents . As such it is very fair that the extension agents should not take all the credit for the changes observed in the shallot farming in the Anloga area. Nevertheless a good number of (55.2%) of the extension

follower farmer attributed increasing output/yield, effective pest control and cultivation of more farm beds to extension activities.

On the other hand, the findings show that while 69.8% of the extension follower farmers agreed that extension activities in the study area have contributed to improvements in shallot farming in the study area, 30.2% disagreed. Also 27.1% of the other farmers agreed that extension activities have contributed to improvements in the shallot farming with 71.9% of the other farmers disagreeing. Generally therefore, while about 51.6% of the sampled farmers disagreed that extension activities have contributed to improvements in the shallot farming, 48.4% of the sampled farmers agreed that extension activities have contributed to the improvements. Though this difference in the farmers assessment of extension's contribution to improvement in shallot farming may be not be high, it is evident that a simple majority (51.6%) of the sampled farmers would not agree that extension activities have brought improvement to their shallot farming. Likewise, a simple majority (58.3%) of the farmers would not attribute any of the changes occuring in shallot farming in the study area to extension activities.

The reasons given by the respondent farmers who disagreed that extension activities have contributed to improvements in the shallot farming in Anloga were that the agents did not visit them and as such did not teach them anything. In addition to this, the others stated that the extension agents did not give them loans. To some extent, this findings seem to give an indication of the roles the respondent farmers' expected of the extension agents vis-a-vis their role performance in their work among the farmers. That is the farmers seem to expect educational and service functions or roles from the extension agents. This finding partially agrees with that of Akinbode (1971) that the farmers of the

then Western State of Nigeria wanted both service and educational functions from the extension officers, only that they wanted more of service functions than educational functions.

5.4.4 Problems Limiting Extension Work in the Study Area

The results show that the extension agents faced a number of problems in their work in the study area. These problems according to the extension agent include.

1. unavailability of materials for demonstrations
2. the scattered nature of farm holdings
3. farmers' access to other sources of farm inputs and conservatism of farmers
4. lack of production recommendation on shallot farming and
5. understaffing

Though each of these problems was given by only one or two agents, three of the problems seem to be quite formidable. These are

1. unavailability of teaching materials for demonstrations
2. lack of production recommendations and
3. understaffing.

Where workers lack the necessary basic tools and materials with which to work, morale is always said to be low and performance adversely affected. This coupled with the problem of understaffing might result in low coverage of farmers by the extension agents, no doubt the agents in the study area were only able to make relatively few contacts with farmers who did not belong to the extension contact groups. On the other hand , since a third of the agents said they lacked production (extension) recommendation on shallot, what would they extend to the farmers?

CHAPTER SIX

6.0 SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

6.0 SUMMARY

This study attempted to look at the innovations introduced into the shallot farming in the Anloga area in the last fifteen years with the view to determine the effects of extension activities in the area. An integral part of the study thus involves the determination of what the farmers and the extension agents regard as innovations and the type of such innovations introduced into the shallot farming, the sources from which such innovations were introduced to the farmers, the methods used in introducing the innovations, the sources of information about the innovations and the changes the innovations have brought to the shallot farming in the Anloga area.

The following objectives were therefore defined for the study:

1. To find out from the farmers what they consider as innovation in their shallot farming
2. To identify the types of innovations or improved practices that have been introduced into the shallot farming over the last fifteen years
3. To identify the kinds of advice shallot farmers received from the extension agents
4. To identify the sources of the innovations that have been introduced
5. To determine the sources of information about the innovation
6. To identify the methods used in the introduction of the innovations to the farmers
7. To determine the appropriateness of the innovations and advice introduced and

8. To find out the results or changes that the innovations and advice have brought to the shallot farmers in the Anloga area

Data were collected from 192 sampled shallot farmers made up of equal numbers of both extension follower and other farmers, and the six (6) agricultural extension workers in study area with structured questionnaires administered to the respondents in interviews. This information was used to address the three (3) main concerns of the study. The first concern being what the shallot farmers and extension agents consider as innovations in the shallot farming and extension activities. The second concern was the extension method used in introducing the innovations to the respondents and the sources from which information about the innovations was delivered to the farmers. The last area of concern was to determine those changes that were brought to the farmers as a result of the use of the innovations.

Analysis of the data was limited to percentage frequency distributions and cross tabulations. Since this study was basically exploratory and thus descriptive by nature, qualitative analysis using descriptive statistics was thought appropriate for achieving the objectives of the study.

It is hoped that the findings of this study would aid planners and administrators of agricultural extension activities in understanding how technologies or improved practices meant for improving a typical local farming system could be delivered; and which sources of information could be best used to reach farmers and what combinations of teaching methods to use to make extension messages more acceptable to the recipients or target populations. Finally it is hoped that this study would provide some insight into constraints to effective extension activities among farmers who engage in the cultivation of what might be regarded as non traditional food crops including vegetables in Ghana and therefore help in finding solutions to such constraints.

6.1 SUMMARY OF RESULTS

This section would present a summary of the findings of the study and is divided into three (3) sections in line with the main areas of concern of the study namely;

1. Innovations
   - i) Meaning and types
   - ii) Sources of innovations and information on farm matters
   - iii) Rating of innovations
2. Extension teaching methods and information delivery
   - i) Methods used in introducing innovations
   - ii) Rating of extension methods
   - iii) Methods of information acquisition
   - iv) Nature of information flow/delivery about the innovations
   - v) Rating of information sources
3. Changes or outcomes of innovations
   - i) Change or outcomes brought by innovations
   - ii) Contribution of extension activities to improvement and changes in shallot farming

6.1.1 INNOVATIONS

6.1.1.1 Meaning and types of innovations

As regards the meaning of an innovation, it was found out that both the respondent shallot farmers in the Anloga area and the extension agents have the same if not a common understanding of what it is that is new methods, techniques and things which farmers were not using formerly but now use in the farming. They gave examples or types of such innovations as chemical fertilizers, pesticides (insecticides) knapsack spraying machines, use of water pumps for irrigation, onion cultivation, seed bulb treatment for storage, reduced/ zero stirring etc. In addition to these, the extension agents on their part mentioned line/row planting, use of quarantine clearance certificate, use of herbicides, mulching and green manuring as the kinds of innovations they have introduced in the study area. Majority of the respondent farmers stated that they did not receive any advice on improving their shallot farming from extension agents. In instances where advice was given at all, it was limited to only the use of chemical fertilizers and insecticides.

6.1.1.2 Sources of innovations and information on farm matters

The study has revealed that the innovations were introduced to the farmers mainly by farmer friends, extension agents and sellers of farm inputs. Non-Governmental Organizations and mass media sources were not so much involved in the introduction of innovations to the shallot farmers in the Anloga area. For sources of information on farm matters, the study found that majority of the farmers received or got information on farming matters from farmer friends.

6.1.1.3 Rating of innovations

The study has shown that the innovations introduced to the respondent shallot farmers are generally appropriate to them. The appropriateness of the innovations was based on the respondent farmers' own rating of the innovations and the assessment of the innovations by the extension agents. Also majority of the respondent farmers stated that they derived a lot of benefits from the innovations and hence the majority of the sampled farmers continued using the innovations. In other words because nearly all the innovations gave the farmers much benefits, very few of the sampled farmers discontinued using some of the innovations. Even those who discontinued, did so not because of the inappropriateness of the innovations but mostly because of the non availability of the particular innovation.

6.1.2 Extension Teaching Methods and Information Delivery

6.1.2.1 Methods used in introducing innovations

The study found out that the innovations were introduced to the majority of the respondents through lecture (verbal explanation) by farmer friends and by demonstration (observing the examples) by farmer friends. Few respondent farmers also mentioned lecture (verbal explanations) by the extension agents and sellers of farm inputs, and demonstrations of the extension agents as the methods by which they learnt how to use the innovations. The extension agents themselves mentioned farmers' meetings, rallies, group discussions and lecture as the methods by which they introduced or taught the innovations to the farmers. The respondents did not however include these methods in their list of methods.

6.1.2.2 **Rating of extension methods**

The results showed that there was a high preference among the respondent farmers for the lecture (verbal explanations) and `demonstrations' used by farmer friends in introducing the innovations than for lecture (verbal explanation) and demonstrations of the extension agents. Most of the sampled farmers rated lecture (verbal explanations) by farmer friends and watching/observation of their farmer friends as appropriate to them than they did for verbal explanation and demonstrations of the extension agent.

6.1.2.3 **Method of information acquisition**

The study further revealed that the majority of the respondent farmers got information about the innovations generally through discussion and conversation with farmer friends. Some of them also had the information through the visit of the extension agent to them either in the farm or at home. The study also shows that information acquisition about innovations from publications and other mass media sources was not prominent in the study area though a good number of the respondents have had some formal education.

6.1.2.4 **Nature of information delivery/flow**

On the nature of information flow or delivery from the sources, the study found out that a great majority of the respondent farmers readily and continuously received information about innovations and farming matter from farmer friends and relatives. The study also showed that information about

the innovations from the other source like extension agents and sellers of farm inputs, was not readily available to most of the farmers.

6.1.2.5 Rating of information sources

The study further found that majority of the farmers rated farmer friends as more important source of information about innovation to them than the extension agents and sellers of farm inputs. They however rated extension agents as more important source than the sellers of farm inputs.

6.1.3 Changes or Outcomes of Innovations

6.1.3.1 Changes or outcomes brought by innovations

Both the respondent farmers and the extension agents in this study, agreed that the innovations introduced, have brought changes or benefits to the shallot farming in the Anloga area

These changes include

1. Increasing yield or output
2. Increase in number of farm beds cultivated
3. Effective pest control
4. Saving in time and labour
5. Longer storage of seed bulbs etc, all which could be regarded as desirable changes.

Other changes such as over dependence on chemical fertilizers and spoilage of seed bulbs etc which were also brought in as a result of the introduction of the innovations were also indicated by the respondents and could be regarded as undesirable changes or outcomes.

The study also found out that the individual respondent farmers also experienced a number of non farm changes. Among these are

1. Increased income from increased yield
2. Ability to meet social and family obligations
3. Acquisition of some personal properties and

6.1.3.2 Contribution of extension activities to improvement and changes in shallot farming

Though about 69.8% of the extension follower farmers agreed that extension activities in the study area contributed to improvement in shallot farming, 72.9% of the other farmers disagreed. The findings showed that about 51.6% of the sampled farmers on the whole disagreed that extension activities have contributed to improvements in the shallot farming. That is a little over half of the sampled farmers would not agree that the activities of the extension agents have contributed to the improvement in the shallot farming. Also though a number of changes have been indicated in the study to have occurred in the shallot farming in the Anloga area, majority of the respondents would not attribute all of them to extension activities.

6.2 CONCLUSIONS

This section would try to enumerate the conclusions derived from the study based upon the findings mentioned above. These conclusions would be presented under the headings of:-

1. Innovations
2. Teaching methods used and information delivery

3. Changes or results of the adoption of innovations

6.2.1 Innovations

1. The study showed that the sampled farmers and the extension agents have a common understanding for what innovations are. That is they consider innovations as new techniques, methods and things which farmers were not using before in their farming and which help them to improve their production.
2. Items such as artificial fertilizers, insecticides, Knapsack sprayers, use of water pumps for upland cultivation of shallot, onion cultivation, reduced/zero stirring etc were considered by the farmers as innovations introduced into shallot farming over the last fifteen (15) years.
3. The extension agents also tried to introduce innovations like line planting, use of quarantine clearance for introducing seed bulbs from Agou in the Republic of Togo, use of herbicides, mulching and green manuring,
4. Most of the sampled farmers did not receive much advice on improving their shallot farming from extension services.
5. Where advice was given it was mainly limited to the use of chemical fertilizers and use of agro-chemicals to the neglect of other aspects of farming like cultural practices, new varieties, and marketing.
6. Extension contact among the sampled farmers was quite fairly good though the agents did not offer much by way of advice to the farmers for improving shallot farming.

7. The extension agents lacked or did not have the requisite production or extension recommendations particularly on shallot which they could conveniently extend to the farmers in the study area.
8. The sampled farmers relied mainly on farmer friends as source of innovation and of information about innovations in their farming.
9. Non-Governmental Organizations were not so much involved in agricultural extension in the study area.
10. Mass media sources including publications and radio broadcasts were not used in informing the farmers and in dissemination of innovations to the farmers.
11. Almost all the innovations introduced and used by the farmers were considered by the sample farmers as appropriate to them.

6.2.2 Teaching Methods and Information Delivery

1. Lecture (verbal explanations) and discussions were used mainly by farmer friends in introducing the innovations or teaching their colleagues about the innovations. In addition to this method, the learner farmers watched or observed the examples ('demonstration') of their farmer friends using the innovations they (learners) are interested in.
2. Those farmers who learnt about the innovations from the extension agents were taught through lecture (verbal explanations) and demonstrations by the extension agents.
3. The sellers of farm inputs too used verbal explanation in introducing the innovations to their customer farmers.

4. Though extension agents used other methods like rallies, lecture, demonstrations, visits and group discussions, they most often used the latter two methods.
5. It was concluded that since the majority of the respondent farmers acquired or got information on farming matters and about innovations through discussion and conversation with farmer friends, interpersonal communication among the farmers was quite high.
6. Group methods were not effectively used by the extension agent in reaching out to the farmers with innovations and information about the innovations.

6.2.3 **Changes brought by the Innovations**

Concerning the changes or consequences that were brought by the introduction and adoption of the innovations in the shallot farming in the Anloga area, the following conclusions were made

1. The innovations have definitely brought changes and improvement in the shallot farming and to the individual shallot farmers who used them. Some of these changes are increased production leading to increased incomes from farming, good pest control, and acquisition of some personal properties.
2. However the majority of the sampled farmers did not attribute the changes and improvements occurring in the shallot farming to extension activities in the study area.

6.3 RECOMMENDATIONS

The following recommendations are made based upon the findings of this study which may be very useful to various organizations and individuals who are involved and interested in helping farmers to help themselves.

1. The results show that very few farmers acquire information about innovations at farmers' or group meetings though the extension agents mentioned that group meetings was one of their most often used methods in informing the farmers. This seems to suggest that either the farmers did not attend the group meetings or that the group meetings were not properly oriented or organised for extension teaching purposes. It is therefore recommended that the agents in the study area strive to form functional groups of farmers like farmers' cooperatives with which they could work.
2. Feaster (1968) observed that unavailability of technically superior farm practices for local conditions is one of the reasons that militate against the acceptance and use of innovations in the agricultural sector. The same factor have been identified by this study. It is therefore advocated that local farm research should be conducted by the Faculties of Agriculture in the universities in the country and by the Crops Research Institute on the cultivation of other non traditional food crops and vegetables including shallot, to generate or produce production recommendations which could be extended to the farmers, through the Extension Division of the MOFA.
3. It is further recommended that extension frontline staff posted to or working in a particular area, should be trained in the cultivation of the crops peculiar to the area. Armed with research findings or production recommendations and experience gained

from local training, they would be in a better position to help farmers to improve the cultivation of the particular crops.

4. The study shows that there was good interpersonal communication among the farmers. This could be attributed to the frequent interaction between farmers as they work on farm beds because of the closeness of the farm belt to one another. It is therefore recomended that the extension agents should also intensify individual contact with farmers who in turn would spread the messages to their farmer friends.

5. The results show that most of the farmers did not approach (visit) the extension agents to discuss problems with them. It is therefore suggested that extension agents should encourage the farmers to appraoch them freely and not to shy away from them. This they could do by interacting with the farmers frequently through farm and home visits. The extension agents should also involve the farmers in planning programmes that are designed to help the farmers.

6. One conclusion drawn from this study is that some aspects of the shallot farming are not adequately covered or catered for by way of innovations eg. cultural practices, marketing, the issue of the introduction of new seed stock etc. It is therefore recommended that the Crops Research Institute looks into the issue of cultural practices and breeding or development of seed stocks to be recommended and disseminated to the farmers, while issues concerning new marketing strategies or arrangements could be formulated and streamlined by farmer cooperatives and local market associations.

7. One major conclusion from this study is that majority of the farmers rely on their farmer friends and relatives for information about innovations and even to be taught how to use innovations. It is therefore recommended that extension agents should use local farmers more in their teaching activities especially in their demonstrations. Such demonstrations could be organised or held on farmers' plots or beds. Also more local tours to other farmers' farms could be organised for the farmers.

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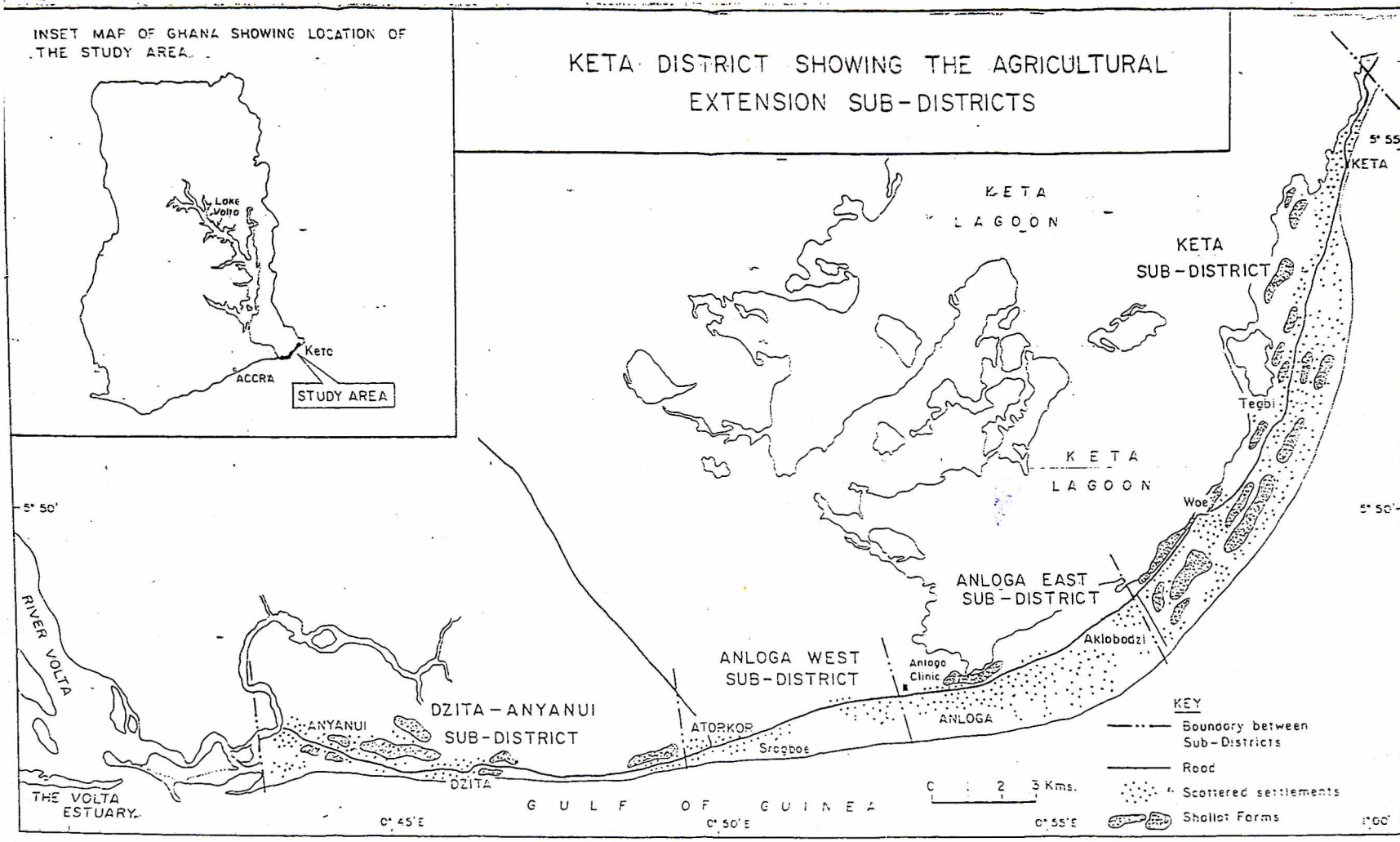

SURVEY OF GHANA — 1: 50,000 Sheet No. 0500 B2

APPENDIX II

TITLE OF STUDY
THE EFFECTS OF EXTENSION SERVICES ON THE SHALLOT FARMING IN THE ANLO AREA WITH RESPECT TO THE ADOPTION OF INNOVATIONS QUESTIONNAIRE (EXTENSION AGENT RESPONDENTS)

This questionnaire aims at studying extension activities in your community/Local with regards to innovations introduced into the shallot farming. I would be most grateful if you could answer the questions below:

Any information given will be treated confidential. Please be specific and answer the questions as accurately as possible.

Thank you.

Date..... Town/Village..... Questionnare No.....

In your opinion, what do you consider a farm innovation

1. (Briefly explain).....

.....

.....

2. What farm innovations have you (extension) promoted to the shallot farmers in the last 15 years ie. during the period of Voradep and after? (Please list them)

.....

13. Please give reasons why you use a particular method most often?

.....

.....

14. What problems, in your opinion limit your work as an extension agent in the introduction of innovations? (Briefly list the problems)?

.....

.....

.....

15. What do you do to solve the problem?

.....

.....

.....

16. Have the innovations introduced to the shallot farmers over the last 15 years, brought any changes in shallot farming?

1. Yes [ ] 2. No [ ]

17. If no, why have the innovations failed to produce any change?

.....

.....

.....

18. If yes, what changes are brought by the innovations generally to the shallot farming?.....

.....

.....

19. For any 4 of the innovations that you have introduced, indicate how each has benefited the shallot farmers?

INNOVATION	BENEFIT TO THE FARMER
.....	.....
.....	.....
.....	.....
.....	.....

Thank you

APPENDIX III

TITLE OF STUDY

THE EFFECTS OF EXTENSION SERVICES ON THE SHALLOT FARMING IN THE ANLO AREA WITH RESPECT TO THE ADOPTION OF INNOVATIONS QUESTIONNAIRE (FARMER RESPONDENTS)

This questionnaire aims at studying extension activities in your community/Locality with regards to innovations introduced into your farming. I would be most grateful if you could answer the questions below:

Any information given will be treated confidential. Please be specific and answer the questions as accurately as possible.

Thank you.

Date..... Town/Village..... Questionnaire No.....

INNOVATIONS

1. Have you ever had any contact with agricultural extension agents in your locality?

   1. Yes [ ] 2. No. [ ]

2. If yes when did you first come into contact with him/her?

   .....

   .....

   .....

3. How did you come into contact with the agents?

   .....

.....

.....

4. What have you learnt from him since the contact?

.....

.....

.....

5. What things would you consider as innovations introduced into the shallot farming over the last 15 years?. (Please specify)

.....

.....

.....

6. Why do you consider them as innovations?

.....

.....

.....

7. List the innovations and indicate the source from which each was introduced to you in the table below.

Innovation	Source
.....	.....
.....	.....
.....	.....

8. In which aspects of the shallot farming have innovations been introduced?

.....

.....

9. Indicate the nature of information delivery about innovations from the sources listed in Question 7, (Please check your responses from the table below).

	Nature of Information Delivery	
(a) Source	Readily Available	Not Readily Available
(b) Source	Continuously	Occasionally

10. How do you get information about innovation from the sources listed in Question 7?

Source	Method of Information Delivery

11. Which of the innovations in Q.7 have you used before?

(Please specify).....

.....

12. Which of the innovation listed (in Q.11) are you still using?

.....

.....

13. Why have you stopped using some of the innovations you have used before?

(Please give reasons for stopping using them).

Innovation	Reason for stopping the use
.....	.....
.....	.....
.....	.....

14. From those innovations (listed in Q12) - that you are still using - pick any 4, that give you most benefit. .....

.....

.....

.....

15. For each innovation picked (in Q.14) please indicate the benefit derived (Tabulate your response as follow).

Innovation	Benefit
.....	.....
.....	.....
.....	.....

16. How are the innovations introduced contributing to the improvement in your shallot farming? .....

.....

17. Do you receive any advice on ways of improving your shallot farming from Extension?

1. Yes [ ] 2. No. [ ]

18. If yes, briefly indicate the kind of advice given?

.....

.....

19. How will you rate the innovations/advice introduced into the shallot farming over the last 15 years? (Please list the innovations/advice (as in Q.5 and 18) and indicate your rating by ticking the relevant column).

	RATING		
Innovation	Appropriate	Inappropriate	Indifferent

Information Delivery/Extension Teaching Methods

20. From which sources do you get information on matters concerning your shallot farming? (Please tick those sources that are applicable to you. More than one answer is possible).

1. From other farmers/Friends - [ ]
2. From people selling agric inputs - [ ]
3. From extension agents in the area - [ ]
6. Others (please specify).....

.....

.....

21. Please rate your sources of farm information in the order of importance by ticking the appropriate column against the information source.

Information source	Most Important	Important	Least Important	Not Important
Other farmers/Friends				
People selling agric inputs				
Extension agents				
Others:				

22. Through what teaching methods are the innovations introduced to?

.....

.....

.....

23. How will you rate the methods used in introducing/promoting the innovations in your locality? (Please list the methods (as in (22) and indicate your rating by ticking the relevant column).

Teaching Method	Appropriate	Inappropriate	Indifferent

OUTCOMES

24. What changes have occurred in your shallot farming over the last 15 years? (Briefly describe the changes)

.....

.....

.....

25. Which of these changes will you attribute to extension activities in your locality? (Please specify the changes).

26. In your opinion have the extension activities contributed to improvement in the shallot industry generally?

I. Yes [ ] No [ ]

27. If yes, in what ways has extension contributed to the improvement in the shallot industry? (Please specificy).....

.....

.....

28. If no, why do you think that the extension activities have not contributed to improvement in the shallot industry?

.....

.....

29. Briefly indicate the changes that you have observed in the following areas as a result of the introduction of innovations in your farming?

AREAS	Changes that have occurred
a) You as a person	.....
b) Family life	.....
c) Others (specify)	.....

DEMOGRAPHIC RECORD

31. (Check which age group is applicable to you)

Age: Below 18 years [ ]

18-25 years [ ]

26-33 [ ]

34-41 [ ]

42-49 [ ]

50-59 [ ]

above 57 years [ ]

32. Sex: Male [ ] Female [ ]

33. What is your educational level?

1. J.S.S. [ ]
2. S.S.S. [ ]
3. Secondary School [ ]
4. Middle School [ ]
5. Up to Primary 6 [ ]
6. NIL [ ]
7. Others please specify.....

.....

34. How many shallot beds do you cultivate a season?

1. Below 20 beds [ ]

2. 20-50 beds [ ]

3. Above 50 beds [ ]

35. How did you acquire your farm land/beds?

(More than one response is possible)

1. By inheritance from parents [ ]

2. By mortgage [ ]

3. By renting [ ]

4. By lease [ ]

5. Others (please specify).....

.....

36. How does the ownership right you have over the beds you cultivate influence you in your decision to adopt the innovations?

Ownership Right	Influence on decision to adopt innovations
.....	.....
.....	.....
.....	.....
.....	.....

37. Do you have any other occupation in addition to farming?

1. Yes [ ] 2. No. [ ]

38. If yes, please state the additional occupation.

.....

.....

40. Does your additional occupation help you in any way in the adoption of innovations?

1. Yes [ ] 2. No [ ]

41. If yes, please briefly state how it helps you in the adoption of innovations?

.....

.....

.....

Thank you.